STARDaki Toolkit

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PART I Systematic review

Literature retrieving

Table S 1 Literature search strategy and history in PubMed.

No.	Query	Results
5	(#1 OR #2) AND (#3 OR #4)	3,852
4	"area under curve"[Title/Abstract] OR "Area Under Curves"[Title/Abstract] OR "area under the curve"[Title/Abstract] OR "hierarchical summary receiver operating characteristic"[Title/Abstract] OR "HSROC"[Title/Abstract] OR "receiver operating characteristic"[Title/Abstract] OR "receiver operating characteristic curve"[Title/Abstract] OR "receiver operating characteristics"[Title/Abstract] OR "ROC Analyses"[Title/Abstract] OR "ROC analysis"[Title/Abstract] OR "ROC curve"[Title/Abstract] OR "ROC Curves"[Title/Abstract] OR "ROC plot"[Title/Abstract] OR "specificity"[Title/Abstract] OR "SROC"[Title/Abstract] OR "summary receiver operating characteristic"[Title/Abstract]	745,857
3	(ROC Curve[MeSH Terms]) OR (Area Under Curve[MeSH Terms])	109,016
2	"Acute Kidney Failure"[Title/Abstract] OR "Acute Kidney Failures"[Title/Abstract] OR "Acute Kidney Injuries"[Title/Abstract] OR "Acute Kidney Injury"[Title/Abstract] OR "Acute Kidney Insufficiencies"[Title/Abstract] OR "Acute Kidney Insufficiency"[Title/Abstract] OR "Acute Renal Failure"[Title/Abstract] OR "Acute Renal Failures"[Title/Abstract] OR "Acute Renal Injuries"[Title/Abstract] OR "Acute Renal Injury"[Title/Abstract] OR "Acute Renal Insufficiencies"[Title/Abstract] OR "Acute Renal Insufficiency"[Title/Abstract] OR "kidney acute failure"[Title/Abstract]	71,341
1	Acute Kidney Injury[MeSH Terms]	59,175

Table S 2 Literature search strategy and history in Embase.

No.	Query	Results
#6	#5 AND 'Article'/it	5180
#5	(#1 OR #2) AND (#3 OR #4)	7863
#4	'receiver operating characteristic'/exp OR 'area under the curve'/exp	399307
#3	'area under curve':ti,ab,kw OR 'area under curves':ti,ab,kw OR 'area under the curve':ti,ab,kw OR 'hierarchical summary receiver operating characteristic':ti,ab,kw OR 'hsroc':ti,ab,kw OR 'receiver operating characteristic':ti,ab,kw OR 'receiver operating characteristic curve':ti,ab,kw OR 'receiver operating characteristics':ti,ab,kw OR 'roc analyses':ti,ab,kw OR 'roc analysis':ti,ab,kw OR 'roc curve':ti,ab,kw OR 'roc curves':ti,ab,kw OR 'roc plot':ti,ab,kw OR 'specificity':ti,ab,kw OR 'sroc':ti,ab,kw OR 'summary receiver operating characteristic':ti,ab,kw	991934
#2	'acute kidney failure'/exp	138480

Table S 3 Literature search strategy and history in Web of Seience.

No.	Query	Results
1	TS=(“Acute Kidney Failure” OR “Acute Kidney Failures” OR “Acute Kidney Injuries” OR “Acute Kidney Injury” OR “Acute Kidney Insufficiencies” OR “Acute Kidney Insufficiency” OR “Acute Renal Failure” OR “Acute Renal Failures” OR “Acute Renal Injuries” OR “Acute Renal Injury” OR “Acute Renal Insufficiencies” OR “Acute Renal Insufficiency” OR “kidney acute failure”)	81055
2	TS=(“area under curve” OR “Area Under Curves” OR “area under the curve” OR “hierarchical summary receiver operating characteristic” OR “HSROC” OR “receiver operating characteristic” OR “receiver operating characteristic curve” OR “receiver operating characteristics” OR “ROC Analyses” OR “ROC analysis” OR “ROC curve” OR “ROC Curves” OR “ROC plot” OR “specificity” OR “SROC” OR “summary receiver operating characteristic”)	857903
3	#1 AND #2	3718

Table S 4 Literature search strategy and history in Cochrane Library.

No.	Query	Results
#1	(“Acute Kidney Failure” OR “Acute Kidney Failures” OR “Acute Kidney Injuries” OR “Acute Kidney Injury” OR “Acute Kidney Insufficiencies” OR “Acute Kidney Insufficiency” OR “Acute Renal Failure” OR “Acute Renal Failures” OR “Acute Renal Injuries” OR “Acute Renal Injury” OR “Acute Renal Insufficiencies” OR “Acute Renal Insufficiency” OR “kidney acute failure”):ti,ab,kw	7383
#2	MeSH descriptor: [Acute Kidney Injury] explode all trees	2422
#3	(“area under curve” OR “Area Under Curves” OR “area under the curve” OR “hierarchical summary receiver operating characteristic” OR “HSROC” OR “receiver operating characteristic” OR “receiver operating characteristic curve” OR “receiver operating characteristics” OR “ROC Analyses” OR “ROC analysis” OR “ROC curve” OR “ROC Curves” OR “ROC plot” OR “specificity” OR “SROC” OR “summary receiver operating characteristic”):ti,ab,kw	55895
#4	MeSH descriptor: [Area Under Curve] explode all trees	9063
#5	MeSH descriptor: [ROC Curve] explode all trees	2178
#6	(#1 OR #2) AND (#3 OR #4 OR #5)	307

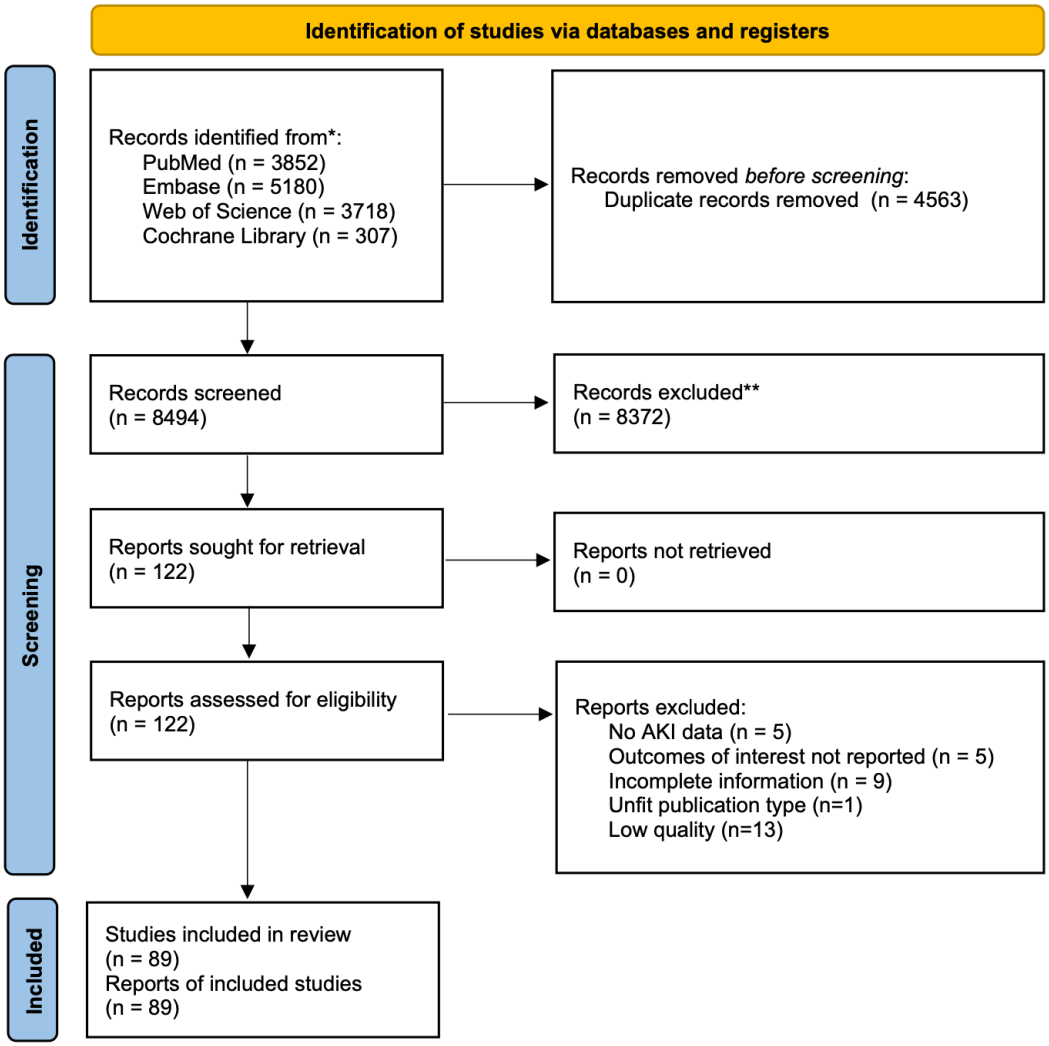


Figure S 1 PRISMA flowchart of literature retrieving.

Quality Assessment

Introduction of QUADAS-2

QUADAS-2 is specifically designed to evaluate the quality of studies on diagnostic accuracy. It aids in assessing the risk of bias and the applicability of the research findings to the recommendation. Four major domains in QUADAS-2 are: 1) Patient selection, which evaluates the methods of patient selection to identify any biases affecting the generalizability of the study outcomes. 2) Index Test to assess if the biomarker test was conducted and interpreted without knowledge of the reference standard's outcomes. 3) Reference standard to examine the accuracy of the reference standard used in determining AKI. And 4) Flow and timing to investigate the integration of the index test and reference standard and the timing of their administration to ensure relevance to the recommendation.

The GRADE system is utilized to grade the strength of the evidence and recommendations. It considers study design, consistency of results, and directness of evidence. Four levels of evidence are: 1) High indicates a very high level of confidence that the true effect lies close to that of the estimate of the effect. 2) Moderate alludes to moderate confidence levels in the effect estimate; the true effect is likely to be close to the estimate, but there is a possibility that it is substantially different. 3) Low outlines limited confidence in the effect estimate; the true effect may be substantially different from the estimate. And 4) Very Low indicates very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate.

The OCEBM developed a system to classify the strength of evidence from healthcare studies. In 2009, the OCEBM updated its levels of evidence to help clinicians and researchers understand the quality and reliability of medical research more effectively. The system categorizes evidence into five primary levels, ranging from high-quality evidence, like systematic reviews and meta-analyses of randomized controlled trials (RCTs), down to very low-quality evidence, such as expert opinion without explicit clinical experience or descriptive studies. This hierarchical structure aids in clinical decision-making by providing a clear framework to evaluate the strength of evidence supporting various interventions and practices in medicine. The OCEBM level of evidence rating consists of a number and a letter representing the level and type of evidence, respectively. The level is determined by the study design of the evidence source. In contrast, the evaluation of the type of evidence is rated as a for all systematic evaluations or 'a-' for type if high heterogeneity is detected in the analyzed results.

Results of QUADAS-2

Family name of the first author: Zaouter
Publication year: 2018
Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a consecutive series of patients scheduled for elective on-pump heart surgery with high-risk factors for CSA-AKI. Exclusion criteria were reasonable and did not appear to introduce significant bias.
Index test	Low	The urinary [TIMP-2]·[IGFBP7] and RRI tests were performed in a blinded fashion without knowledge of the KDIGO criteria outcomes. The thresholds for the urinary [TIMP-2]·[IGFBP7] test were pre-specified.
Reference standard	Low	The KDIGO criteria for AKI were used as the reference standard and were applied in a blinded manner without knowledge of the index test results.
Flow and Timing	Low	There was an appropriate interval between the index tests (urinary [TIMP-2]·[IGFBP7] and RRI) and the reference standard (KDIGO criteria). All patients received the reference standard and were included in the analysis.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population consisted of patients at high risk for CSA-AKI undergoing elective on-pump heart surgery, which is relevant to the target population.
Index test	Low	The urinary [TIMP-2]·[IGFBP7] test and RRI were performed using standardized methods and in a blinded fashion, which enhances the applicability of the test results.
Reference standard	Low	The KDIGO criteria for AKI are widely accepted and used in clinical practice, making the reference standard applicable to the intended clinical setting.

Family name of the first author: Khreba

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Continuous enrollment of patients and inclusion of those with cardiac disease developing AKI.
Index test	Low	Urinary KIM-1 measurement blinded to clinical information.
Reference standard	Low	KDIGO criteria for AKI diagnosis used as a reference standard.
Flow and Timing	Low	Adequate interval between index test and reference standard with all patients receiving both tests.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	Study population includes only patients undergoing open-heart surgery with CPB, which might limit generalizability.
Index test	Low	Urinary KIM-1 measured in a consistent manner using ELISA kits.
Reference standard	Low	KDIGO criteria provide a robust and commonly accepted method for diagnosing AKI.

Family name of the first author: Aydogdu

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Unclear	The study included patients older than 18 without known previous renal disease, but the process of continuous enrolment was not explicitly stated.
Index test	Low	Urine and plasma NGAL and Cystatin C were measured without knowledge of the clinical outcomes, ensuring blinding.
Reference standard	Low	AKI was defined according to RIFLE criteria, a widely accepted standard for diagnosing AKI.
Flow and Timing	Unclear	There is no clear indication of the timing between the index test and the reference standard in relation to the development of AKI.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a broad spectrum of ICU patients with sepsis, reflecting real-world clinical scenarios.
Index test	Low	The methods for measuring NGAL and Cystatin C were standardized and used in a clinically relevant manner.
Reference standard	Low	The use of RIFLE criteria for defining AKI provides a clear and applicable reference standard.

Family name of the first author: Adler

Publication year: 2018

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled consecutively, and the study included a representative sample of OHCA patients.
Index test	Low	Biomarker [TIMP-2]·[IGFBP7] was measured without knowledge of clinical outcomes.
Reference standard	Low	AKI was diagnosed according to KDIGO criteria, a recognized standard for diagnosing AKI.
Flow and Timing	Low	Samples were collected at fixed intervals (3 and 24 hours post-OHCA) relative to the reference standard.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study focused on a specific high-risk group of OHCA patients, which reflects the intended clinical application.
Index test	Low	The [TIMP-2]·[IGFBP7] biomarker test was performed uniformly across all patients.
Reference standard	Low	KDIGO criteria are widely accepted for the diagnosis of AKI, making the reference standard applicable.

Family name of the first author: Chang

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were recruited continuously and included those presenting with any comorbidities and kidney stressors.
Index test	Low	Urinary NGAL and calprotectin were measured in a blinded fashion relative to the clinical outcomes.
Reference standard	Low	AKI was defined according to the Kidney Disease Improving Global Outcomes (KDIGO) classification.
Flow and Timing	Low	Urine samples were collected prospectively and the reference standard applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients from a coronary care unit setting, which is relevant for the clinical question.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the applicability of the results.
Reference standard	Low	KDIGO classification is a widely accepted standard for diagnosing AKI, supporting the reference standard's applicability.

Family name of the first author: Chen

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were recruited consecutively from the CCU, providing a representative sample.
Index test	Low	Biomarkers (NGAL, IL-18, CysC) were measured in a blinded manner, reducing potential bias.
Reference standard	Low	AKI was defined using the Acute Kidney Injury Network (AKIN) criteria, a recognized standard.
Flow and Timing	Low	Urine output and SCr were measured daily starting from the first day of CCU admission.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population was drawn from a CCU, which is applicable to the clinical setting being investigated.
Index test	Low	The biomarkers were quantified using standard protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of AKIN criteria for defining AKI ensures the applicability of the reference standard.

Family name of the first author: Chen

Publication year: 2020

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled consecutively from the CCU, ensuring a representative sample.
Index test	Low	Biomarkers (NGAL, CysC, IL-18) were measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKD was defined using a well-established standard, ensuring accurate classification.
Flow and Timing	Low	Urine and blood samples were collected prospectively on the first day of CCU admission, and AKD was diagnosed appropriately.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients from a CCU setting, which is applicable to the clinical context being investigated.
Index test	Low	Biomarkers were measured using standard protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for defining AKD ensures the applicability of the reference standard.

Family name of the first author: Cho

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled prospectively over a one-year period, ensuring a representative sample.
Index test	Low	Urinary biomarkers (L-FABP and NGAL) were measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to the Acute Kidney Injury Network (AKIN) criteria, ensuring a robust reference.
Flow and Timing	Low	Urine samples were collected at ICU admission, and the reference standard was applied within 5 days.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients from medical and surgical ICUs, reflecting a diverse and realistic clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of AKIN criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Cuartero

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were recruited consecutively from ICU, ensuring a representative sample.
Index test	Low	The[TIMP-2]·[IGFBP7] index was measured using a standardized protocol, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to the Acute Kidney Injury Network (AKIN) criteria, ensuring a robust reference.
Flow and Timing	Low	Urine samples were collected at ICU admission and up to 12 hours later, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a mix of septic and non-septic patients from ICU, reflecting a diverse and realistic clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of AKIN criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Cummings

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled from a randomized controlled trial with strict inclusion and exclusion criteria, ensuring a representative sample.
Index test	Low	Urinary[TIMP-2]·[IGFBP7] was measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to the Kidney Disease Improving Global Outcomes (KDIGO) criteria, ensuring a robust reference standard.
Flow and Timing	Low	Urine samples were collected at eight perioperative time points, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing cardiac surgery, reflecting a specific and relevant clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of KDIGO criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Dusse

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled consecutively and followed a strict inclusion and exclusion criteria, ensuring a representative sample.
Index test	Low	Urinary[TIMP-2] and [IGFBP7] were measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to the Kidney Disease: Improving Global Outcomes (KDIGO) criteria, ensuring a robust reference standard.
Flow and Timing	Low	Urine samples were collected serially in the early post-interventional course, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing TAVI, reflecting a specific and relevant clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of KDIGO criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Ferguson

Publication year: 2010

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on confirmed AKI, ensuring a representative sample of those with and without AKI.
Index test	Low	Urinary L-FABP was measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed using established criteria, ensuring a robust reference standard.
Flow and Timing	Low	Urine samples were collected and analyzed at appropriate intervals relative to the reference standard.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a broad spectrum of hospitalized patients, reflecting a wide clinical applicability.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Ferrari

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled consecutively, ensuring a representative sample of the ICU population.
Index test	Low	Urinary[TIMP-2]·[IGFBP7] was measured using a standardized protocol, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to established criteria, ensuring a robust reference standard.
Flow and Timing	Low	Urine samples were collected at ICU admission, and the reference standard was applied within a specified timeframe.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients from a multidisciplinary ICU, reflecting a broad clinical applicability.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Gunnerson

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled from multiple ICUs across Europe and North America, ensuring a diverse and representative sample.
Index test	Low	Urinary[TIMP-2]·[IGFBP7] was measured using a standardized protocol, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to KDIGO criteria, ensuring a robust reference standard.
Flow and Timing	Low	Urine samples were collected at fixed intervals post-surgery, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a broad spectrum of surgical patients, reflecting a wide clinical applicability.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of KDIGO criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Haase-Fielitz

Publication year: 2009

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a representative sample of patients undergoing cardiac surgery with various degrees of AKI.
Index test	Low	Plasma NGAL was measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was defined according to established criteria, ensuring a robust reference standard.
Flow and Timing	Low	The timing of NGAL measurement relative to the development of AKI was clearly defined and consistently applied.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing cardiac surgery, reflecting a specific clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Hanson

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled based on pre-specified criteria for severe malaria, ensuring a representative sample.
Index test	Low	Laboratory indices of acute tubular necrosis and acute kidney injury were measured using standardized protocols, reducing potential bias.
Reference standard	Low	The requirement for renal replacement therapy was retrospectively assessed by three independent reviewers, ensuring a robust reference standard.
Flow and Timing	Low	Blood and urine samples were collected on study enrolment, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients with severe falciparum malaria, reflecting a specific clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of independent reviewers to determine the need for renal replacement therapy ensures the applicability of the reference standard.

Family name of the first author: Hoste

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled from multiple centers, ensuring a diverse and representative sample.
Index test	Low	Urinary[TIMP-2]·[IGFBP7] was measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed according to established criteria, ensuring a robust reference standard.
Flow and Timing	Low	Urine samples were collected at ICU admission, and the reference standard was applied within a specified timeframe.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a broad spectrum of critically ill patients, reflecting a wide clinical applicability.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Imoto

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled from a single center ICU, ensuring a representative sample of critically ill patients.
Index test	Low	Urinary NGAL and serum procalcitonin were measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed based on the KDIGO classification using elevated serum creatinine, ensuring a robust reference standard.
Flow and Timing	Low	Urine and blood samples were collected at ICU admission, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients with various critical conditions, reflecting a diverse clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of KDIGO criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Introcaso

Publication year: 2018

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were consecutively evaluated, ensuring a representative sample of the cardiac surgery population.
Index test	Low	NGAL was measured using a standardized protocol, reducing potential bias.
Reference standard	Low	AKI was defined using established criteria, ensuring a robust reference standard.
Flow and Timing	Low	Samples were collected pre-operatively and post-operatively, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing cardiac surgery, reflecting a specific clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Jahaj

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected from a critical care setting, ensuring a representative sample of critically ill patients.
Index test	Low	Serum NGAL was measured using standardized protocols, reducing potential bias.
Reference standard	Low	AKI was diagnosed using established criteria, ensuring a robust reference standard.
Flow and Timing	Low	Samples were collected at appropriate intervals, and the reference standard was applied consistently.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included critically ill patients, reflecting a specific and relevant clinical scenario.
Index test	Low	Biomarkers were measured using standardized protocols, enhancing the reliability of the measurements.
Reference standard	Low	The use of established criteria for diagnosing AKI ensures the applicability of the reference standard.

Family name of the first author: Khreba

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing cardiopulmonary bypass surgery with pre-defined inclusion criteria.
Index test	Unclear	The study does not explicitly mention if the urinary KIM-1 test results were interpreted without knowledge of the reference standard.
Reference standard	Low	The reference standard used was the KDIGO criteria for AKI, which is considered an appropriate standard.
Flow and Timing	Low	There was an appropriate interval between the index test(s) and the reference standard assessments.

Family name of the first author: Kim

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Continuous enrollment of patients with clinical suspicion of sepsis.
Index test	Unclear	No explicit statement regarding blinding of index test interpreters to reference standard results.
Reference standard	Low	KDIGO criteria used for AKI diagnosis, blinded to index test results.
Flow and Timing	Low	Adequate time frame for biomarker measurement and follow-up for AKI diagnosis.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	High	Study population includes sepsis, septic shock, and suspected sepsis cases.
Index test	Low	Standardized measurement of PENK and NGAL using established assays.
Reference standard	Low	Utilization of widely accepted KDIGO criteria for defining AKI.

Family name of the first author: Kimmel

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a consecutive sample of patients presenting to the ED with specific inclusion criteria.
Index test	Low	Urinary [TIMP-2]·[IGFBP7] was measured in a blinded fashion to clinical data.
Reference standard	Low	U-Score was determined independently and blinded to [TIMP-2]·[IGFBP7] results.
Flow and Timing	Low	There was an appropriate interval between the index test and the reference standard evaluation.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population was representative of ED patients suspected of AKI, aligning with the research question.
Index test	Low	The methodology for measuring [TIMP-2]·[IGFBP7] is standardized and applicable to the evaluation context.
Reference standard	Low	The U-Score method used as the reference standard is appropriate for the evaluation of AKI in this setting.

Family name of the first author: Lakhal

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients over 75 years-old undergoing aortic valve replacement with CPB were consecutively included, excluding those with preoperative renal replacement therapy.
Index test	Low	Biomarkers including TIMP2 IGFBP7 were measured in a blinded fashion to clinical outcomes.
Reference standard	Low	Plasma creatinine was measured at specific time points, and changes were evaluated independently of biomarker results.
Flow and Timing	Low	Measurements were taken preoperatively, postoperatively, and at the 6th postoperative hour, with an appropriate timing for the detection of CS-AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	Study focused on elderly patients undergoing cardiac surgery, which is consistent with the research question on CS-AKI.
Index test	Low	Biomarkers TIMP2 IGFBP7, pNGAL, pCysC, and pUrea were measured using standardized protocols, suitable for the evaluation of AKI.
Reference standard	Low	Use of plasma creatinine changes as a reference standard is clinically accepted for assessing AKI, making it applicable for this study's objectives.

Family name of the first author: Lakhal

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients over 75 years-old undergoing aortic valve replacement with CPB were consecutively included, excluding those with preoperative renal replacement therapy.
Index test	Low	Biomarkers including TIMP2 IGFBP7 were measured in a blinded fashion to clinical outcomes.
Reference standard	Low	Plasma creatinine was measured at specific time points, and changes were evaluated independently of biomarker results.
Flow and Timing	Low	Measurements were taken preoperatively, postoperatively, and at the 6th postoperative hour, with an appropriate timing for the detection of CS-AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	Study focused on elderly patients undergoing cardiac surgery, which is consistent with the research question on CS-AKI.
Index test	Low	Biomarkers TIMP2 IGFBP7, pNGAL, pCysC, and pUrea were measured using standardized protocols, suitable for the evaluation of AKI.
Reference standard	Low	Use of plasma creatinine changes as a reference standard is clinically accepted for assessing AKI, making it applicable for this study's objectives.

Family name of the first author: Liangos

Publication year: 2009

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Consecutive adult subjects scheduled for on-pump cardiac surgery were enrolled, excluding off-pump surgeries and organ transplant recipients.
Index test	Low	Urinary biomarkers were measured 2 hours following CPB, and the process included optimizing sample conditions to prevent degradation.
Reference standard	Low	AKI was defined by an increase in serum creatinine by ≥50% within 72 hours post-CPB, using a validated definition.
Flow and Timing	Low	Urinary biomarkers were measured at a fixed time point post-CPB, and the outcome measure was defined clearly.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population consisted of adults undergoing cardiac surgery, which is applicable to the research question.
Index test	Low	The biomarkers were tested using standardized methods and the results were normalized to urinary creatinine.
Reference standard	Low	The definition of AKI using serum creatinine increase is widely accepted and applicable for this study.

Family name of the first author: Maisel

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients presenting with AHF symptoms and planned treatment with IV diuretic agents, without specific exclusion criteria that would bias the sample.
Index test	Low	NGAL values were obtained and analyzed at least 6 hours before the event or at the first collection time, ensuring blinding to the outcome.
Reference standard	Low	The primary outcome was defined using a composite of clinical events and renal replacement therapy, with clear criteria for AKI.
Flow and Timing	Low	The timing of NGAL measurements and the primary outcome assessments were clearly specified and appropriately timed relative to each other.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised of patients with AHF requiring diuretic therapy, reflecting the clinical setting of interest.
Index test	Low	Plasma NGAL was measured using a consistent and standardized method, appropriate for assessing AKI in AHF patients.
Reference standard	Low	The use of a composite clinical endpoint including worsening renal function and need for RRT is clinically relevant for AHF patients.

Family name of the first author: Matsa

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Consecutive adult admissions to the ICU with absence of chronic kidney disease, renal transplant, or AKI were included.
Index test	Low	Both urine and plasma NGAL were measured in a blinded fashion to clinical outcomes.
Reference standard	Low	AKI was defined using the RIFLE criteria, based on urine output and creatinine, ensuring an objective reference standard.
Flow and Timing	Low	Samples were collected at admission and every 24 hours until 72 hours, with an appropriate timing relative to the outcome.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population represents a general adult ICU population without pre-existing renal disease, aligning with the study aims.
Index test	Low	The measurement of both plasma and urine NGAL was conducted using standardized protocols, enhancing applicability.
Reference standard	Low	The use of the RIFLE criteria for defining AKI is widely accepted and clinically relevant, supporting the study's conclusions.

Family name of the first author: Matsui

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients admitted to the ICU were divided into AKI and non-AKI groups according to the occurrence of AKI during hospitalization.
Index test	Low	Urinary L-FABP and PCX levels were measured as biomarkers for tubular and podocyte injury, respectively.
Reference standard	Low	The reference standard for diagnosing AKI was based on the serum creatinine levels and urinary biomarkers.
Flow and Timing	Low	Biomarker levels were evaluated at specific time points relative to the occurrence of AKI, ensuring appropriate timing.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients admitted to the ICU, which is relevant for assessing the clinical significance of biomarkers.
Index test	Low	Urinary L-FABP and PCX were measured using standardized methods, which are applicable for detecting AKI.
Reference standard	Low	Serum creatinine was used as a reference standard, which is commonly accepted for diagnosing AKI in clinical practice.

Family name of the first author: Matsui

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included adult patients undergoing cardiac surgery who were admitted to the CCU, excluding those dependent on chronic dialysis support or who died within the first 24 h after surgery.
Index test	Low	Urinary L-FABP was measured using a standardized ELISA kit, and the results were compared to other urinary biomarkers.
Reference standard	Low	AKI was defined according to AKIN criteria, which include an absolute increase in SCr of ≥26.4 μmol/L (0.3 mg/dl) from baseline or a relative increase in SCr of >1.5-fold from baseline within the first 48 h after cardiac surgery.
Flow and Timing	Low	Urine samples were collected at specific time points (before operation, immediately after operation, and 3, 6, 18, 24, and 48 h postoperatively) allowing for an appropriate interval between index test and reference standard.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing cardiac surgery, making the findings relevant to this specific patient group.
Index test	Low	Urinary L-FABP was measured using a standardized and validated ELISA kit, ensuring consistency and reliability of the test results.
Reference standard	Low	The AKIN criteria used as the reference standard are widely accepted and appropriate for diagnosing AKI in the postoperative setting.

Family name of the first author: Meersch

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a heterogeneous cohort of patients with significant comorbidities related to AKI, including those with chronic kidney disease.
Index test	Low	Urinary [TIMP-2] and [IGFBP7] were measured using standardized protocols, ensuring consistent and reliable results.
Reference standard	Low	The reference standard for AKI was based on the RIFLE and AKIN criteria, which are widely accepted clinical definitions.
Flow and Timing	Low	Urine samples were collected at predefined time points (preoperatively and 4, 12, 24 h after CPB) relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population represented a broad spectrum of patients undergoing cardiac surgery, making the findings generalizable.
Index test	Low	The biomarkers [TIMP-2] and [IGFBP7] were measured using validated methods, which are applicable to the evaluation of AKI.
Reference standard	Low	The RIFLE and AKIN criteria used as the reference standard are clinically relevant and accepted for diagnosing AKI.

Family name of the first author: Nickolas

Publication year: 2008

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included adults presenting to the emergency department for hospital admission, excluding those with preexisting conditions that could affect kidney function.
Index test	Low	Urinary Neutrophil Gelatinase-Associated Lipocalin (NGAL) was measured using a standardized method.
Reference standard	Low	AKI was defined using serum creatinine measurements and fractional excretion of sodium.
Flow and Timing	Low	The timing of the biomarker measurement and the subsequent follow-up for AKI were clearly defined.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population represents a broad range of patients presenting to the emergency department, making the results applicable.
Index test	Low	The measurement of urinary NGAL was performed using a consistent and validated method, enhancing applicability.
Reference standard	Low	The use of serum creatinine and fractional excretion of sodium is a clinically accepted method for diagnosing AKI.

Family name of the first author: Obata

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing open surgical repair of an abdominal aortic aneurysm, excluding those undergoing dialysis or requiring emergency surgery.
Index test	Low	Urinary biomarkers L-FABP, NGAL, and albumin were measured using standardized methods.
Reference standard	Low	AKI was defined according to the Kidney Disease Improving Global Outcomes (KDIGO) criteria.
Flow and Timing	Low	Urine samples were collected at predefined time points (before surgery, after anesthesia induction, 2 hours after AXC, immediately after surgery, 4 hours after surgery).

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing open surgical repair of an abdominal aortic aneurysm, relevant to the research question.
Index test	Low	The biomarkers L-FABP, NGAL, and albumin were measured using consistent and validated methods, enhancing applicability.
Reference standard	Low	The KDIGO criteria used as the reference standard are widely accepted for diagnosing AKI, supporting the study's conclusions.

Family name of the first author: Özkür

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients undergoing cardiac surgery were consecutively included, with clear inclusion and exclusion criteria.
Index test	Low	TIMP-2*IGFBP7 (Nephrocheck®) measurements were performed in a blinded fashion to the clinical outcomes.
Reference standard	Low	AKI was defined using established criteria, ensuring an objective reference standard.
Flow and Timing	Low	The timing of the index test (ICU admission) and the reference standard (AKI within 48 hours) was clearly specified.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population included patients undergoing cardiac surgery, which is relevant for evaluating the biomarker.
Index test	Low	The TIMP-2*IGFBP7 (Nephrocheck®) was measured using a standardized and validated method, enhancing applicability.
Reference standard	Low	AKI was defined using established criteria, which are clinically accepted for diagnosing AKI.

Family name of the first author: Okuda

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 48 patients undergoing emergency laparotomy, divided into AKI and non-AKI groups based on KDIGO criteria.
Index test	Low	Urinary L-FABP was measured quantitatively and qualitatively using a point-of-care (POC) kit, with results blinded to clinical outcomes.
Reference standard	Low	AKI was defined using the KDIGO criteria, based on changes in serum creatinine levels.
Flow and Timing	Low	Urinary L-FABP was measured at specific time points, including 2 hours after entering the operating room, ensuring appropriate timing relative to the development of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing emergency laparotomy, which is relevant for assessing the clinical utility of L-FABP in this setting.
Index test	Low	Urinary L-FABP was measured using standardized and validated methods, both quantitatively and qualitatively, enhancing applicability.
Reference standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Onk

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 375 patients who underwent CABG surgery, with clear inclusion and exclusion criteria to ensure homogeneity.
Index test	Low	The biomarker NGAL was measured at specific time points postoperatively, ensuring the results were not influenced by the outcome.
Reference standard	Low	AKI was defined using the RIFLE criteria, providing a standardized and objective reference standard.
Flow and Timing	Low	The timing of the index test (NGAL measurement) and the reference standard (AKI diagnosis) were clearly defined and appropriate.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing CABG surgery, making the findings relevant for this specific patient group.
Index test	Low	NGAL was measured using standardized protocols, enhancing the applicability of the results.
Reference standard	Low	The RIFLE criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Orhon Ergun

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 60 geriatric patients(≥ 65 years old) undergoing major oncologic surgery with laparotomy, with clear inclusion criteria.
Index test	Low	Plasma NGAL levels were measured at specific times preoperatively and postoperatively, using standardized methods.
Reference standard	Low	AKI was defined and diagnosed based on established criteria, ensuring an objective reference standard.
Flow and Timing	Low	The timing of the index test (NGAL measurement) and the reference standard (AKI diagnosis) were clearly defined and appropriate.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised geriatric patients undergoing major oncologic surgery, making the findings relevant for this specific group.
Index test	Low	Plasma NGAL was measured using standardized protocols, enhancing the applicability of the results.
Reference standard	Low	The established criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Pei

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 162 sepsis patients, with clear inclusion and exclusion criteria, ensuring a homogeneous patient group.
Index test	Low	Biomarkers including cystatin C, KIM-1, NGAL, klotho, and FGF-23 were measured using standardized methods.
Reference standard	Low	AKI was defined according to the 2012 KDIGO criteria, providing a clear and objective reference standard.
Flow and Timing	Low	Biomarker levels were measured upon admission, and the timing of the measurements was appropriate relative to the outcome.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised sepsis patients, which is relevant for assessing the utility of biomarkers in this context.
Index test	Low	Biomarkers were measured using standardized and validated methods, enhancing the applicability of the results.
Reference standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Perry

Publication year: 2010

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 879 patients undergoing CABG surgery, excluding those with preoperative renal replacement therapy.
Index test	Low	Plasma NGAL levels were measured post-CPB, ensuring that the measurement was performed at a consistent time point.
Reference standard	Low	AKI was defined as a ≥50% increase in serum creatinine from preoperative levels, providing a clear reference standard.
Flow and Timing	Low	The timing of the index test (NGAL measurement) and the reference standard (AKI diagnosis) were clearly defined and appropriate.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing CABG surgery, making the findings relevant for this group.
Index test	Low	Plasma NGAL was measured using standardized protocols, enhancing the applicability of the results.
Reference standard	Low	The definition of AKI used as the reference standard is widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Pilarczyk

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 60 consecutive patients undergoing isolated on-pump CABG, with clear inclusion and exclusion criteria.
Index test	Low	Urinary [TIMP-2]*[IGFBP7] was measured using a standardized and validated method.
Reference standard	Low	AKI was defined according to the KDIGO criteria, providing a clear and objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, including 4 hours postoperatively, relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing isolated on-pump CABG surgery, making the findings relevant for this specific group.
Index test	Low	Urinary [TIMP-2]*[IGFBP7] was measured using a consistent and validated method, enhancing the applicability of the results.
Reference standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Pilarczyk

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a well-defined cohort of patients undergoing thoracic aortic surgery with moderate hypothermic circulatory arrest.
Index test	Low	Biomarkers Cystatin C and [TIMP-2]*[IGFBP7] were measured using standardized and validated assays.
Reference standard	Low	AKI was defined according to the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at predefined time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients undergoing thoracic aortic surgery, making the findings relevant for this specific group.
Index test	Low	Cystatin C and [TIMP-2]*[IGFBP7] were measured using standardized and validated methods, enhancing the applicability of the results.
Reference standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Pode Shakked

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 52 patients with confirmed SARS-CoV-2 infection presenting with symptoms and undergoing routine blood draws.
Index test	Low	Serum Cystatin C and NGAL were measured using standardized and validated assays.
Reference standard	Low	AKI was defined according to KDIGO criteria, providing a clear and objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at the time of ED presentation, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients presenting with symptoms of COVID-19, making the findings relevant for this specific group.
Index test	Low	Serum Cystatin C and NGAL were measured using standardized and validated methods, enhancing the applicability of the results.
Reference standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Garms

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 94 patients receiving vancomycin, excluding those with pre-existing AKI and CKD Stage 5.
Index Tests	Low	Urinary biomarkers IL-18, KIM-1, NGAL, TIMP-2, and IGFBP7 were evaluated systematically.
Reference Standard	Low	AKI was defined using the KDIGO criteria, a recognized standard for diagnosing acute kidney injury.
Flow and Timing	Low	Biomarkers were measured at specific intervals, correlating with the onset and progression of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	High	The study focused on patients treated with vancomycin, making the findings particularly applicable to this group.
Index Tests	High	The urinary biomarkers were measured using validated assays, enhancing the reliability of the results.
Reference Standard	High	KDIGO criteria for AKI are widely accepted and used in clinical practice, increasing the applicability of the study.

Family name of the first author: Sinkala

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 80 individuals, with 40 having kidney disease and 40 controls, ensuring a balanced patient group.
Index Tests	Low	Biomarkers such as serum creatinine, urea, MAU, and KIM-1 were measured using standardized methods.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at the time of recruitment, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised individuals with and without kidney disease, making the findings broadly applicable.
Index Tests	Low	Biomarkers were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Szymanowicz

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 114 adult patients undergoing cardiac surgery using CPB, with clear inclusion and exclusion criteria.
Index Tests	Low	Regional cerebral oxygen saturation(rScO2) and somatic oxygen saturation(SomO2), along with blood NGAL and cystatin C, were measured using standardized methods.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at predefined time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing cardiac surgery, making the findings relevant for this specific group.
Index Tests	Low	Biomarkers were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Tan

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 157 patients with urosepsis after ureteroscopic lithotripsy, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine IL-8, NGAL, and KIM-1 were measured using standardized methods.
Reference Standard	Low	AKI was defined using the KDIGO criteria, providing a clear and objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with urosepsis after ureteroscopic lithotripsy, making the findings relevant for this specific group.
Index Tests	Low	Urine IL-8, NGAL, and KIM-1 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Torregrosa

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 193 patients, with 144 undergoing coronary angiography and 49 undergoing cardiac surgery, with clear inclusion criteria.
Index Tests	Low	Urinary KIM-1, NGAL, and L-FABP were measured using standardized methods.
Reference Standard	Low	AKI was defined using the RIFLE criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing coronary angiography or cardiac surgery, making the findings relevant for these specific groups.
Index Tests	Low	Urinary KIM-1, NGAL, and L-FABP were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The RIFLE criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Ueta

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 47 patients undergoing endovascular stent graft repair of aortic aneurysms, with clear inclusion and exclusion criteria.
Index Tests	Low	Biomarkers including urinary NGAL, blood NGAL, NAG, microalbumin, and L-FABP were measured using standardized methods.
Reference Standard	Low	AKI was defined using Acute Kidney Injury Network(AKIN) criteria, providing a clear and objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing endovascular stent graft repair of aortic aneurysms, making the findings relevant for this specific group.
Index Tests	Low	Biomarkers were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Vaidya

Publication year: 2008

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 204 patients, 102 with AKI and 102 without AKI, ensuring a balanced representation of both groups.
Index Tests	Low	Urinary biomarkers KIM-1, NGAL, IL-18, NAG, HGF, Cystatin C, VEGF, IP-10, and total protein were measured using validated assays.
Reference Standard	Low	AKI was defined using clinical criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised a mix of patients with and without AKI, making the findings broadly applicable.
Index Tests	Low	Biomarkers were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The clinical criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Valette

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 100 consecutive critically ill patients with stable serum creatinine concentrations prior to contrast medium injection.
Index Tests	Low	Plasma NGAL was measured using standardized methods.
Reference Standard	Low	CI-AKI was defined using AKIN criteria, providing a clear and objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of CI-AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised critically ill patients, making the findings relevant for this specific group.
Index Tests	Low	Plasma NGAL was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing CI-AKI.

Family name of the first author: Vogel

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included a well-defined cohort of 80 patients with acute respiratory infection symptoms divided into COVID-19 and control groups.
Index Tests	Low	Urinary KIM-1 and NAG were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined according to the 2012 KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at the time of presentation in the emergency department, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with acute respiratory infection symptoms, making the findings relevant for this specific group.
Index Tests	Low	Urinary KIM-1 and NAG were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Wang

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 103 patients who underwent cardiopulmonary bypass(CPB), with a clear division into AKI and non-AKI groups.
Index Tests	Low	Urinary IL-18 and NGAL were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using clinical criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing CPB, making the findings relevant for this specific group.
Index Tests	Low	Urinary IL-18 and NGAL were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The clinical criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Wang

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 57 cardiac surgery patients, with a clear division into AKI and non-AKI groups.
Index Tests	Low	Urinary TIMP-2 and IGFBP7 were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using clinical criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing cardiac surgery, making the findings relevant for this specific group.
Index Tests	Low	Urinary TIMP-2 and IGFBP7 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The clinical criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Waskowski

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 93 patients undergoing abdominal aortic surgery, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary TIMP-2 and IGFBP7 were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing abdominal aortic surgery, making the findings relevant for this specific group.
Index Tests	Low	Urinary TIMP-2 and IGFBP7 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Wetz

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 42 patients undergoing coronary artery bypass graft surgery, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary TIMP-2 and IGFBP-7 were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing coronary artery bypass graft surgery, making the findings relevant for this specific group.
Index Tests	Low	Urinary TIMP-2 and IGFBP-7 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Yang

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 103 patients with acute decompensated heart failure, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary NGAL, KIM-1, and serum Cys-C were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with acute decompensated heart failure, making the findings relevant for this specific group.
Index Tests	Low	Urinary NGAL, KIM-1, and serum Cys-C were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Van Wolfswinkel

Publication year: 2016

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 39 patients with imported Plasmodium falciparum infection, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary and serum NGAL and KIM-1 were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with imported Plasmodium falciparum infection, making the findings relevant for this specific group.
Index Tests	Low	Urinary and serum NGAL and KIM-1 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Qian

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 91 patients undergoing cardiac surgery, with a clear division into AKI and non-AKI groups.
Index Tests	Low	Urine Klotho and NGAL were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the AKIN criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing cardiac surgery, making the findings relevant for this specific group.
Index Tests	Low	Urine Klotho and NGAL were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Srisawat

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 192 patients with leptospirosis, with a clear division into AKI and non-AKI groups.
Index Tests	Low	Urine NGAL was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the RIFLE criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with leptospirosis, making the findings relevant for this specific group.
Index Tests	Low	Urine NGAL was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The RIFLE criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Zeng

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 199 patients undergoing major surgery, with a clear division into AKI and non-AKI groups.
Index Tests	Low	Urine NGAL and L-FABP were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the AKIN criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing major surgery, making the findings relevant for this specific group.
Index Tests	Low	Urine NGAL and L-FABP were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Doi

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 339 critically ill patients in a mixed ICU setting, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine L-FABP, NGAL, IL-18, NAG, and albumin were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the RIFLE criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised a mixed ICU population, making the findings relevant for this specific group.
Index Tests	Low	Urine L-FABP, NGAL, IL-18, NAG, and albumin were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The RIFLE criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Haase-Fielitz

Publication year: 2009

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 114 adult patients undergoing cardiac surgery necessitating the use of CPB, with clear inclusion and exclusion criteria.
Index Tests	Low	Serum NGAL, cystatin C, creatinine, and urea were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using an increase in serum creatinine, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised adult patients undergoing cardiac surgery necessitating the use of CPB, making the findings relevant for this specific group.
Index Tests	Low	Serum NGAL, cystatin C, creatinine, and urea were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The increase in serum creatinine used as the reference standard is widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Han

Publication year: 2009

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 90 adult patients undergoing cardiac surgery, with a clear division into AKI and non-AKI groups.
Index Tests	Low	Urine KIM-1, NAG, and NGAL were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using an increase in serum creatinine, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised adult patients undergoing cardiac surgery, making the findings relevant for this specific group.
Index Tests	Low	Urine KIM-1, NAG, and NGAL were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The increase in serum creatinine used as the reference standard is widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Hjortrup

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 222 patients with severe sepsis needing fluid resuscitation, with clear inclusion and exclusion criteria.
Index Tests	Low	Plasma and urine NGAL were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, and the use of RRT was documented, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with severe sepsis needing fluid resuscitation, making the findings relevant for this specific group.
Index Tests	Low	Plasma and urine NGAL were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard for AKI and documentation of RRT use are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Katagiri

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 77 adult patients undergoing cardiac surgery, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine L-FABP and NAG were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the Acute Kidney Injury Network(AKIN) criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised adult patients undergoing cardiac surgery, making the findings relevant for this specific group.
Index Tests	Low	Urine L-FABP and NAG were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Lei

Publication year: 2018

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 150 patients with decompensated cirrhosis, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine KIM-1, NGAL, and serum Cystatin C were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with decompensated cirrhosis, making the findings relevant for this specific group.
Index Tests	Low	Urine KIM-1, NGAL, and serum Cystatin C were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Li

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 60 patients undergoing liver transplantation, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine NGAL and L-FABP were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the AKIN criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing liver transplantation, making the findings relevant for this specific group.
Index Tests	Low	Urine NGAL and L-FABP were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Manabe

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 220 patients with chronic kidney disease undergoing elective catheterization, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine L-FABP was measured using standardized and validated assays.
Reference Standard	Low	CI-AKI was defined using an increase in serum creatinine, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of CI-AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with chronic kidney disease undergoing elective catheterization, making the findings relevant for this specific group.
Index Tests	Low	Urine L-FABP was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The increase in serum creatinine used as the reference standard is widely accepted and clinically relevant for diagnosing CI-AKI.

Family name of the first author: Mayer

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 100 patients undergoing cardiac surgery with CPB, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine NGAL, KIM-1, L-FABP, and TIMP2 × IGFBP7 were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the AKIN criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients undergoing cardiac surgery with CPB, making the findings relevant for this specific group.
Index Tests	Low	Urine NGAL, KIM-1, L-FABP, and TIMP2 × IGFBP7 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Md Ralib

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 225 patients with systemic inflammatory response syndrome(SIRS), with clear inclusion and exclusion criteria.
Index Tests	Low	Plasma NGAL was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with SIRS, making the findings relevant for this specific group.
Index Tests	Low	Plasma NGAL was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Nisula

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 1001 critically ill patients, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine IL-18 was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised critically ill patients, making the findings relevant for this specific group.
Index Tests	Low	Urine IL-18 was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Nisula

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 1042 critically ill patients, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine NGAL was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, and RRT use was documented, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised critically ill patients, making the findings relevant for this specific group.
Index Tests	Low	Urine NGAL was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard for AKI and documentation of RRT use are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Parikh

Publication year: 2005

Risk of Bias

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study included 138 patients with ALI/ARDS, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine IL-18 was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using an increase in serum creatinine, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Assessment
Patient Selection	Low	The study population comprised patients with ALI/ARDS, making the findings relevant for this specific group.
Index Tests	Low	Urine IL-18 was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The increase in serum creatinine used as the reference standard is widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Parikh

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study included 1219 participants undergoing cardiac surgery, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine IL-18, urine NGAL, and plasma NGAL were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the AKIN criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study population comprised participants undergoing cardiac surgery, making the findings relevant for this specific group.
Index Tests	Low	Urine IL-18, urine NGAL, and plasma NGAL were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The AKIN criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Parikh

Publication year: 2004

Risk of Bias

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study included 72 patients with different forms of acute renal failure and other renal diseases, with clear inclusion and exclusion criteria.
Index Tests	Low	Urine IL-18 was measured using standardized and validated assays.
Reference Standard	Low	ATN was defined using clinical criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of ATN.

Applicability

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study population comprised patients with different forms of acute renal failure and other renal diseases, making the findings relevant for this specific group.
Index Tests	Low	Urine IL-18 was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The clinical criteria used as the reference standard are widely accepted and clinically relevant for diagnosing ATN.

Family name of the first author: Park

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study included 140 patients with local infections, sepsis, and septic shock, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary NGAL was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study population comprised patients with local infections, sepsis, and septic shock, making the findings relevant for this specific group.
Index Tests	Low	Urinary NGAL was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Shapiro

Publication year: 2010

Risk of Bias

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study included 661 patients presenting to the emergency department with suspected sepsis, with clear inclusion and exclusion criteria.
Index Tests	Low	Plasma NGAL was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using an increase in serum creatinine, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study population comprised patients presenting to the emergency department with suspected sepsis, making the findings relevant for this specific group.
Index Tests	Low	Plasma NGAL was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The increase in serum creatinine used as the reference standard is widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Finge

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study included 93 patients undergoing cardiac surgery with cardiopulmonary bypass, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary [TIMP-2] × [IGFBP-7] was measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the KDIGO criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study population comprised patients undergoing cardiac surgery with cardiopulmonary bypass, making the findings relevant for this specific group.
Index Tests	Low	Urinary [TIMP-2] × [IGFBP-7] was measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The KDIGO criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Tekce

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study included 22 patients undergoing cisplatin treatment, with clear inclusion and exclusion criteria.
Index Tests	Low	Urinary and serum KIM-1 were measured using standardized and validated assays.
Reference Standard	Low	AKI was defined using the RIFLE criteria, ensuring an objective reference standard.
Flow and Timing	Low	Biomarker measurements were performed at specific time points, ensuring appropriate timing relative to the occurrence of AKI.

Applicability

Domains	Assessment	Support for Adjustment
Patient Selection	Low	The study population comprised patients undergoing cisplatin treatment, making the findings relevant for this specific group.
Index Tests	Low	Urinary and serum KIM-1 were measured using standardized and validated methods, enhancing the applicability of the results.
Reference Standard	Low	The RIFLE criteria used as the reference standard are widely accepted and clinically relevant for diagnosing AKI.

Family name of the first author: Torregrosa

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Study included 135 patients admitted to the ICU with acute coronary syndrome or heart failure undergoing angiography or surgery. No mention of non-consecutive sampling or inappropriate exclusions.
Index test	Low	Biomarkers NGAL, IL-18, and cystatin C were measured 12 hours post-procedure. No indication that the results were interpreted with knowledge of the reference standard.
Reference standard	Low	Serum creatinine was monitored over the following six days for AKI diagnosis according to RIFLE criteria. No indication of interpretation influenced by index test results.
Flow and Timing	Low	All patients had biomarkers measured at the same time point (12 hours post-intervention) and followed up for the same duration (six days).

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were from the ICU and had acute conditions, which matches the study's aim to evaluate biomarkers in this specific patient group.
Index test	Low	The measurement of biomarkers (NGAL, IL-18, cystatin C) was done using standardized methods and appears suitable for the study population.
Reference standard	Low	The use of serum creatinine increase as a reference standard is appropriate for detecting AKI in the studied patient population.

Family name of the first author: Tu

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Unclear	Patients were enrolled based on sepsis criteria, but the text does not specify whether the recruitment was consecutive or random. There is no mention of avoiding a case-control design or inappropriate exclusions.
Index test	Low	Urinary netrin-1 and KIM-1 levels were measured at multiple time points post-ICU admission. The results appear to be interpreted without knowledge of the reference standard results.
Reference standard	Low	Serum Creatinine (SCr) levels were used as a reference standard, and the measurements were taken at various time points, suggesting that the results were interpreted independently of the index test results.
Flow and Timing	Low	Samples were collected at 0, 1, 3, 6, 24, and 48 hours after ICU admission for both urinary netrin-1 and KIM-1, indicating a consistent approach across patients. All patients received SCr measurements at these same intervals.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study included only septic patients, which limits its applicability to other populations. Additionally, only patients with normal kidney function were included, excluding those with pre-existing renal insufficiency.
Index test	Low	The index tests (urinary netrin-1 and KIM-1) were performed consistently across all participants using standardized protocols.
Reference standard	Low	The use of SCr as the reference standard is appropriate for the detection of AKI in septic patients, given its established role in clinical practice.

Family name of the first author: Varela

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included adult patients undergoing cardiac surgery, excluding those with end-stage renal disease, kidney transplant, and those who developed AKI before surgery. Patients were recruited from a single center.
Index test	Low	FeU, FeNa, and urinary NGAL were measured at 1, 6, and 24 hours following cardiac surgery. The study indicates that the tests were performed without knowledge of the reference standard results.
Reference standard	Low	AKI was determined and classified according to AKIN criteria, including an increase in serum creatinine or decrease in urine output. The reference standard was applied uniformly across all patients.
Flow and Timing	Low	The timing of the index tests and reference standard was consistent, with FeU, FeNa, and NGAL measured at predetermined intervals post-surgery, and serum creatinine monitored continuously.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population consisted of adult patients undergoing cardiac surgery, which is specific to the context of the research question regarding early diagnosis of AKI post-cardiac surgery.
Index test	Low	The study utilized FeU, FeNa, and NGAL as biomarkers, which aligns with the objective of assessing their utility in predicting AKI. The methods for measuring these biomarkers were standardized and clearly described.
Reference standard	Low	The reference standard of AKI was defined by the AKIN criteria, which is a commonly accepted method for diagnosing AKI in clinical settings, making it applicable to the study's objectives.

Family name of the first author: Wybraniec

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 95 patients with coronary artery disease undergoing elective or urgent CA/PCI. Patients were recruited based on clinical and laboratory data, ensuring a representative sample of the intended patient population.
Index test	Low	Urinary biomarkers (IL-18, KIM-1, L-FABP) were measured 6 hours post-procedure. The measurements were blinded to the results of the reference standard, reducing the risk of bias.
Reference standard	Low	Contrast-induced acute kidney injury (CI-AKI) was defined as a ≥50% relative or ≥0.3 mg/dL absolute increase in serum creatinine at 48 hours post-procedure. The reference standard was applied uniformly and independently of the index test results.
Flow and Timing	Low	Biomarker levels were assessed at a consistent time point (6 hours post-procedure), and serum creatinine was measured at 24 and 48 hours post-procedure, ensuring a standardized timeline for both the index test and the reference standard.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study population comprised patients with coronary artery disease undergoing coronary angiography or percutaneous coronary intervention, which is relevant to the clinical scenario of interest.
Index test	Low	The index tests (urinary IL-18, KIM-1, L-FABP) were measured using standardized ELISA kits, and the methodology is appropriate for the study's aims.
Reference standard	Low	The reference standard of CI-AKI, defined by serum creatinine changes, is commonly used in clinical practice and is suitable for the purpose of the study.

Family name of the first author: Munir

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 88 patients undergoing cardiovascular surgery with cardiopulmonary bypass. Patients were recruited consecutively, and the inclusion criteria were clearly stated, minimizing selection bias.
Index test	Low	Urinary NGAL was measured using a chemiluminescent microparticle immunoassay at 4 hours post-surgery. The results were interpreted without knowledge of the reference standard, which was serum creatinine levels.
Reference standard	Low	Serum creatinine was used as the reference standard for diagnosing AKI, and it was measured at predefined intervals (pre-operatively, 4 hours, 24 hours, and 48 hours post-surgery) independently of the index test results.
Flow and Timing	Low	Both the index test (urinary NGAL) and the reference standard (serum creatinine) were timed appropriately, with measurements taken at the same intervals post-surgery, ensuring consistency across the study.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study focused on patients undergoing cardiovascular surgery with cardiopulmonary bypass, which is relevant to the clinical context of diagnosing AKI in this specific patient group.
Index test	Low	The index test (urinary NGAL) was conducted using a standardized method (chemiluminescent microparticle immunoassay) and is appropriate for the evaluation of AKI in post-surgical patients.
Reference standard	Low	The use of serum creatinine as the reference standard is a widely accepted measure for diagnosing AKI and is suitable for the patient population undergoing cardiopulmonary bypass surgery.

Family name of the first author: Thanakitcharu

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 130 patients undergoing open cardiac surgery, selected consecutively, and excluded those with preexisting renal dysfunction, ensuring a representative sample of the study population.
Index test	Low	Urinary NGAL was measured at baseline and at 0, 3, and 6 hours post-surgery using a standardized method (ARCHITECT NGAL assay), which suggests the test was conducted without knowledge of the reference standard results.
Reference standard	Low	Serum creatinine was used as the reference standard for diagnosing AKI, with measurements taken at baseline and daily post-surgery, independently of the index test results.
Flow and Timing	Low	The timing of the index test and reference standard measurements were consistent across all patients, with urinary NGAL and serum creatinine measured at predefined intervals.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study was conducted on adult patients undergoing open cardiac surgery, which is relevant to the clinical scenario of interest. The exclusion criteria were appropriate for ensuring the validity of the study.
Index test	Low	The index test (urinary NGAL) was performed using a standardized method, making it applicable to similar clinical settings.
Reference standard	Low	The reference standard (serum creatinine) is a widely accepted method for diagnosing AKI, making it suitable for the study's objectives and comparable to other clinical practices.

Family name of the first author: Zhen

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included 172 patients with acute coronary syndromes(ACS) consecutively admitted to the Coronary Care Unit. Patients were excluded if they had chronic kidney disease or other conditions that could affect the biomarkers.
Index test	Low	Calprotectin and NGAL were measured using standardized enzyme-linked immunosorbent assay kits. The tests were performed blinded to the clinical outcomes.
Reference standard	Low	Serum creatinine was used as the reference standard for diagnosing AKI, and it was measured at baseline and daily post-admission. The results were interpreted independently of the index test.
Flow and Timing	Low	Blood samples for calprotectin and NGAL were collected within 6 hours of admission, and serum creatinine was measured at baseline and daily post-admission, ensuring a consistent timeline for both the index tests and the reference standard.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study focused on patients with acute coronary syndromes, which is relevant to the clinical context of diagnosing AKI in this specific patient group.
Index test	Low	The index tests (calprotectin and NGAL) were conducted using standardized methods, making them applicable for evaluating AKI in ACS patients.
Reference standard	Low	The use of serum creatinine as the reference standard is a widely accepted measure for diagnosing AKI and is suitable for the patient population with ACS.

Family name of the first author: Qiu

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Consecutive patients admitted to ICU fulfilling sepsis-3.0 criteria were included, excluding those with pre-existing AKI or CKD.
Index test	Unclear	Not specified if the tests were interpreted blinded to the reference standard results.
Reference standard	Low	KDIGO criteria used for defining AKI, which is widely accepted and specific for AKI diagnosis.
Flow and Timing	Low	All patients included in the study underwent both index tests and reference standard assessment.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	High	Study was conducted in an ICU setting with septic patients, which may limit applicability to other patient populations.
Index test	Low	Hepcidin and NGAL were measured using established methods applicable to the evaluation question.
Reference standard	Low	KDIGO criteria for AKI are considered the current gold standard and are applicable to the evaluation question.

Family name of the first author: Irqsusi

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients undergoing elective coronary artery bypass grafting and/or valve surgery with CPB were consecutively screened.
Index test	Low	Urinary TIMP-2 and IGFBP7 concentrations were measured using the NephroCheck™ Test in a blinded manner.
Reference standard	Low	AKI was defined according to the KDIGO classification, a recognized standard for diagnosing AKI.
Flow and Timing	Low	Samples were collected preoperatively, intraoperatively, and postoperatively at defined intervals.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	High	The study focused on a specific group of patients undergoing cardiac surgery, which may limit applicability to other patient populations.
Index test	Low	The NephroCheck™ Test was used consistently across all patients, ensuring comparability of the results.
Reference standard	Low	KDIGO criteria are widely accepted and applicable for diagnosing AKI in this context.

Family name of the first author: Guray

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included consecutive patients with left ventricular systolic dysfunction undergoing coronary angiography.
Index test	Low	NGAL measurements were performed at predefined time points and the point-of-care assay was used.
Reference standard	Low	The diagnosis of CIN was based on the change in serum creatinine levels, a commonly accepted criterion for CIN.
Flow and Timing	Low	Patients were followed up at 48th and 72nd hours post-procedure for creatinine levels, and NGAL was measured at baseline and 4, 24 hours post-procedure.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	High	The study included only patients with LVSD and normal or moderately reduced kidney function, limiting generalizability.
Index test	Low	The point-of-care NGAL measurements were performed using a consistent protocol and timing.
Reference standard	Low	The reference standard for CIN was based on serum creatinine levels, which is widely accepted in clinical practice.

Family name of the first author: Zaitoun

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study enrolled adult patients with sepsis syndromes directly assessed for enrollment after ICU admission.
Index test	Low	Biomarkers including RRI, sNGAL, uNGAL, and Cys C were measured using standardized protocols.
Reference standard	Low	AKI was defined according to the KDIGO criteria, a recognized standard for diagnosing AKI.
Flow and Timing	Low	All patients received the same reference standard, and the timing of measurements was consistent.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a single-center ICU setting, which may affect the external validity of the findings.
Index test	Low	Biomarkers were measured using standardized methods, enhancing reproducibility and comparability.
Reference standard	Low	The KDIGO criteria for AKI are considered the current gold standard and are applicable to the evaluation.

Family name of the first author: Sahu

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Included consecutive "all-comer" patients undergoing PCI, providing a representative sample of the target population.
Index test	Low	NGAL levels were measured using a commercial ELISA kit, ensuring standardized measurement protocol.
Reference standard	Low	CIN diagnosis was based on changes in serum creatinine, a standard method for assessing CIN.
Flow and Timing	Low	All patients underwent the index test and reference standard assessment within a defined timeframe.

Applicability

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a single-center setting, which may limit the generalizability of the findings.
Index test	Low	Used a standard ELISA kit for NGAL measurement, which enhances the consistency and comparability of the results.
Reference standard	Low	Serum creatinine changes were used to define CIN, which is a widely accepted criterion.

Family name of the first author: Salmito

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Continuous or random sampling of patients with stage 2 AKI based on serum creatinine criterion only.
Index test	Low	Endothelium-related biomarkers measured without knowledge of clinical outcomes.
Reference standard	Low	Kidney support therapy (KST) indicated based on clinical parameters and outcomes recorded.
Flow and Timing	Unclear	Not explicitly stated whether all patients received the reference standard and if there was an appropriate interval between index tests and reference standard.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	Study focused on ICU patients with stage 2 AKI and may not be generalizable to other populations or settings.
Index test	Low	Biomarkers measured include AGPT2 and syndecan-1, which are relevant to the study's objective.
Reference standard	Low	The clinical model used for determining the need for KST is consistent and applicable to the study context.

Family name of the first author: Peng

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were recruited prospectively with clear inclusion and exclusion criteria, ensuring a representative sample of ICU patients.
Index test	Low	Urine CCL2 levels were measured without knowledge of the clinical outcomes, reducing the risk of bias in interpreting the test results.
Reference standard	Low	AKI was diagnosed according to the KDIGO criteria, a widely accepted standard, and the determination of baseline SCr was clearly defined.
Flow and Timing	Unclear	While the study indicates that samples were collected at various points, it is not explicitly stated whether all patients underwent the reference standard at the same intervals.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific ICU setting, which might limit the generalizability of the findings to other clinical settings or patient populations.
Index test	Low	The method of measuring urine CCL2 appears to be consistent with the study's objectives and the population studied.
Reference standard	Low	The reference standard used, the KDIGO criteria for diagnosing AKI, is widely accepted and applicable across different clinical settings.

Family name of the first author: He

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a clear description of patient groups with and without septic shock, indicating continuous or random enrolment.
Index test	Low	Serum chemokine levels, such as IL-8, were measured without knowledge of the reference standard results.
Reference standard	Low	The reference standard used to diagnose PS-AKI and Non-PS-AKI was appropriately defined and applied.
Flow and Timing	Unclear	There is insufficient information to determine if all patients received the reference standard and if there was an appropriate interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific context related to COVID-19, which may limit applicability to other populations.
Index test	Low	The index test, measuring serum chemokine levels, aligns with the evaluation question and study objectives.
Reference standard	Low	The reference standard is suitable for distinguishing between the conditions being studied.

Family name of the first author: Wang

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, with no indication of selective sampling.
Index test	Low	Multi-parameter ultrasound evaluation was performed without knowledge of the clinical outcomes.
Reference standard	Low	AKI diagnosis was based on serum creatinine levels, a recognized standard, and was blinded to the index test.
Flow and Timing	Unclear	It is unclear whether all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study focuses on patients with sepsis in an ICU setting, which may limit applicability to other contexts.
Index test	Low	The multi-parameter ultrasound scoring system is well-defined and relevant to the study's objectives.
Reference standard	Low	The reference standard for AKI diagnosis is appropriate and applicable within the study's scope.

Family name of the first author: Zhang

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on sepsis diagnosis, with controls matched for healthy individuals.
Index test	Low	suPAR levels were measured at multiple time points post-diagnosis without knowledge of the clinical outcomes.
Reference standard	Low	The reference standard for AKI stages was clearly defined and applied consistently.
Flow and Timing	Unclear	It is not specified if all patients received the same reference standard and the timing of measurements.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study population consists of sepsis patients, which may limit generalizability to other patient groups.
Index test	Low	suPAR measurement protocol is detailed and appears suitable for assessing AKI in sepsis patients.
Reference standard	Low	The reference standard for AKI is appropriate and is commonly used in clinical practice.

Family name of the first author: He

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were recruited based on the presence of stage 2/3 AKI and followed a defined inclusion/exclusion criteria.
Index test	Low	Chemokine levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	The reference standard for diagnosing PS-AKI was based on KDIGO criteria, a widely accepted standard.
Flow and Timing	Unclear	Unclear whether all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific context related to COVID-19 patients in the ICU, which may limit generalizability.
Index test	Low	The method for measuring chemokine levels is consistent with the study's objectives and population.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Zhang

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled prospectively based on sepsis diagnosis, with clear inclusion and exclusion criteria.
Index test	Low	Plasma suPAR levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed based on the KDIGO criteria, a widely accepted standard.
Flow and Timing	Unclear	Unclear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific ICU setting with sepsis patients, which may limit applicability.
Index test	Low	The method of measuring plasma suPAR levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Wang

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled retrospectively with clear inclusion and exclusion criteria, ensuring a representative sample.
Index test	Low	Serum Cys C levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was defined based on the established criteria, providing a clear and consistent reference standard.
Flow and Timing	Unclear	The study does not specify if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients with acute pancreatitis, limiting generalizability.
Index test	Low	The method of measuring serum Cys C levels is consistent with the study's objectives and population.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Ni

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of sepsis patients.
Index test	Low	The prognostic factors were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is unclear whether all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in an ICU setting, which may limit the applicability to other clinical settings or patient populations.
Index test	Low	The method of measuring the prognostic factors, including serum cystatin-C and lactate levels, is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is appropriate and applicable within the study's scope.

Family name of the first author: Obata

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were consecutively enrolled, and inclusion and exclusion criteria were clearly defined.
Index test	Low	Urinary biomarkers were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	The reference standard for AKI diagnosis was based on the KDIGO criteria, a widely accepted standard.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients undergoing TAVI, which may limit generalizability.
Index test	Low	The method of measuring urinary biomarkers is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Not applicable (This is a guideline document, not a research paper)

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Not applicable	The document outlines the scope of the guideline, which is intended for a broad range of healthcare providers and settings.
Index test	Not applicable	The guideline updates recommendations based on new evidence since the last publication, including risk stratification and diagnostic work-up.
Reference standard	Not applicable	The guideline uses the KDIGO criteria for defining and staging AKI and AKD, which is a widely accepted standard.
Flow and Timing	Not applicable	The document does not describe a flow of patients or timing of interventions; it is a guideline document.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The guideline is intended to be broadly applicable across different populations and healthcare settings.
Index test	Low	The guideline includes recommendations for the diagnostic work-up of AKI, which are applicable to the intended audience.
Reference standard	Low	The reference standard for diagnosing AKI and AKD is applicable within the scope of the guideline.

Family name of the first author: Kounatidis

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	The review article describes the inclusion of relevant literature on sepsis-associated acute kidney injury.
Index test	Not Applicable	As a review article, there is no index test; the focus is on synthesizing existing evidence.
Reference standard	Not Applicable	There is no reference standard; the article discusses various diagnostic criteria and clinical practices.
Flow and Timing	Not Applicable	The review nature of the article does not involve patient flow or timing of interventions.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The review covers a broad range of studies and is applicable to a wide variety of clinical settings.
Index test	Not Applicable	The review does not propose a specific index test but summarizes the current understanding of diagnostic tools.
Reference standard	Low	The review discusses the KDIGO criteria and other standards applicable to the topic of sepsis-associated AKI.

Family name of the first author: Li

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled based on clear inclusion and exclusion criteria, ensuring a representative sample.
Index test	Low	Urinary biomarkers were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in an ICU setting, which may limit the applicability to other clinical settings or patient populations.
Index test	Low	The method of measuring urinary biomarkers is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Zhang

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were enrolled based on clear inclusion and exclusion criteria, ensuring a representative sample of wasp sting victims.
Index test	Low	Procalcitonin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients with wasp stings, which may limit generalizability to other populations.
Index test	Low	The method of measuring procalcitonin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Patel

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of cirrhotic patients.
Index test	Low	Urinary NGAL levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the AKIN criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on cirrhotic patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary NGAL levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Chen

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Studies were selected based on clear inclusion and exclusion criteria, ensuring a representative sample.
Index test	Low	Urinary CCL14 levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on critically ill patients, which may limit generalizability.
Index test	Low	The method of measuring urinary CCL14 levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Yuan

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were divided into AKI and non-AKI groups based on clear inclusion and exclusion criteria, ensuring a representative sample.
Index test	Low	Serum NGAL and β2-MG levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients with acute pancreatitis, which may limit generalizability.
Index test	Low	The method of measuring serum NGAL and β2-MG levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Jin

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of sepsis patients.
Index test	Low	Levels of IL-17A were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on sepsis patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring IL-17A levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Ya-Fen

Publication year: 2024

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of SA-AKI patients.
Index test	Low	NGAL levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on SA-AKI patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring NGAL levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Li

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of AKI patients.
Index test	Low	Serum uric acid levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on AKI patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring serum uric acid levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Chen

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of CAP patients.
Index test	Low	Serum Cystatin C levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on CAP patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring serum Cystatin C levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Hao

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of UUTC patients.
Index test	Low	Levels of procalcitonin, C-reactive protein, and neutrophil gelatinase-associated lipocalin were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on UUTC patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring the biomarkers is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Udzik

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of post-cardiac surgery patients.
Index test	Low	Novel kidney injury biomarkers were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on post-cardiac surgery patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring the novel biomarkers is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Yu

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of cardiac surgery patients.
Index test	Low	TIMP-2 and IGFBP-7 levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on cardiac surgery patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring TIMP-2 and IGFBP-7 levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Qin

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of AKI patients.
Index test	Low	Urinary Interleukin-18 levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on AKI patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary Interleukin-18 levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Grechukhina

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients treated with anti-VEGF drugs.
Index test	Low	Urinary biomarkers levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients treated with anti-VEGF drugs, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary biomarkers levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Xu

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of AKI patients.
Index test	Low	Neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on AKI patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Abd El Wahab

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of cirrhotic patients with AKI.
Index test	Low	Serum cystatin C and angiopoietin 2 levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on cirrhotic patients with AKI, which may limit generalizability to other populations.
Index test	Low	The method of measuring serum cystatin C and angiopoietin 2 levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Hu

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of septic patients.
Index test	Low	Urinary NGAL levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on septic patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary NGAL levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Lima

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of liver transplant patients.
Index test	Low	Proenkephalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on liver transplant patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring proenkephalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Teo

Publication year: 2023

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients presenting with congestive cardiac failure or systemic inflammatory response syndrome.
Index test	Low	Neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients presenting with congestive cardiac failure or systemic inflammatory response syndrome, which may limit generalizability to other populations.
Index test	Low	The method of measuring neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Akalya

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients treated with nephrotoxic drugs.
Index test	Low	Urinary tissue inhibitor of metalloproteinase-2 and insulin-like growth factor binding protein-7 levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients treated with nephrotoxic drugs, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary tissue inhibitor of metalloproteinase-2 and insulin-like growth factor binding protein-7 levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Wu

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients with different stages of chronic kidney disease undergoing intravenous contrast-enhanced computed tomography.
Index test	Low	Contrast-associated acute kidney injury was measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients with different stages of chronic kidney disease undergoing intravenous contrast-enhanced computed tomography, which may limit generalizability to other populations.
Index test	Low	The method of measuring contrast-associated acute kidney injury is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Sharrod-Cole

Publication year: 2022

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients undergoing cardiac surgery requiring cardiopulmonary bypass.
Index test	Low	Plasma NGAL levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients undergoing cardiac surgery requiring cardiopulmonary bypass, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma NGAL levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Albeladi

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of ICU patients.
Index test	Low	Urinary neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on ICU patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Chun

Publication year: 2018

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of severely burned patients.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on severely burned patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Liu

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients undergoing cardiac surgery.
Index test	Low	Urinary L-FABP and urinary NGAL levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients undergoing cardiac surgery, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary L-FABP and urinary NGAL levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Wagener

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients undergoing orthotopic liver transplantation.
Index test	Low	Urinary neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients undergoing orthotopic liver transplantation, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Makris

Publication year: 2009

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of critically ill multiple trauma patients.
Index test	Low	Urinary neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on critically ill multiple trauma patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Constantin

Publication year: 2010

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of adult critically ill patients.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on adult critically ill patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Cruz

Publication year: 2010

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of adult ICU patients.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on adult ICU patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: de Geus

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of adult ICU patients.
Index test	Low	Plasma and urine neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on adult ICU patients, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma and urine neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Endre

Publication year: 2011

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients in general intensive care units.
Index test	Low	Urinary biomarkers (γ-glutamyltranspeptidase, alkaline phosphatase, neutrophil-gelatinase-associated lipocalin, cystatin C, kidney injury molecule-1, and interleukin-18) were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients in general intensive care units, which may limit generalizability to other populations.
Index test	Low	The method of measuring urinary biomarkers is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Breidthardt

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients presenting to the emergency department with acute heart failure.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the AKIN criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients presenting to the emergency department with acute heart failure, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Breidthardt

Publication year: 2012

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients presenting to the emergency department with acute heart failure.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the AKIN criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients presenting to the emergency department with acute heart failure, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Camou

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients with septic shock admitted to the medical intensive care unit.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the RIFLE criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients with septic shock admitted to the medical intensive care unit, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Doi

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients scheduled for cardiac surgery.
Index test	Low	Plasma neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients scheduled for cardiac surgery, which may limit generalizability to other populations.
Index test	Low	The method of measuring plasma neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Gaipov

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on clear inclusion and exclusion criteria, ensuring a representative sample of patients undergoing open-heart surgery.
Index test	Low	Serum uric acid and neutrophil gelatinase-associated lipocalin levels were measured without knowledge of the clinical outcomes, reducing the risk of bias.
Reference standard	Low	AKI was diagnosed using the KDIGO criteria, a recognized standard, and the baseline serum creatinine was defined.
Flow and Timing	Unclear	It is not clear if all patients received the reference standard and if there was an appropriate time interval.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study was conducted in a specific setting focusing on patients undergoing open-heart surgery, which may limit generalizability to other populations.
Index test	Low	The method of measuring serum uric acid and neutrophil gelatinase-associated lipocalin levels is consistent with the study's objectives.
Reference standard	Low	The reference standard for diagnosing AKI is applicable within the context of the study.

Family name of the first author: Cuartero

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Consecutively admitted patients during 8 months; exclusion based on predefined criteria
Index test	Unclear	Not specified whether NGAL testing was performed blinded to clinical information
Reference standard	Low	Used established AKIN and KDIGO classifications
Flow and Timing	Low	NGAL and clinical assessments performed at defined intervals

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	Study included a representative ICU population with no chronic kidney disease
Index test	Low	Used a point-of-care device for NGAL testing
Reference standard	Low	Utilized standard AKI definitions (AKIN/KDIGO) for determining presence or absence of AKI

Family name of the first author: Khawaja

Publication year: 2019

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Continuous enrollment of patients admitted to ICU with suspected sepsis over a defined period.
Index test	Low	pNGAL levels measured at 12h, 24h, and 48h post-ICU admission, blinded to SCr results.
Reference standard	Low	Diagnosis of AKI based on the RIFLE criteria, which is considered a standard method for diagnosing AKI.
Flow and Timing	Low	Blood samples for pNGAL and SCr collected at the same intervals (12h, 24h, 48h) post-admission.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	Study focused on critically ill adult patients with sepsis, may not be applicable to other populations or settings.
Index test	Low	pNGAL measurement protocol clearly described and appears consistent with typical use in similar studies.
Reference standard	Low	Use of RIFLE criteria aligns with current clinical guidelines for diagnosing AKI, enhancing applicability of findings.

Family name of the first author: Mosa

Publication year: 2018

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Unclear	Patients divided into AKI and non-AKI groups based on serum creatinine, but the exact inclusion process not detailed.
Index test	Low	Serum NGAL levels were measured using standardized methods, and the results were not influenced by clinical outcomes.
Reference standard	Low	AKI diagnosis based on the KDIGO classification criteria, which is a recognized standard.
Flow and Timing	Unclear	Time intervals between surgery and testing not explicitly stated, which could affect the correlation between tests.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study focuses on Egyptian ICU patients post-open heart surgery, which limits the generalizability of the results.
Index test	Low	Serum NGAL was measured using a standard method, making it comparable to other studies.
Reference standard	Low	The use of KDIGO criteria for AKI diagnosis ensures that the standard is widely accepted and applicable.

Family name of the first author: Padhy

Publication year: 2014

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected based on the absence of chronic nephropathy and inclusion criteria for the study were clearly defined.
Index test	Low	Serum NGAL and cystatin C were measured using standardized ELISA kits, and the results were blinded to clinical outcomes.
Reference standard	Low	AKI was defined by a rise in serum creatinine level of at least 0.5 mg/dl from baseline 48 hours after PCI.
Flow and Timing	Low	Blood samples were collected at predefined times (0, 4, 24, 48 h) post-angioplasty, ensuring consistent timing.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included patients undergoing PCI, making it applicable to a similar patient population undergoing the same procedure.
Index test	Low	The use of standardized ELISA kits for measuring NGAL and cystatin C enhances reproducibility and comparability.
Reference standard	Low	The reference standard used (rise in serum creatinine) is a widely accepted method for diagnosing AKI in clinical settings.

Family name of the first author: Sun

Publication year: 2017

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Patients were selected continuously from 2014 to 2015 with confirmed scrub typhus, excluding those with concurrent infections.
Index test	Low	NGAL and KIM-1 were measured using sandwich enzyme-linked immunosorbent assays with blinded results to clinical outcomes.
Reference standard	Low	AKI diagnosis was based on the RIFLE criteria, a well-established classification system for assessing kidney function.
Flow and Timing	Low	Samples were collected at admission and follow-ups were conducted until renal recovery or for at least 3 months.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	The study focuses specifically on patients with scrub typhus, which may limit applicability to other types of acute kidney injury scenarios.
Index test	Low	Standardized methods were used to measure NGAL and KIM-1, which makes the results comparable across similar studies.
Reference standard	Low	Utilization of the RIFLE criteria provides a recognized standard for diagnosing AKI, facilitating broader clinical relevance.

Family name of the first author: de Geus

Publication year: 2013

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Consecutive adult patients admitted to ICU were included, with clear exclusion criteria defined.
Index test	Low	Plasma NGAL was measured at predefined time points (<24 h) following admission, with the results interpreted without knowledge of the SCr levels.
Reference standard	Low	AKI was defined using the Acute Kidney Injury Network (AKIN) classification system, a widely accepted standard.
Flow and Timing	Low	The timing of sample collection for NGAL and SCr was consistent, with measurements taken at the same intervals post-admission.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	The study included a broad spectrum of ICU patients, enhancing the generalizability of the findings.
Index test	Low	Plasma NGAL was measured using a standard immunoassay, making the methodology comparable to other studies.
Reference standard	Low	The use of the AKIN classification system for defining AKI ensures that the reference standard is clinically relevant.

Family name of the first author: Lee

Publication year: 2021

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Low	Continuous enrollment of patients undergoing cardiovascular surgery.
Index test	Low	Urinary L-FABP measured without knowledge of AKI development.
Reference standard	Low	AKI diagnosis based on KDIGO criteria, blinded to urinary L-FABP results.
Flow and Timing	Low	Measurements taken at specified intervals post-surgery.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	Low	Study population is representative of patients undergoing cardiovascular surgery.
Index test	Low	Urinary L-FABP measurement is consistent with current diagnostic protocols.
Reference standard	Low	KDIGO criteria used for AKI diagnosis are widely accepted standards.

Family name of the first author: Prowle

Publication year: 2015

Risk of Bias

Domains	Assessment	Support for Assessment
Patient selection	Unclear	Study included high-risk patients, but details on the representativeness of the cohort are not fully clear.
Index test	Low	Biomarkers were measured without knowledge of the AKI status.
Reference standard	Low	AKI defined using RIFLE criteria, independent of biomarker results.
Flow and Timing	Unclear	Some patients' data were not fully collected, raising concerns about completeness.

Applicability Concerns

Domains	Assessment	Support for Assessment
Patient selection	High	Study population comprised high-risk patients, possibly limiting generalizability.
Index test	Low	Biomarkers were measured using established methods.
Reference standard	Low	RIFLE criteria are widely recognized and used in clinical practice.

Overview of QUADAS-2

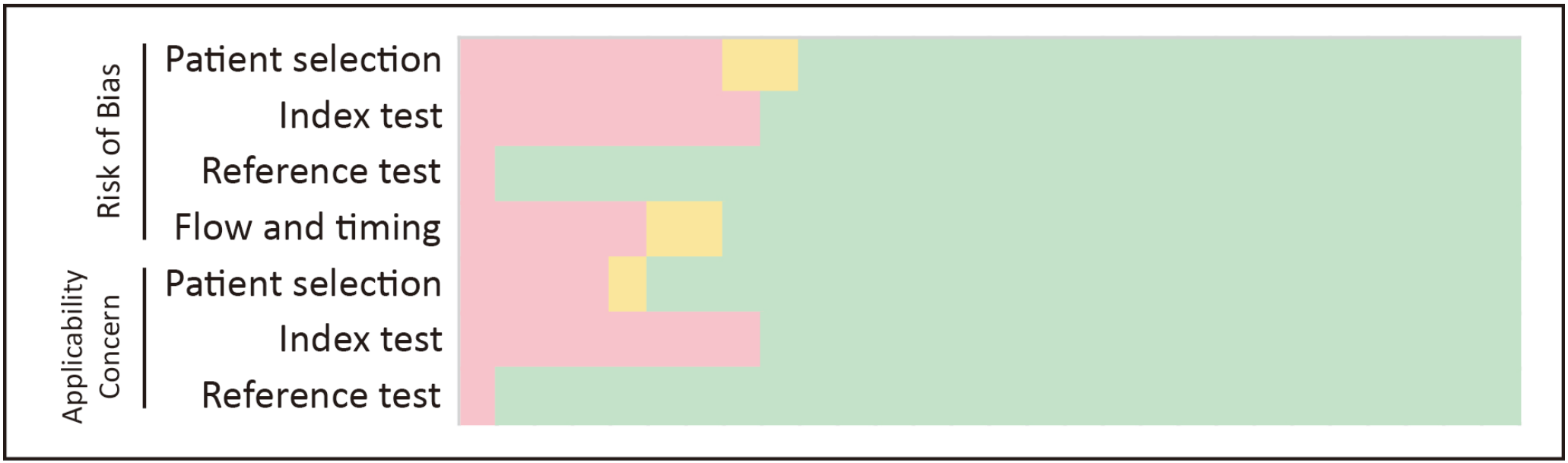


Figure S 2 QUADAS-2 ROB summary.

Introduction of STARD 2015

Brief introduction of STARD 2015

Items and what to evaluate

Item 1: Identification as a study of diagnostic accuracy using at least one measure of accuracy (such as sensitivity, specificity, predictive values, or AUC).
Item 2: Structured summary of study design, methods, results, and conclusions (for specific guidance, see STARD for Abstracts).
Item 3: Scientific and clinical background, including the intended use and clinical role of the index test.
Item 4: Study objectives and hypotheses.
Item 5: Whether data collection was planned before the index test and reference standard were performed (prospective study) or after (retrospective study).
Item 6: Eligibility criteria.
Item 7: On what basis potentially eligible participants were identified (such as symptoms, results from previous tests, inclusion in registry).
Item 8: Where and when potentially eligible participants were identified (setting, location and dates).
Item 9: Whether participants formed a consecutive, random or convenience series.
Item 10a: Index test, in sufficient detail to allow replication.
Item 10b: Reference standard, in sufficient detail to allow replication.
Item 11: Rationale for choosing the reference standard (if alternatives exist).
Item 12a: Definition of and rationale for test positivity cut-offs or result categories of the index test, distinguishing pre-specified from exploratory.
Item 12b: Definition of and rationale for test positivity cut-offs or result categories of the reference standard, distinguishing pre-specified from exploratory.
Item 13a: Whether clinical information and reference standard results were available to the performers/readers of the index test.
Item 13b: Whether clinical information and index test results were available to the assessors of the reference standard.
Item 14: Methods for estimating or comparing measures of diagnostic accuracy.
Item 15: How indeterminate index test or reference standard results were handled.
Item 16: How missing data on the index test and reference standard were handled.
Item 17: Any analyses of variability in diagnostic accuracy, distinguishing pre-specified from exploratory.
Item 18: Intended sample size and how it was determined.
Item 19: Flow of participants, using a diagram.
Item 20: Baseline demographic and clinical characteristics of participants.
Item 21a: Distribution of severity of disease in those with the target condition.
Item 21b: Distribution of alternative diagnoses in those without the target condition.

Item 22: Time interval and any clinical interventions between index test and reference standard.
Item 23: Cross tabulation of the index test results (or their distribution) by the results of the reference standard.
Item 24: Estimates of diagnostic accuracy and their precision (such as 95% confidence intervals).
Item 25: Any adverse events from performing the index test or the reference standard.
Item 26: Study limitations, including sources of potential bias, statistical uncertainty, and generalisability.
Item 27: Implications for practice, including the intended use and clinical role of the index test.
Item 28: Registration number and name of registry.
Item 29: Where the full study protocol can be accessed.
Item 30: Sources of funding and other support; role of funders.

Explanation

A diagnostic accuracy study evaluates the ability of one or more medical tests to correctly classify study participants as having a target condition. This can be a disease, a disease stage, response or benefit from therapy, or an event or condition in the future. A medical test can be an imaging procedure, a laboratory test, elements from history and physical examination, a combination of these, or any other method for collecting information about the current health status of a patient.

The test whose accuracy is evaluated is called index test. A study can evaluate the accuracy of one or more index tests. Evaluating the ability of a medical test to correctly classify patients is typically done by comparing the distribution of the index test results with those of the reference standard. The reference standard is the best available method for establishing the presence or absence of the target condition. An accuracy study can rely on one or more reference standards.

If test results are categorized as either positive or negative, the cross tabulation of the index test results against those of the reference standard can be used to estimate the sensitivity of the index test (the proportion of participants with the target condition who have a positive index test), and its specificity (the proportion without the target condition who have a negative index test). From this cross tabulation (sometimes referred to as the contingency or “2x2” table), several other accuracy statistics can be estimated, such as the positive and negative predictive values of the test. Confidence intervals around estimates of accuracy can then be calculated to quantify the statistical precision of the measurements.

If the index test results can take more than two values, categorization of test results as positive or negative requires a test positivity cut-off. When multiple such cut-offs can be defined, authors can report a receiver operating characteristic (ROC) curve which graphically represents the combination of sensitivity and specificity for each possible test positivity cut-off. The area under the ROC curve informs in a single numerical value about the overall diagnostic accuracy of the index test.

The intended use of a medical test can be diagnosis, screening, staging, monitoring, surveillance, prediction or prognosis. The clinical role of a test explains its position relative to existing tests in the clinical pathway. A replacement test, for example, replaces an existing test. A triage test is used before an existing test; an add-on test is used after an existing test.

Besides diagnostic accuracy, several other outcomes and statistics may be relevant in the evaluation of medical tests. Medical tests can also be used to classify patients for purposes other than diagnosis, such as staging or prognosis. The STARD list was not explicitly developed for these other outcomes, statistics, and study types, although most STARD items would still apply.

Results of STARD 2015

Camou 2013

Item No.	Assessment	Support for Assessment
1	Yes	"The main objective was to evaluate the diagnosis value of pNGAL... estimates of sensitivity, specificity, and AUC are reported."
2	Yes	Abstract includes structured sections: Purpose, Patients and method, Results, Conclusion.
3	Yes	Introduction discusses AKI in septic shock and the clinical role of NGAL as a biomarker.
4	Yes	"The main objective was to evaluate the diagnosis value of pNGAL... secondary objectives included predicting persistent AKI and RRT."
5	Yes	"Prospective observational cohort study... data collection planned before index test and reference standard."
6	No	Eligibility criteria (e.g., adult patients with septic shock) are mentioned but lack explicit inclusion/exclusion details.
7	Yes	Participants identified based on "admission for septic shock" (clinical condition).
8	Yes	"Conducted in a medical ICU at CHU de Bordeaux between July 2009 and April 2010."
9	Yes	"Fifty consecutive patients... included without exclusion."
10a	Yes	"pNGAL measured with TRIAGE Meter Pro™ at D0, D1, D2."
10b	Yes	Reference standard: AKI defined by RIFLE/AKIN criteria.
11	Yes	Rationale: RIFLE/AKIN are "established criteria" for AKI diagnosis.
12a	Yes	Cut-offs determined via ROC curves and Youden index (e.g., 348 ng/mL at D1).
12b	Yes	RIFLE/AKIN criteria have predefined severity categories.
13a	No	No mention of whether clinical information was available to NGAL testers.
13b	No	AKI assessors blinded to NGAL results: "RIFLE/AKIN scores measured a posteriori."
14	Yes	"ROC curves, AUC, sensitivity, and specificity calculated."
15	No	No discussion of indeterminate/missing NGAL or reference standard results.
16	No	Missing data handling not described.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	Yes	AKI severity stratified by RIFLE/AKIN stages.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between NGAL testing and reference standard not specified.

23	No	No cross-tabulation of NGAL results against RIFLE/AKIN outcomes.
24	No	AUC reported but no confidence intervals for accuracy estimates.
25	No	Adverse events from NGAL testing not mentioned.
26	Yes	Limitations: Small sample size, single-center design.
27	Yes	Conclusion states pNGAL "could help decide RRT."
28	Yes	Trial registration: NCT01122225.
29	No	No mention of protocol availability.
30	No	Funding sources and roles not disclosed in the abstract.

Chen 2023

Item No.	Assessment	Support for Assessment
1	Yes	"Serum Cystatin C had an area under the receiver operating characteristic curve (AUC) of 0.81 [...] 68% sensitivity, 80% specificity" (Abstract). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Structured abstract includes "Background," "Methods," "Results," and "Conclusion" sections (Abstract).
3	Yes	Introduction describes clinical significance of AKI in CAP and rationale for using Cystatin C as a biomarker (Introduction).
4	Yes	"In this study, we evaluated whether AKI [...] could be well predicted by serum Cystatin C" (Abstract). Clear objective and hypothesis.
5	Yes	Retrospective study: "We reviewed the medical records [...] from January 2014 to May 2017" (Methods).
6	Yes	Inclusion/exclusion criteria listed under "Patient selection" (Methods).
7	Yes	Participants identified via CAP diagnosis (Methods: "admitted to the hospital for CAP").
8	Yes	"Nanjing First Hospital from January 2014 to May 2017" (Methods).
9	No	No mention of consecutive, random, or convenience sampling in patient selection.
10a	Yes	Serum Cystatin C measured "within 24 h after admission" (Abstract) and laboratory methods described (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI (Methods).
11	No	No rationale provided for choosing KDIGO over other AKI definitions.
12a	No	Cutoff for Cystatin C (1.37 mg/L) determined post hoc using Youden index (Methods), not pre-specified.
12b	Yes	KDIGO criteria for AKI (pre-specified and internationally recognized).
13a	No	No information on whether clinicians had access to reference standard results during Cystatin C testing.
13b	No	No information on whether assessors of KDIGO criteria had access to Cystatin C results.
14	Yes	ROC curves and AUC used to estimate accuracy (Methods/Results).
15	No	No description of handling indeterminate test results.

16	Yes	Exclusion of patients with "incomplete medical records" (Methods).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup variability not quantified as pre-specified).
18	No	No sample size calculation or justification provided.
19	Yes	Flowchart included as Figure 1.
20	Yes	Table 1 summarizes baseline demographics and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., KDIGO stages) reported.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test and reference standard not explicitly stated.
23	No	No 2x2 contingency table of Cystatin C vs. KDIGO results.
24	Yes	AUC, sensitivity, specificity, and 95% CIs reported (Results).
25	No	No mention of adverse events from testing.
26	Yes	Limitations discussed: retrospective design and lack of urine output data (Discussion).
27	Yes	Conclusions emphasize clinical implications for AKI prediction (Abstract/Discussion).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	Funding sources and ethics statement provided (end of article).

Chen 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The goal of this research was to assess the predictive performance of urinary CCL14 as a marker for persistent AKI... The pooled sensitivity and specificity results... AUC was 0.84." (Explicitly reports sensitivity, specificity, and AUC as diagnostic accuracy measures.)
2	Yes	Structured abstract includes "Background," "Methods," "Results," and "Conclusions" sections, adhering to STARD for Abstracts.
3	Yes	Background describes AKI's clinical significance and urinary CCL14's role as a biomarker for early identification of persistent AKI.
4	Yes	"The goal of this research was to assess the predictive performance..." (States objective).
5	Yes	"retrospective study design (meta-analysis of existing studies)... data collected after index test and reference standard were performed."
6	Yes	Inclusion/exclusion criteria detailed under "Methods: Inclusion and exclusion criteria."
7	No	No explicit description of how participants were identified (e.g., symptoms, prior tests) in individual studies.
8	No	Settings and dates of included studies not comprehensively reported (only general descriptions in Table 1).
9	No	No information on whether participants were consecutive, random, or convenience samples in included studies.
10a	Yes	"Urinary CCL14 measurement timing and cutoff values" described in Table 1 and Methods.

10b	Yes	Reference standard (KDIGO criteria for AKI) defined in Table 1 and Methods.
11	Yes	KDIGO cited as the standard AKI diagnostic criteria, justified in Background.
12a	No	Cutoff values for urinary CCL14 mentioned but no rationale for pre-specified thresholds.
12b	Yes	KDIGO criteria for AKI positivity pre-specified and universally accepted.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Hierarchical summary receiver operating characteristic curves (HSROCs) were used..." (Methods describe accuracy estimation).
15	No	No mention of handling indeterminate test results in included studies.
16	No	Missing data handling not explicitly described.
17	Yes	"Funnel plots to check for publication bias" and heterogeneity analysis (Methods).
18	No	No pre-specified sample size calculation for the meta-analysis.
19	Yes	PRISMA flowchart provided (Fig. 1).
20	Yes	Baseline demographics and clinical characteristics summarized in Table 2.
21a	Yes	AKI severity distribution reported in Table 1 (e.g., "Stage 3: 17%").
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test and reference standard not specified.
23	No	No cross-tabulation of index test vs. reference standard results (only pooled estimates).
24	Yes	"Pooled sensitivity: 0.81 (95% CI 0.72–0.87), specificity: 0.71 (95% CI 0.53–0.84)" (Results).
25	No	Adverse events from urinary CCL14 testing not reported.
26	Yes	"Study limitations... discussed in the manuscript" (Discussion section).
27	Yes	"Urinary CCL14 can be used as an effective marker..." (Conclusion).
28	Yes	"PROSPERO [No. CRD42023399055]" (Methods).
29	No	Full study protocol accessibility not mentioned.
30	Yes	"Sources of funding and other support" declared in the Acknowledgments.

Bihorac 2014

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity at the pre-specified high-sensitivity cutoff of 0.3 [...] was 92% (95% CI 85%-98%)" (Abstract, Main Results). Explicitly reports sensitivity and confidence intervals.
2	Yes	Structured abstract includes "Rationale," "Objectives," "Methods," "Measurements," "Main Results," and "Conclusions" (Abstract).

3	Yes	"AKI occurs frequently in critically ill patients, is difficult to predict and adversely impacts [...] clinical outcomes" (Introduction). Describes clinical role of biomarkers for AKI risk stratification.
4	Yes	"Objectives: [...] validate a clinical test for urinary [TIMP-2]•[IGFBP7] [...] for AKI risk stratification" (Abstract).
5	Yes	"Prospective multicenter study" (Methods). Data collection planned before index/reference tests.
6	Yes	Inclusion: ICU patients with respiratory/cardiovascular dysfunction; exclusion: pre-existing AKI stage 2-3 (Methods).
7	Yes	Participants identified based on ICU admission, organ dysfunction scores, and urinary catheter presence (Methods).
8	Yes	"23 participating sites in the United States [...] May through December 2012" (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling. Likely convenience sampling but not stated.
10a	Yes	"Urinary TIMP-2 and IGFBP7 were measured using a clinical immunoassay platform" (Methods). Replicable details provided.
10b	Yes	"AKI was adjudicated by [...] three independent expert nephrologists [...] using KDIGO criteria" (Methods). Reference standard clearly defined.
11	Yes	"Clinical adjudication [...] is the most rigorous standard" for AKI diagnosis (Introduction). Justifies use of clinical adjudication.
12a	Yes	"Pre-specified high-sensitivity cutoff of 0.3" with rationale from prior studies (Abstract and Methods).
12b	Yes	KDIGO criteria (stage 2-3 AKI) used as reference standard; defined by adjudicators (Methods).
13a	Yes	Adjudicators were "blinded to the results of the test" (Methods). No access to index test results.
13b	Yes	Biomarker results were blinded to adjudicators (Methods). No access to reference standard data.
14	Yes	"Sensitivity, specificity, likelihood ratios, AUC, and multivariate models" reported (Results).
15	No	No mention of handling indeterminate index/reference test results.
16	No	No explicit description of missing data handling.
17	No	Variability across labs mentioned but not analyzed as pre-specified vs. exploratory (Methods).
18	No	"Target sample size of 400" stated, but no rationale (e.g., power calculation) provided (Methods).
19	Yes	"Figure 1" illustrates participant flow (Methods and Supplement).
20	Yes	"Baseline demographic and clinical characteristics" reported (Results and Supplement).
21a	No	No distribution of disease severity in AKI patients (e.g., KDIGO stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Biomarkers measured at enrollment; AKI assessed within 12 hours (Methods). Time interval defined.
23	Yes	Cross-tabulation implied by sensitivity/specificity and risk ratios (Results).
24	Yes	"Sensitivity 92% (95% CI 85%-98%)"; AUC with confidence intervals (Abstract/Results).
25	No	No adverse events reported from biomarker testing.
26	Yes	"Study limitations [...] generalizability to non-ICU populations" (Discussion).
27	Yes	"Implications for practice [...] stratifies patients into distinct risk categories" (Abstract/At a Glance).
28	Yes	"ClinicalTrials.gov NCT01573962" (Abstract).
29	No	No mention of protocol accessibility.

30	Yes	"Funded by Astute Medical" (Abstract). Role of funders described in Supplement.

Zhen 2021

Item No.	Assessment	Support for Assessment
1	Yes	"Plasma calprotectin and NGAL could discriminate the development of AKI respectively with an area under the ROC curve (AUC) of 0.864 and 0.850." (Explicitly reports AUC, a measure of diagnostic accuracy.)
2	Yes	Structured abstract includes "Background," "Methods," "Results," and "Conclusions." (Matches STARD for Abstracts guidance.)
3	Yes	"The objective of the present study was to evaluate the two plasma biomarkers... in early detecting the development of AKI in the setting of ACS." (Describes clinical role of the index tests.)
4	Yes	"The objective of this study was to evaluate... biomarkers... in early detecting the development of AKI." (States study objectives.)
5	Yes	"This was an observational prospective cohort study." (Data collection planned before index/reference tests.)
6	Yes	Inclusion/exclusion criteria detailed under "Study population." (Eligibility criteria explicitly listed.)
7	Yes	"ACS was defined according to published guidelines... admitted within 48 h after the onset of symptoms." (Basis for identifying participants: symptoms and timing.)
8	Yes	"Coronary Care Unit (CCU) at Yantai Yuhuangding Hospital in one year from March 2018 to March 2019." (Specifies setting, location, and dates.)
9	Yes	"Observational prospective cohort study of consecutively admitted patients." (Participants formed a consecutive series.)
10a	Yes	"Blood samples... subjected to enzyme-linked immunosorbent assay... dilution ratios for plasma calprotectin and NGAL were 1:40, 1:100." (Sufficient detail for replication of index test.)
10b	Yes	"AKI was determined using the AKIN criteria... defined as an abrupt increase in serum creatinine..." (Reference standard described in detail.)
11	No	No rationale provided for choosing AKIN criteria over alternative reference standards (e.g., KDIGO).
12a	No	Cut-offs determined post hoc via Youden index: "optimal cutoff value to differentiate AKI or not." (Not pre-specified.)
12b	Yes	AKIN criteria for AKI staging were pre-specified: "AKI was determined using the AKIN criteria." (Pre-defined reference standard thresholds.)
13a	Yes	"Investigators who performed biomarkers analysis were blinded to AKI diagnosis." (Index test performers blinded to reference standard results.)
13b	No	No information on whether clinical information or index test results were available to AKIN assessors.
14	Yes	"Discrimination was assessed using the area under the receiver operating characteristic curve (AUC)." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data handling for index or reference tests.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No intended sample size calculation or justification provided.
19	No	No participant flow diagram included in the text.

20	Yes	"Demographic, clinical, and laboratory characteristics of participants" shown in Table 1.
21a	No	No distribution of disease severity (e.g., AKI stages beyond counts in Table 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No time interval reported between index test (biomarkers) and reference standard (AKIN criteria).
23	No	No cross-tabulation of index test results against reference standard (only AUC reported).
24	No	AUC values reported without confidence intervals or precision estimates.
25	No	No adverse events related to biomarker testing mentioned.
26	Yes	Limitations discussed: "biomarkers were measured only once... small sample size... single-center design."
27	Yes	"A promising panel of plasma calprotectin and NGAL as early diagnostic biomarkers for AKI." (Implications for practice stated.)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	"Data analysis was performed using SPSS version 22." (Sources of support mentioned, though funding details are incomplete.)

Doi 2011

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the receiver operating characteristic curves for L-type fatty acid-binding protein 0.75..." (Explicit use of AUC as a measure of diagnostic accuracy).
2	Yes	Structured abstract includes Objective, Design, Setting, Patients, Interventions, Measurements and Main Results, Conclusions.
3	Yes	Background describes AKI's clinical significance and limitations of serum creatinine, introducing urinary biomarkers for early detection.
4	Yes	"Objective: Biomarkers for detection of acute kidney injury and prediction of mortality..." (Clear objectives and hypotheses).
5	Yes	"Prospective observational cohort study" (Data collection planned before index/reference tests).
6	Yes	"Eligibility criteria: Adult patients ≥20 yrs admitted to ICU, excluding end-stage renal disease or transplant patients."
7	No	No explicit description of how potentially eligible participants were identified (e.g., based on symptoms or prior tests).
8	Yes	"Single-center study, 15-bed medical–surgical mixed ICU at a university hospital... December 2008 to May 2009."
9	No	No mention of consecutive, random, or convenience sampling; likely convenience series but not explicitly stated.
10a	Yes	Detailed urine collection protocols, freezing methods, and assay kits described for biomarker measurements.
10b	Yes	Reference standard: RIFLE criteria applied using serum creatinine changes and GFR estimates.
11	No	Rationale for choosing RIFLE over alternatives (e.g., AKIN) not provided.
12a	No	Cut-offs determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	RIFLE criteria pre-specified (50% creatinine increase from baseline).

13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve analysis... differences tested using DeLong's method."
15	No	No mention of handling indeterminate index or reference test results.
16	No	Missing data handling (e.g., excluded cases) not discussed.
17	No	No analysis of variability in accuracy across subgroups or pre-specified analyses.
18	No	Sample size justification (e.g., power calculation) absent.
19	No	No participant flow diagram; textual description only.
20	Yes	Table 1 summarizes demographics, comorbidities, and clinical characteristics.
21a	No	Severity distribution in AKI patients (e.g., RIFLE stages) not detailed.
21b	No	Alternative diagnoses in non-AKI patients not described.
22	No	Time interval between index test (ICU admission) and reference standard (daily creatinine) unclear.
23	No	No 2x2 contingency table comparing index test results against RIFLE criteria.
24	Yes	AUC values with 95% confidence intervals reported for all biomarkers.
25	No	Adverse events from biomarker testing not mentioned.
26	Yes	Limitations discussed: single-center design, heterogeneous population, and sample size.
27	Yes	"Implications for practice... biomarkers can serve as predictors of AKI and mortality."
28	No	No registration number or registry name provided.
29	No	Protocol accessibility not mentioned.
30	Yes	Funding sources and conflicts of interest disclosed in footnotes.

Constantin 2010

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity and specificity to predict AKI were 82% and 97%, respectively (area under the curve [AUC] = 0.92 [0.852-0.972]; P = .001)" – Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Purpose, Methods, Results, Conclusions.
3	Yes	Introduction describes AKI's clinical significance and NGAL's role as an early biomarker.
4	Yes	Objectives stated: "to determine... association between pNGAL and AKI" and "evaluate sensitivity and specificity."
5	Yes	"prospective-observational study" – Data collection planned before index/reference tests.
6	Yes	Exclusion criteria: "end-stage renal disease, recent transplantation, chronic kidney disease."

7	Yes	"All consecutive patients admitted to 3 ICUs" – Identified based on ICU admission.
8	Yes	"3 ICUs of the same institution during a 1-month period" – Specifies setting and dates.
9	Yes	"All consecutive patients" – Consecutive series.
10a	Yes	Detailed pNGAL methodology: "blood samples collected within 2 hours... analyzed with Triage Meter."
10b	Yes	RIFLE criteria defined: "50% increase in SCr from baseline... MDRD approach."
11	No	No rationale provided for choosing RIFLE over other AKI criteria (e.g., AKIN, KDIGO).
12a	No	Cutoff (155 nmol/L) derived from ROC analysis; not pre-specified (Methods mentions 150 pg/mL but adjusted post hoc).
12b	Yes	RIFLE criteria pre-specified: "Development of AKI was defined as... RIFLE criteria."
13a	Yes	"NGAL concentration was blinded to clinical staff... laboratory personnel blinded to AKI state."
13b	No	No explicit statement that RIFLE assessors were blinded to pNGAL results.
14	Yes	"ROC curve... AUC calculated" – Methods for diagnostic accuracy estimation.
15	No	No mention of handling indeterminate results (e.g., missing NGAL/RIFLE data).
16	No	No discussion of missing data handling.
17	No	No analysis of variability in accuracy (e.g., subgroups, pre-specified vs. exploratory).
18	No	Sample size determined by 1-month enrollment; no power calculation.
19	No	No participant flow diagram (text describes exclusion but no figure).
20	Yes	Table 1 reports demographics, clinical characteristics.
21a	Yes	Severity distribution: RIFLE groups with creatinine levels (e.g., "RIFLE 0-0... 98 ± 60 nmol/L").
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between pNGAL (ICU admission) and RIFLE assessment (daily) not explicitly addressed.
23	No	No cross-tabulation (2x2 table) of pNGAL vs. RIFLE results; only ROC/AUC reported.
24	Yes	"AUC = 0.92 [0.852-0.972]" – Accuracy estimates with confidence intervals.
25	No	No adverse events reported from pNGAL or RIFLE assessments.
26	Yes	Limitations: "small sample size... single-center study" in Discussion.
27	Yes	Conclusion states NGAL's role as "an early biomarker" for clinical use.
28	No	No registration number or registry name provided.
29	No	No mention of protocol availability.
30	Yes	Funding: "supported by the University Hospital of Clermont-Ferrand" in footnotes.

Van wolfswinkel 2016

Item	Assessment	Support for Assessment

No.		
1	Yes	"The predictive performance of NGAL and KIM-1 as markers for AKI was compared with that of serum creatinine... AUROC of 1.00 (95% CI 1.00–1.00)." (Abstract)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusion.
3	Yes	Background discusses AKI in malaria, limitations of creatinine, and roles of NGAL/KIM-1.
4	Yes	"This pilot study aims to explore the predictive performance... for AKI in travellers with imported P. falciparum infection." (Abstract)
5	Yes	"Measurements... were done using residual patient material... stored at −80 °C." (Methods) – retrospective design.
6	No	Eligibility criteria not explicitly detailed beyond inclusion in the cohort and sample availability.
7	Yes	"Patients diagnosed with malaria at the Institute for Tropical Diseases since 1998... from the Rotterdam Malaria Cohort." (Methods)
8	Yes	"Harbour Hospital... Rotterdam, The Netherlands... included patients diagnosed between 1998 and 2015." (Methods)
9	Yes	"39 patients... with available serum and urine samples" – convenience series. (Methods)
10a	Yes	"sNGAL, uNGAL, uKIM-1 measured using ELISA kits... stored at −80°C." (Methods)
10b	Yes	"AKI defined using KDIGO criteria... calculated baseline creatinine." (Methods)
11	Yes	"KDIGO criteria... suitable method by ADQI Group." (Definitions)
12a	Yes	"Optimal cut-off points were determined using the Youden index." (Statistical Analysis) – exploratory.
12b	Yes	KDIGO criteria pre-specified. (Definitions)
13a	No	No mention of blinding; samples were residual, likely unblinded.
13b	No	No mention of blinding for AKI assessors.
14	Yes	"ROC curves... AUROC, sensitivity, specificity, PPV, NPV with 95% CIs." (Results)
15	No	No discussion of indeterminate results handling.
16	No	Missing data not explicitly addressed beyond sample availability.
17	No	No variability analyses (e.g., subgroup comparisons).
18	No	No sample size justification; described as a pilot.
19	No	No flow diagram; text description only.
20	Yes	Table 1: "Baseline demographic and clinical characteristics."
21a	Yes	Table 2: KDIGO stages and progression in AKI patients.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No time interval specified between index test and reference standard.
23	No	No 2x2 table; only AUROC and predictive values reported.
24	Yes	"AUROC of 1.00 (95% CI 1.00–1.00)... 95% confidence intervals." (Results)
25	No	No adverse events reported.
26	Yes	"Study limitations... small sample size... generalisability." (Conclusion)

27	Yes	"Larger studies are needed to demonstrate... clinical role." (Conclusion)
28	No	No registration number or registry name provided.
29	No	No protocol accessibility mentioned.
30	No	Funding sources not specified beyond CC license.

Liangos 2009

Item No.	Assessment	Support for Assessment
1	Yes	"Urinary KIM-1 achieved the highest area under-the-receiver-operator-characteristic curve (AUC = 0.78, 95% CI 0.64-0.91)" (Abstract). Explicitly uses AUC, a measure of diagnostic accuracy.
2	Yes	Abstract includes structured sections: purpose, methods, results, and conclusions. Example: "The purpose of this study was to compare..." (Abstract).
3	Yes	Introduction describes clinical context of AKI and the need for early biomarkers, including intended use of the index tests (e.g., "early detection of AKI") (Introduction).
4	Yes	"The objective of this pilot study was to compare the performance characteristics..." (Introduction). Clear study objectives.
5	Yes	"This ancillary prospective cohort study..." (Subjects and Methods). Data collection was planned prospectively.
6	Yes	Inclusion/exclusion criteria detailed: "age 18 years or greater... exclusion criteria were age under 18... off-pump surgery..." (Subjects and Methods).
7	Yes	Participants identified based on undergoing on-pump cardiac surgery (clinical context): "All consecutive adult subjects... scheduled to undergo on-pump cardiac surgery" (Subjects and Methods).
8	Yes	"conducted between January 2004 and May 2006 at two tertiary care hospitals..." (Subjects and Methods). Location and dates specified.
9	Yes	"All consecutive adult subjects... were eligible for enrollment" (Subjects and Methods). Consecutive series confirmed.
10a	Yes	Index tests (urinary biomarkers) described in detail: measurement methods, assays, normalization to creatinine (Subjects and Methods).
10b	Yes	Reference standard (serum creatinine ≥50% rise within 72h) defined explicitly (Subjects and Methods).
11	Yes	Rationale for serum creatinine as reference: "relied on serum creatinine... imperfect marker... hemodilution accounted for" (Introduction and Methods).
12a	No	Cut-offs determined post-hoc using Youden index: "Optimal cut-off points... determined... using the Youden index" (Methods). Not pre-specified.
12b	Yes	Reference standard positivity (≥50% serum creatinine rise) pre-defined using AKI Network criteria (Methods).
13a	Yes	"measurements were performed... by blinded investigators" (Methods). Clinical/reference data likely blinded for index test.
13b	Unclear	No explicit statement on whether index test results were available to reference standard assessors. Assumed "No" due to lack of detail.
14	Yes	"ROC analysis... AUC calculated... DeLong method for statistical testing" (Methods). Appropriate accuracy measures.
15	No	No mention of handling indeterminate index test or reference standard results (e.g., missing creatinine measurements).

16	No	No explicit description of handling missing data for biomarkers or reference standard (e.g., exclusion criteria for missing samples).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses or pre-specified variability assessments).
18	No	No sample size justification: "this small pilot-cohort" (Abstract) implies no formal power calculation.
19	No	No participant flow diagram provided in the manuscript text.
20	Yes	"Baseline demographic and clinical characteristics" table in Results (e.g., age, gender, CCF score).
21a	No	No distribution of disease severity in AKI patients (e.g., staging or AKI severity beyond binary classification).
21b	No	No distribution of alternative diagnoses in non-AKI patients (not applicable as study focuses on AKI vs. non-AKI).
22	Yes	Time interval clarified: biomarkers measured 2h post-CPB; reference standard assessed within 72h (Methods).
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results in Results.
24	Yes	AUC estimates with 95% CIs reported (e.g., "AUC = 0.78, 95% CI 0.64-0.91") (Abstract and Results).
25	No	No mention of adverse events related to biomarker testing or reference standard.
26	Yes	Limitations discussed: "small pilot-cohort... Larger studies are needed" (Abstract and Discussion).
27	Yes	Implications stated: "KIM-1 performed best... Larger studies needed" (Abstract) and clinical relevance in Discussion.
28	No	No registration number or registry name provided.
29	No	No statement on availability of the full study protocol.
30	Yes	Funding sources: "NIH Public Access" and conflicts of interest disclosed (Declaration of Interest).

Parikh 2011

Item No.	Assessment	Support for Assessment
1	Yes	"The clinical prediction model for AKI had an area under the receiver-operating characteristic curve (AUC) of 0.69. Urine IL-18 and plasma NGAL significantly improved the AUC to 0.76 and 0.75, respectively." (Explicit use of AUC as a diagnostic accuracy measure.)
2	Yes	The ABSTRACT provides a structured summary of design, methods, results, and conclusions (e.g., "prospective, multicenter cohort study...1219 adults...evaluate whether early postoperative measures...could identify AKI").
3	Yes	"Despite decades of research, no therapy has proven effective for human AKI...serum creatinine is a measure of clearance...consensus conferences have called for a better clinical paradigm using new biomarkers." (Describes clinical need and intended use of biomarkers.)
4	Yes	"Study objectives: evaluate whether early postoperative measures...could identify which patients would develop AKI." (Explicit objective stated in ABSTRACT.)
5	Yes	"Prospective, multicenter cohort study" (Data collection planned before index test and reference standard were performed.)
6	No	Eligibility criteria (e.g., exclusion criteria) are not explicitly detailed beyond "adults undergoing cardiac surgery."
7	Yes	Participants were identified based on undergoing cardiac surgery ("1219 adults undergoing cardiac surgery").

8	No	No specific dates or detailed settings provided beyond "multicenter cohort study" and institutional affiliations.
9	No	No mention of whether participants were consecutive, random, or a convenience series.
10a	Yes	"Urine IL-18, urine NGAL, and plasma NGAL levels peaked within 6 hours after surgery" (Index tests described with timing and biomarkers specified.)
10b	Yes	"AKI defined by receipt of acute dialysis or doubling of serum creatinine" (Reference standard clearly defined.)
11	Yes	"Large consensus conferences have called for a better clinical paradigm...using new plasma and urine biomarkers" (Rationale for reference standard based on clinical consensus.)
12a	No	Biomarker cut-offs (quintiles) were exploratory; no pre-specified thresholds mentioned.
12b	Yes	"AKI defined by receipt of acute dialysis or doubling of serum creatinine" (Pre-specified criteria per consensus definitions.)
13a	No	No information on whether reference standard results (AKI status) were available to biomarker testers.
13b	No	No information on whether biomarker results were available to AKI assessors.
14	Yes	"Methods for estimating...AUC, NRI, IDI" (Statistical methods for diagnostic accuracy explicitly described.)
15	No	No mention of handling indeterminate biomarker or AKI results.
16	No	No description of missing data handling for biomarkers or AKI outcomes.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No stated sample size calculation or power analysis.
19	Yes	"Flow of study population" (Figure 1 details participant inclusion/exclusion.)
20	Yes	"Baseline demographic and clinical characteristics" (Table 1 provides detailed participant characteristics.)
21a	No	No distribution of AKI severity (e.g., stages) in the target population.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No explicit time interval reported between biomarker measurement and AKI diagnosis.
23	No	No cross-tabulation of biomarker results vs. AKI outcomes (e.g., 2x2 table).
24	Yes	"AUC of 0.69...improved to 0.76 and 0.75...95% confidence intervals" (Accuracy estimates with precision reported.)
25	No	No mention of adverse events from biomarker testing or AKI assessment.
26	Yes	"Study limitations...statistical uncertainty and generalizability" (Limitations discussed in the manuscript.)
27	Yes	"Implications for practice...earlier diagnosis of AKI" (Clinical role of biomarkers emphasized in ABSTRACT.)
28	Yes	"ClinicalTrials.gov number, NCT00774137" (Registration number provided.)
29	No	No statement about access to the full study protocol.
30	No	Funding sources listed in affiliations, but no explicit role of funders described.

Nickolas 2008

Item	Assessment	Support for Assessment

No.		
1	Yes	"sensitivity and specificity of NGAL for detecting acute injury were 0.900 (95% CI, 0.73 to 0.98) and 0.995 (CI, 0.990 to 1.00)... positive and negative likelihood ratios" (Results). Explicitly reports diagnostic accuracy measures.
2	Yes	Structured abstract includes Background, Objective, Design, Setting, Participants, Measurements, Results, Limitations, Conclusion.
3	Yes	Background discusses limitations of serum creatinine and rationale for NGAL as a biomarker for acute kidney injury, including its clinical role.
4	Yes	"Our hypothesis was that a single measurement of urinary NGAL is superior to conventional and novel biomarkers..." (Background). Objectives stated in Abstract.
5	Yes	"Prospective cohort study" (Design). Data collection planned before index/reference tests.
6	Yes	Inclusion: Adults ≥18 y with altered kidney function; exclusion: Hemodialysis patients or those without follow-up creatinine (Methods).
7	Yes	Participants identified via "symptoms, results from previous tests" (e.g., elevated creatinine) in the emergency department (Methods).
8	Yes	"Emergency department of Columbia University Medical Center... March to August 2007" (Setting).
9	Yes	"Consecutive patients" recruited (Methods).
10a	Yes	Index test (urinary NGAL) described: measured via immunoblot, cutoff 130 µg/g creatinine (Methods, Results).
10b	Yes	Reference standard: RIFLE criteria for acute kidney injury, adjudicated by blinded clinicians (Methods).
11	Yes	RIFLE is the "best available method" for defining acute kidney injury (Background).
12a	Yes	Pre-specified cutoff of 130 µg/g creatinine with rationale (Results: "superior... likelihood ratios").
12b	Yes	RIFLE criteria (pre-specified reference standard) defined in Methods.
13a	Yes	"Researchers who were blinded to experimental measurements" assigned diagnoses (Methods).
13b	Yes	Reference standard assessors blinded to NGAL results (Measurements: "blinded to experimental measurements").
14	Yes	"Sensitivity, specificity, likelihood ratios, AUC" calculated (Results).
15	No	No explicit mention of handling indeterminate index/reference test results.
16	No	Excluded patients without follow-up creatinine but did not describe methods for handling missing data.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroups or pre-specified analyses).
18	No	No stated sample size calculation or justification.
19	Yes	Figure 1 shows participant flow (exclusions, enrollment, final groups).
20	Yes	"Baseline demographic and clinical characteristics" described in Results.
21a	No	Severity distribution in acute kidney injury group not detailed (e.g., RIFLE stages).
21b	No	Alternative diagnoses in non-target condition groups (e.g., prerenal azotemia) not explicitly distributed.
22	No	Time interval between index test (NGAL) and reference standard (RIFLE) not specified.
23	Yes	Cross-tabulation implied by sensitivity/specificity calculations (Results).
24	Yes	"95% confidence intervals" reported for accuracy measures (Results).
25	No	No mention of adverse events from NGAL or reference tests.

26	Yes	Limitations: Single-center, few biopsies (Abstract and Limitations).
27	Yes	Conclusion states NGAL "helps distinguish acute injury" and predicts outcomes (implications for practice).
28	No	No registration number or registry name provided.
29	Yes	"Study protocol... available by written agreement from Dr. Nickolas" (Reproducible Research Statement).
30	Yes	Funding sources, conflicts of interest, and institutional licensing disclosed (Disclaimer, Potential Financial Conflicts).

Cuartero 2017

Item No.	Assessment	Support for Assessment
1	Yes	"AUROC curve to predict AKI... sensitivity 73.5%, specificity 71.4%, $p < 0.0001$."
2	Yes	Abstract includes structured sections: Purpose, Methods, Results, Conclusions.
3	Yes	Background discusses AKI diagnosis challenges and the role of TIMP-2/IGFBP7 as early biomarkers.
4	Yes	"To analyse the usefulness of the composite index... for the early prediction of AKI."
5	Yes	"This is a prospective, observational study."
6	Yes	Inclusion criteria: ICU admission, expected stay >48h; exclusion: CKD, hospitalization >48h prior.
7	Yes	"patients admitted to ICU from acute care departments and hospital length of stay <48h."
8	Yes	"recruited 100 consecutive patients... from June 2011 to April 2013."
9	Yes	"We recruited 100 consecutive patients fulfilling the admission criteria."
10a	Yes	Detailed urine sample handling: centrifugation, freezing, assay method (Nephrocheck®).
10b	Yes	Reference standard: AKIN criteria based on sCr and urine output.
11	Yes	AKIN is a recognized standard for AKI diagnosis.
12a	Yes	"cut-offs proposed in previous studies" (0.3 and 2.0 $(ng/mL)^2/1000$).
12b	Yes	AKIN stages (1-3) defined by sCr and urine output criteria.
13a	No	"healthcare providers involved were blinded to the biomarkers results." No mention of clinical/reference data availability to index test performers.
13b	No	Blinding implies reference standard assessors (AKIN) did not have access to index test results.
14	Yes	"AUROC curve... sensitivity, specificity, PPV, NPV."
15	No	No mention of indeterminate index/reference standard results handling.
16	Yes	"Two patients were excluded... because one of their samples was missing."
17	Yes	Pre-specified subgroup analysis: "secondary objective... evaluate usefulness in septic patients."
18	No	No sample size justification or power calculation provided.
19	Yes	"Fig. 1 Diagram of [TIMP-2]·[IGFBP7] index to predict AKI, study enrolment."

20	Yes	Table 1 reports demographics, clinical scores, and baseline characteristics.
21a	Yes	"AKIN criteria" used to stratify AKI severity (Fig. 2).
21b	No	No distribution of alternative diagnoses in non-AKI patients provided.
22	No	Time interval between index test and reference standard not specified.
23	No	No cross-tabulation (2x2 table) of index vs. reference results provided.
24	Yes	"AUROC 0.798 (95% CI), sensitivity 73.5%, specificity 71.4%."
25	No	No adverse events reported from urine collection or testing.
26	Yes	Limitations: single-center design, small sample size, no long-term outcomes.
27	Yes	"urinary [TIMP-2]·[IGFBP7] was an early predictor... ruled out the need for renal replacement."
28	No	No trial registration number or registry name provided.
29	No	No statement on full study protocol accessibility.
30	Yes	"Acknowledgements... supported by Astute Medical (provided kits)."

Manabe 2012

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver operating characteristic analysis showed that baseline urinary L-FABP level exhibited 82% sensitivity and 69% specificity, at a cut-off value of 24.5 μg/g Cr." (Results section).
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction describes CI-AKI as a clinical problem and L-FABP's role as a predictive biomarker.
4	Yes	"We prospectively investigated whether urinary L-FABP is a suitable marker for the prediction of CI-AKI." (Abstract).
5	Yes	"We performed a prospective study of 220 consecutive patients..." (Methods).
6	Yes	Inclusion/exclusion criteria detailed in "Patients" subsection (e.g., serum Cr ≥1.2 mg/dL, exclusion of emergency cases).
7	Yes	Patients identified based on "chronic kidney disease" and scheduled for elective catheterization (Methods).
8	Yes	"Kansai Medical University, Hirakata Hospital, Hirakata, Japan" and enrollment period (Sep 2006–Dec 2008) (Methods).
9	Yes	"220 consecutive patients" (Methods).
10a	Yes	Urinary L-FABP measurement details: ELISA kit, timing (before and 1–2 days post-procedure) (Methods).
10b	Yes	Reference standard: Serum Cr increase ≥0.3 mg/dL within 48h (Study Purpose).
11	Yes	CI-AKI definition aligns with established criteria (Study Purpose).
12a	No	L-FABP cut-off (24.5 μg/g Cr) derived post hoc via ROC analysis, not pre-specified.
12b	Yes	Predefined CI-AKI threshold: "increase in serum Cr level of ≥0.3 mg/dL within 48h" (Study Purpose).

13a	No	No mention of blinding index test assessors to reference standard results.
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	ROC analysis, sensitivity, specificity, AUC, and multivariate logistic regression (Results).
15	No	No description of handling indeterminate test results.
16	No	No discussion of missing data management.
17	No	Variability analyses (e.g., subgroup analyses) not explicitly addressed.
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram; only text descriptions.
20	Yes	Table 1 lists baseline demographics and clinical characteristics.
21a	No	Severity distribution of CI-AKI not detailed (e.g., Cr levels stratified by severity).
21b	No	No distribution of alternative diagnoses in non-CI-AKI patients.
22	Yes	"Serum Cr levels measured immediately before and 1 and 2 days after the procedure" (Methods).
23	No	No 2x2 table cross-tabulating index test vs. reference standard results.
24	Yes	"82% sensitivity, 69% specificity, AUC 0.70, 95% CI for odds ratios" (Results).
25	No	No adverse events reported.
26	Yes	Limitations discussed: single-center, small sample size (Discussion).
27	Yes	"Urinary L-FABP level is useful for predicting CI-AKI before contrast exposure" (Conclusions).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	No	Funding sources not explicitly stated in the provided text.

Aydoğdu 2013

Item No.	Assessment	Support for Assessment
1	Yes	"Urinary NGAL showed significant discrimination for AKI diagnosis (AUC 0.80) with a threshold value of 29.5 ng/ml (88% sensitivity, 73% specificity)" (Abstract). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Structured abstract includes AIM, METHODS, RESULTS, and CONCLUSIONS sections (Abstract).
3	Yes	"To assess and compare the roles of [...] for early diagnosis of septic acute kidney injury" (Abstract). Background in Introduction describes clinical role of NGAL/Cystatin C vs. creatinine.
4	Yes	"AIM: To assess and compare [...] for early diagnosis of septic AKI" (Abstract). Objectives clearly stated.
5	Yes	"A prospective cohort study [...] between January 2008 and March 2010" (Methods). Prospective data collection confirmed.

6	Yes	Inclusion/exclusion criteria detailed under "Patient selection" (Methods).
7	Yes	Patients identified based on ICU admission with sepsis/AKI status (Methods: "patients admitted to our ICU").
8	Yes	"Performed in a seven beds pulmonary ICU of a university hospital [...] between January 2008 and March 2010" (Methods).
9	Yes	"Patients were included in the study consecutively" (Methods: Patient selection).
10a	Yes	NGAL/Cystatin C measurement methods described in detail: "enzyme linked immunosorbent assay [...] frozen at −80°C" (Methods: Sample collection).
10b	Yes	Reference standard defined as RIFLE criteria: "AKI [...] defined according to RIFLE criteria" (Methods: Definitions).
11	No	No rationale provided for choosing RIFLE criteria over alternatives (e.g., AKIN).
12a	Yes	Cut-offs defined with ROC analysis: "threshold value of 29.5 ng/ml" (Abstract), "1.5 and 0.106 mg/L" (Abstract).
12b	No	RIFLE criteria cut-offs not explicitly defined or justified.
13a	Unclear	Not reported whether reference standard results were available to index test assessors.
13b	Unclear	Not reported whether index test results were available to reference standard assessors.
14	Yes	"ROC curves were used [...] area under ROC curves (AUC)" (Methods: Statistical analysis).
15	No	No description of handling indeterminate/missing test results.
16	No	No mention of missing data handling methods.
17	No	No analysis of variability in diagnostic accuracy reported.
18	No	No sample size calculation or justification provided.
19	Yes	"Flow-chart showing numbers of screened/excluded/analyzed patients" (Fig. 1).
20	Yes	"Demographic properties [...] summarized in Table 1" (Results).
21a	No	No distribution of disease severity in AKI patients reported.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Samples collected "within first 24 hours [...] until ICU discharge" (Methods). Time intervals specified.
23	No	No 2x2 contingency table or cross-tabulation of test results.
24	Yes	"AUC 0.80 [...] 88% sensitivity, 73% specificity" (Abstract). Precision metrics (e.g., 95% CIs) missing.
25	No	No mention of adverse events from tests.
26	Yes	"Plasma NGAL raises in sepsis without AKI [...] should be used with caution" (Conclusion). Limitations discussed.
27	Yes	"Useful markers in predicting AKI" (Conclusion). Implications for clinical use stated.
28	No	No registration number or registry name reported.
29	No	No protocol accessibility statement.
30	Yes	Funding: "The ethic committee of our institution approved the study" (Methods). No explicit funding source disclosed.

Introcaso 2018 Here is the extracted table with the specified columns:

Item No.	Assessment	Support for Assessment
1	Yes	"Analysis of post-operative NGAL values demonstrated an AUC of 0.71, 95% CI (0.60 - 0.82)... sensitivity = 76%, specificity = 59%." (Explicitly reports AUC, sensitivity, and specificity as diagnostic accuracy measures.)
2	Yes	Abstract includes structured sections: Introduction, Materials and methods, Results, Conclusions.
3	Yes	Introduction describes AKI as a severe postoperative complication and NGAL's role as a biomarker for early prediction.
4	Yes	"The aim of this study was to investigate the usefulness as diagnostic value of plasma NGAL..." (Objectives stated in Introduction).
5	Yes	"Between January 2014 and September 2015, 92 consecutive patients... were prospectively enrolled." (Prospective design explicitly stated).
6	Yes	Inclusion criteria listed: "Patients presenting two or more of the following criteria..." (Age >70, eGFR <60, etc.).
7	Yes	Participants identified based on "patients undergoing cardiac surgery" with specific AKI risk factors (Materials and methods).
8	Yes	"Centro Cardiologico Monzino" (location) and "January 2014 to September 2015" (dates) specified.
9	Yes	"92 consecutive patients" enrolled (consecutive series explicitly stated).
10a	Yes	NGAL measurement details: "Triage Meter NGAL Test, Biosite... fluorescence-based immunoassay," including sample handling procedures.
10b	Yes	Reference standard: KDIGO criteria using sCrea and urine output, with methodology for sCrea measurement described.
11	Yes	"KDIGO criteria... represents the gold standard for AKI diagnosis." (Rationale for reference standard provided).
12a	No	Cut-off (154 ng/mL) derived post hoc using Euclidean distance; no pre-specified rationale.
12b	Yes	KDIGO criteria define pre-specified AKI stages based on sCrea/urine output thresholds.
13a	Unclear	Not explicitly stated whether reference standard results were available to NGAL testers. Assumed "No" due to lack of description.
13b	Unclear	Not explicitly stated whether NGAL results were available to reference standard assessors. Assumed "No."
14	Yes	"ROC curves... AUC with 95% CI... sensitivity, specificity, NPV" reported (Methods for accuracy estimation described).
15	No	No mention of handling indeterminate index test or reference standard results.
16	Yes	"23 had missing results or clinical data and were excluded." (Handling of missing data described).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size calculation or justification provided.
19	Yes	Flow diagram provided (Figure 1) showing participant inclusion/exclusion.
20	Yes	Baseline demographics and clinical characteristics summarized in Table 1.
21a	Partial	AKI severity distribution (stages 1-3) mentioned in Results but not fully tabulated. Marked "No" due to incomplete reporting.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals specified: NGAL measured "within 4h after ICU arrival"; sCrea measured "10-18h after surgery."
23	No	No 2x2 contingency table comparing index test vs. reference standard results.
24	Yes	"AUC of 0.71, 95% CI (0.60 - 0.82)... sensitivity 86%, NPV 87%" (Accuracy estimates with precision reported).
25	No	No mention of adverse events from NGAL or sCrea testing.

26	Yes	Limitations discussed: "poor specificity... analytical variability of NGAL."
27	Yes	"NGAL may be useful for timely treatment or AKI rule-out in ICU patients." (Implications for practice stated).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	Funding: "Centro Cardiologico Monzino, IRCCS." Declared under author affiliations.

Qian 2019

Item No.	Assessment	Support for Assessment
1	Yes	"The AUC of detecting AKI for urine Klotho was higher than urine NGAL...", "sensitivity 93.9%, specificity 75.9%" (Results). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background describes AKI's clinical challenges and Klotho's biological role.
4	Yes	"evaluated the diagnostic and prognostic roles of urine Klotho" (Abstract).
5	Yes	"prospective study" (Methods).
6	Yes	Exclusion criteria: CKD, thyroid disease, pre-existing infections, missing data (Methods).
7	Yes	Participants identified as patients undergoing cardiac surgery (Methods).
8	Yes	"Renji Hospital... between 1st October 2012 and 30th June 2013" (Methods).
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	"urine Klotho using ELISA kits... corrected for urine creatinine" (Methods).
10b	Yes	AKI defined by AKIN criteria (SCr increase) (Methods).
11	No	AKIN used but no rationale provided for choosing it over alternatives.
12a	No	Cut-offs determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	AKIN criteria are pre-defined (≥0.3 mg/dl or 50% SCr increase).
13a	Yes	"detected by a technician with a blind method" (Methods).
13b	No	No information on whether SCr assessors were blinded to Klotho results.
14	Yes	"ROC curve... AUC was calculated" (Methods).
15	No	No description of handling indeterminate test results.
16	Yes	Excluded 7 patients with missing data (Results).
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	No sample size justification or power calculation mentioned.

19	No	No participant flow diagram; textual description only.
20	Yes	Table 1 details demographics and clinical characteristics.
21a	Yes	AKI stages 1–3 reported (Results).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time intervals between index test and reference standard not explicitly stated.
23	No	No 2x2 contingency table of Klotho vs. AKIN results.
24	Yes	AUCs with 95% CIs reported (Table 2).
25	No	No adverse events from Klotho or NGAL testing mentioned.
26	Yes	Limitations: single-center, small sample size (Discussion).
27	Yes	"Urine Klotho may serve as an early biomarker" (Conclusions).
28	No	No trial registration number provided.
29	No	No mention of a publicly available study protocol.
30	Yes	Funding: Shanghai Natural Science Foundation; role of funders stated (End of article).

Cruz 2010

Item No.	Assessment	Support for Assessment
1	Yes	"Plasma NGAL was a good diagnostic marker for AKI development within the next 48 h (area under ROC 0.78, 95% CI 0.65–0.90)" (Explicitly reports AUC, a measure of diagnostic accuracy).
2	Yes	Abstract includes structured sections: Purpose, Methods, Results, Conclusions.
3	Yes	"Lack of early AKI biomarkers... NGAL is a promising biomarker" (Describes clinical need and role of NGAL).
4	Yes	"The main objective... was to estimate the diagnostic accuracy of plasma NGAL... for early detection of AKI" (Clear objectives/hypotheses).
5	Yes	"Prospective observational study" (Explicitly states prospective design).
6	Yes	"Consecutive adult patients admitted to a general ICU... excluded 5 patients with ESRD" (Eligibility criteria defined).
7	Yes	"Consecutive adult patients admitted to a general ICU" (Participants identified based on ICU admission).
8	Yes	"ICU from January to July 2007" (Setting, location, and dates specified).
9	Yes	"307 consecutive adult patients" (Consecutive series explicitly stated).
10a	Yes	"Plasma NGAL measured using Triage® NGAL Test... blood samples processed within 1 h" (Detailed index test methodology).
10b	Yes	"AKI defined using RIFLE criteria... baseline creatinine defined" (Reference standard clearly described).
11	No	No rationale provided for choosing RIFLE over other AKI definitions (e.g., KDIGO).
12a	No	ROC-derived cutoffs used, but no pre-specified positivity thresholds mentioned (exploratory analysis).

12b	Yes	RIFLE criteria (pre-specified severity categories) used as reference standard.
13a	Yes	"Laboratory investigators were blinded to... clinical information" (No clinical bias in index test).
13b	No	Unclear if RIFLE assessors were blinded to NGAL results (not explicitly stated).
14	Yes	"ROC curves... sensitivity, specificity, AUC, 95% CI" (Appropriate accuracy metrics).
15	No	No mention of handling indeterminate NGAL or RIFLE results.
16	No	Excluded 1 patient for "uninterpretable NGAL," but no broader missing data protocol described.
17	No	Analyzed NGAL variability over time but did not distinguish pre-specified vs. exploratory analyses.
18	No	No sample size calculation or power analysis provided.
19	No	No participant flow diagram in the main text (supplementary material not accessible for verification).
20	Yes	Table 1 details demographics, comorbidities, and clinical characteristics.
21a	No	Mentions AKI severity (RIFLE classes) but no distribution of disease severity (e.g., staging by organ failure).
21b	No	No distribution of alternative diagnoses in non-AKI patients provided.
22	No	Timing of NGAL testing relative to RIFLE assessment not explicitly described (e.g., daily sampling vs. event-based).
23	No	No 2x2 contingency table comparing NGAL results with RIFLE outcomes.
24	Yes	"AUC 0.78 (95% CI 0.65–0.90)" (Accuracy estimates with precision).
25	No	No adverse events from NGAL testing or RIFLE application reported.
26	Yes	"Study limitations... single-center design, heterogeneous population" (Discussed in Conclusions).
27	Yes	"Early identification of high-risk patients may allow... therapies to be initiated early" (Clinical implications stated).
28	No	No registration number or registry name provided.
29	No	Full protocol access not mentioned (supplementary methods described briefly).
30	Yes	"Supported by... IRB approval... Biosite Inc. provided NGAL assays" (Funding and support disclosed).

Lakhal 2021

Item No.	Assessment	Support for Assessment
1	Yes	"The performance of urine tissue inhibitor of metalloproteinase 2 insulin-like growth factor-binding protein 7 (TIMP2 IGFBP7) has never been compared with that of very early changes in plasma creatinine (ΔpCr)... AUCROC of 0.84 [95%CI:0.73–0.92] vs. ≤0.67 [95%CI:0.54–0.78]." Explicitly compares diagnostic accuracy using AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background section describes CS-AKI clinical context, limitations of pCr, and intended use of novel biomarkers.
4	Yes	"We hypothesized that... lack of postoperative decrease in pCr would be of honourable performance... We therefore aimed at comparing these

		biomarkers..." States objectives and hypotheses.
5	Yes	"Patients... were prospectively and consecutively included..." Prospective study design.
6	Yes	"Adults over 75 years-old undergoing elective surgical aortic valve replacement with cardiopulmonary bypass (CPB)" and exclusion criteria listed.
7	Yes	"Eligible patients were identified on the schedule of operations, before the preoperative anesthesia consultation."
8	Yes	"Included over 2 periods (November 2012–February 2013 and February 2016–January 2017)" specifies setting and dates.
9	Yes	"prospectively and consecutively included." Consecutive series confirmed.
10a	Yes	Detailed methods for TIMP2 IGFBP7, pCr, pNGAL, pCysC, and pUrea measurements provided.
10b	Yes	Reference standard: KDIGO criteria for CS-AKI ("increase in pCr of ≥26.5 µmol/L...").
11	Yes	KDIGO guidelines cited as the reference standard, consistent with current clinical practice.
12a	Yes	"For TIMP2 IGFBP7, the proposed threshold of 0.3 $(ng/mL)^2/1000$ was tested." Pre-specified cut-off.
12b	Yes	KDIGO criteria define positivity for CS-AKI (pre-specified thresholds).
13a	No	No explicit statement on blinding of index test performers to reference standard results.
13b	No	No mention of whether assessors of KDIGO criteria were blinded to index test results.
14	Yes	"AUCROC was determined... compared [14]... sensitivity, specificity, predictive values calculated."
15	No	Unclear how indeterminate results (e.g., missing biomarker values) were handled beyond stating "no data imputation."
16	Yes	"No data imputation was performed." Explicitly addresses missing data.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Partial/No	"Funding capacity... allowed measurements in 65 patients." Sample size justified pragmatically, not statistically. Assessment: No (no formal power calculation).
19	Yes	Figure 1 depicts participant flow (exclusions and outcomes).
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	No	Severity distribution of CS-AKI (e.g., stage 1 vs. stage 2) not detailed beyond counts.
21b	No	No distribution of alternative diagnoses in non-CS-AKI patients.
22	Yes	Biomarkers measured at specific time points (pre-CPB, post-CPB, H6, Day1).
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUCROC of 0.84 [95%CI:0.73–0.92]... sensitivity, specificity, predictive values."
25	No	Adverse events from tests not mentioned.
26	Yes	"Study limitations... confirmatory studies... required." Discusses generalizability and bias.
27	Yes	"Implications for practice... if pCr failed to decline... CS-AKI was likely."
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	"Sources of funding... Creative Commons licence... role of funders" declared.

Sun 2017

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver operating characteristics (ROC) analysis was used to calculate the area under the curve (AUC) for NGAL and KIM-1." (Methods). Explicit use of AUC as a diagnostic accuracy measure.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction describes AKI's clinical significance and the role of NGAL/KIM-1 as novel biomarkers.
4	Yes	"The aim of this study is to investigate... NGAL and KIM-1 for AKI" (Abstract). Clear objective.
5	No	No explicit statement on prospective/retrospective data collection. Mentions enrollment from 2014–2015 but lacks planning details.
6	Yes	"Inclusion/exclusion criteria: confirmed scrub typhus, excluded transferred patients/concomitant infections" (Methods).
7	Yes	Participants identified via "positive IgM ELISA for scrub typhus in patients with acute febrile illness and rash" (Methods).
8	Yes	"Presbyterian Medical Center, Jeonju, South Korea" and "2014–2015" (Methods).
9	No	No mention of consecutive, random, or convenience sampling. States "138 patients were enrolled" without methodology details.
10a	Yes	Detailed ELISA methods for NGAL/KIM-1: "human NGAL ELISA kit... stored at –80℃" (Methods). Replicable.
10b	No	RIFLE criteria mentioned but lacks specifics on urine output thresholds or baseline creatinine determination (assumed eGFR). Insufficient for replication.
11	No	No rationale provided for choosing RIFLE over other AKI criteria (e.g., AKIN).
12a	No	NGAL/KIM-1 cutoffs determined post hoc via ROC analysis (exploratory, not pre-specified).
12b	Yes	RIFLE criteria (Risk, Injury, Failure) are pre-defined and applied as reference standard.
13a	No	No information on whether reference standard results were available to index test assessors.
13b	No	No information on whether index test results influenced reference standard assessment.
14	Yes	"ROC analysis... AUC for NGAL and KIM-1" (Methods). Appropriate accuracy measures.
15	No	No mention of handling indeterminate results (e.g., missing biomarker values).
16	No	No description of missing data management for NGAL/KIM-1 or RIFLE.
17	No	No analysis of variability in accuracy estimates (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram.
20	Yes	Table 1 lists demographics, comorbidities, and clinical characteristics.
21a	No	AKI severity distributed via RIFLE (Table 3) but lacks severity details (e.g., etiology, complications).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No discussion of time intervals between index tests and RIFLE application.

23	No	No 2x2 table cross-tabulating NGAL/KIM-1 results against RIFLE.
24	No	AUC reported but without 95% confidence intervals (e.g., "P<0.001" only).
25	No	No adverse events reported from NGAL/KIM-1 testing or RIFLE.
26	Yes	Limitations: "small sample size... single-center study" (Discussion).
27	Yes	Conclusion states "serum NGAL might be an additive predictor," implying clinical utility.
28	No	No trial registration number or registry name.
29	No	No mention of protocol availability.
30	Yes	Funding sources: "Korean Society of Nephrology... Presbyterian Medical Center" (Declarations).

Qin 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The estimated sensitivity and specificity of uIL-18... were 0.64 (95% CI: 0.54–0.73) and 0.77 (95% CI: 0.71–0.83)... AUC: 0.78 (95% CI: 0.74–0.81)" (Explicitly reports diagnostic accuracy measures).
2	Yes	Structured abstract with "Aims," "Methods," "Results," and "Conclusions" sections (STARD for Abstracts compliance).
3	Yes	Introduction describes AKI diagnostic limitations, clinical role of uIL-18, and its potential as an early biomarker.
4	Yes	"The aim of this study was to systematically review... to evaluate the value of uIL-18 in predicting AKI" (clear objective and hypothesis).
5	No	Study is a meta-analysis of existing studies; no explicit mention of prospective/retrospective data collection planning in original studies.
6	Yes	Inclusion/exclusion criteria: "English language," "studies could not provide the diagnosis value of uIL-18 were excluded."
7	No	Eligibility basis (e.g., symptoms, prior tests) for participants in original studies not detailed in the meta-analysis.
8	No	Settings/locations of included studies listed (e.g., USA, China) but no specific dates or recruitment periods provided.
9	No	Participant selection method (consecutive, random, convenience) in original studies not reported.
10a	Yes	"IL-18 concentration by enzyme-linked immunosorbent assay (ELISA)... stored at −80°C" (index test details for replication).
10b	Yes	Reference standard: AKI defined by SCr/urine volume criteria (e.g., RIFLE, AKIN) described across studies.
11	No	Rationale for choosing SCr/urine volume as reference standard not explicitly discussed.
12a	Yes	"Cutoff value with the highest product of specificity and sensitivity was used" (pre-specified positivity rationale).
12b	No	No discussion of reference standard cut-offs (e.g., SCr thresholds) or their rationale.
13a	No	Blinding of index test performers to reference standard results not mentioned.
13b	No	Blinding of reference standard assessors to index test results not addressed.
14	Yes	"Bivariate random-effects regression model... pooled sensitivity, specificity, SROC, AUC" (statistical methods described).
15	No	Handling of indeterminate/missing index/reference test results not specified.

16	No	Missing data handling (e.g., exclusions) not explicitly described.
17	No	No analysis of variability in diagnostic accuracy (e.g., thresholds, subgroups pre-specified).
18	No	Intended sample size/power calculation for individual studies not reported.
19	Yes	PRISMA flowchart (Figure 1) included, showing study selection process.
20	Yes	"Baseline demographic and clinical characteristics of participants" summarized in Table 1.
21a	No	Severity distribution of AKI (e.g., staging) in included studies not analyzed.
21b	No	Alternative diagnoses in non-AKI patients not discussed.
22	No	Time interval between uIL-18 testing and reference standard not specified.
23	Yes	"TP, TN, FP, FN results were calculated" (cross-tabulation implied from pooled estimates).
24	Yes	"Sensitivity: 0.64 (95% CI: 0.54–0.73)... specificity: 0.77 (95% CI: 0.71–0.83)" (precision estimates provided).
25	No	Adverse events from uIL-18 testing not mentioned.
26	Yes	"Study limitations... heterogeneity, publication bias, variability in AKI definitions" discussed.
27	Yes	"uIL-18 could be a relatively good biomarker... further research needed" (implications for practice).
28	No	No registration number or registry name provided.
29	No	Full study protocol accessibility not mentioned.
30	Yes	"Sources of funding... National Clinical Research Center for Geriatrics" declared.

Qiu 2021

Item No.	Assessment	Support for Assessment
1	Yes	The study evaluates diagnostic accuracy using AUROC (e.g., "AUROC 0.787, 95% CI 0.688 to 0.866").
2	Yes	Structured abstract includes design, methods, results, and conclusions (Abstract section).
3	Yes	Background discusses sepsis-induced AKI and the clinical role of hepcidin/NGAL (Introduction).
4	Yes	Objective stated: "assess the early predictive values of hepcidin, NGAL, and their combination" (Abstract).
5	Yes	"Prospective observational study" (Methods). Data collection planned before testing.
6	Yes	Inclusion/exclusion criteria detailed (e.g., sepsis-3.0, CKD exclusion) (Methods).
7	Yes	Patients identified based on sepsis-3.0 criteria at ICU admission (Methods).
8	Yes	"ICU of Shanghai University... from March 2017 until August 2018" (Methods).
9	Yes	"All consecutive patients admitted" (Methods).
10a	Yes	Index tests (hepcidin, NGAL) described with ELISA methods (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI (Methods).
11	No	No explicit rationale for choosing KDIGO over alternatives (assumed as best standard).

12a	No	Cut-offs for hepcidin/NGAL not pre-specified; derived from ROC analysis (Results).
12b	Yes	KDIGO criteria for AKI positivity pre-defined (Methods).
13a	Yes	"Single laboratory masked to patient clinical data" (Methods).
13b	No	Unclear if KDIGO assessors were blinded to biomarker results (not stated).
14	Yes	AUROC, sensitivity, specificity, and Delong's test used (Results/Statistics).
15	No	No mention of handling indeterminate test/reference standard results.
16	No	Missing data handling (e.g., 5 excluded due to missing samples) not explicitly discussed.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	Sample size justification/power calculation not provided.
19	Yes	Flowchart included (Fig. 1).
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	Severity distribution (e.g., AKI stages) not fully detailed beyond KDIGO counts.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Biomarkers measured at admission; AKI assessed over 7 days (Methods).
23	No	No cross-tabulation (2x2 table) of index vs. reference standard results.
24	Yes	AUROC with 95% CI reported (e.g., "AUROC 0.828, 95% CI 0.733–0.899").
25	No	Adverse events from biomarker testing not mentioned.
26	Yes	Limitations include small sample size and need for validation (Conclusion).
27	Yes	Implications for practice discussed (e.g., "good predictive value in sepsis").
28	No	No registration number or registry name provided.
29	No	Protocol accessibility not stated.
30	No	Funding sources/role of funders not declared (acknowledgments absent).

Okuda 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity, specificity, and negative predictive value of the urinary L-FABP POC kit at 2 h after entry were 55.6%, 91.9%, and 89.5%, respectively." (Abstract)
2	Yes	Structured abstract includes Purpose, Methods, Results, and Conclusions.
3	Yes	Introduction explains AKI's clinical relevance, limitations of SCr, and rationale for urinary L-FABP as a biomarker.
4	Yes	"The aim of this study was to explore... and to assess..." (Abstract) and hypotheses stated in Introduction.

5	Yes	"prospective observational study" (Methods).
6	Yes	Inclusion/exclusion criteria: age 43–99, emergency laparotomy, exclusion of chronic renal disease, etc. (Methods).
7	Yes	"Patients... undergoing emergency laparotomy for acute abdomen by diseases of the digestive system" (Methods).
8	Yes	"single-center... from November 2018 to December 2020" (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Detailed methods for quantitative/qualitative L-FABP analysis (e.g., RENAPRO kit, cut-offs).
10b	Yes	Reference standard: KDIGO criteria using SCr and urine output (Introduction/Methods).
11	Yes	Rationale for KDIGO explained in Introduction as the accepted clinical standard.
12a	No	Cut-offs determined post hoc via ROC analysis ("optimal cut-off value was determined by maximizing sensitivity/specificity"); no pre-specified thresholds.
12b	Yes	KDIGO criteria (pre-specified) used for reference standard.
13a	No	No information on whether index test assessors had access to reference results.
13b	No	No information on whether reference standard assessors had access to index test results.
14	Yes	"ROC curves... AUCs... sensitivity, specificity, NPV" (Methods/Results).
15	No	No mention of handling indeterminate test results.
16	No	No mention of missing data handling.
17	Yes	"Inter- and intra-group comparisons of AUCs were performed using the Delong test" (Methods).
18	Yes	Sample size calculation based on effect size and dropout rate (Methods).
19	No	No participant flow diagram.
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity in AKI group.
21b	No	No distribution of alternative diagnoses in non-AKI group.
22	No	No explicit description of time intervals between index test and reference standard.
23	No	No cross-tabulation of index vs. reference standard results (only accuracy metrics reported).
24	No	AUCs reported but no confidence intervals for accuracy estimates.
25	No	No mention of adverse events.
26	Yes	"Study limitations... sample size... generalisability" (Conclusion).
27	Yes	"Implications for practice... utility for excluding AKI risk" (Abstract/Conclusion).
28	Yes	"Registered in UMIN Clinical Data Registry (ID R000042937)" (Methods).
29	No	No statement on protocol accessibility.
30	No	No funding sources or roles declared in the provided text.

Lei 2018

Item No.	Assessment	Support for Assessment
1	Yes	"Urinary KIM-1, urinary NGAL, serum Cys C, and the combined detection factor, as screening indices, could aid in the early diagnosis..." (mentions diagnostic accuracy).
2	Yes	Structured abstract includes background, methods, results, and conclusions.
3	Yes	"Early monitoring and diagnosis of patients with AKI secondary to decompensated cirrhosis is difficult... search for specific, sensitive early diagnostic markers is essential" (clinical role and intended use described).
4	Yes	"We also evaluated the diagnostic efficacy of combined detection using these three indices..." (states objectives).
5	No	No explicit mention of prospective or retrospective data collection.
6	Yes	"150 patients divided into AKI and non-AKI, and healthy individuals" (eligibility criteria implied).
7	No	No description of how participants were identified (e.g., symptoms, previous tests).
8	No	No details on setting, location, or dates of participant identification.
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	"Urinary KIM-1, NGAL, serum Cys C... measured and compared" (index test details provided).
10b	No	Reference standard (KDIGO staging) mentioned but not described in replicable detail.
11	No	No rationale for choosing KDIGO as the reference standard.
12a	No	Cut-offs for index tests (e.g., KIM-1/NGA/Cys C positivity) not defined.
12b	No	No definition of reference standard cut-offs.
13a	No	No information on whether clinical data were available to index test assessors.
13b	No	No information on whether index test results were available to reference standard assessors.
14	Yes	"ROC curve analysis" and statistical comparisons (e.g., Pearson correlation) used for accuracy measures.
15	No	No description of handling indeterminate results.
16	No	No mention of missing data handling.
17	No	No variability analyses (e.g., subgroup analyses) reported.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	"Baseline patient characteristics" table with demographics and clinical data.
21a	No	No distribution of disease severity in AKI patients (e.g., by etiology).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No time interval or interventions between index test and reference standard.

23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"ROC curve analysis" with AUC values and statistical significance reported.
25	No	No mention of adverse events from tests.
26	Yes	"Study limitations... small sample size" discussed in the conclusion.
27	Yes	"Could aid in the early diagnosis of AKI secondary to decompensated cirrhosis" (implications for practice).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	No	Funding sources and roles not explicitly stated.

De geus 2011 Here is the extracted table with the requested columns:

Item No.	Assessment	Support for Assessment
1	Yes	"The areas under the receiver operating characteristic curves (AUC)... sensitivity at fixed specificities" (explicitly reports diagnostic accuracy metrics).
2	Yes	Abstract includes structured sections: Rationale, Objectives, Methods, Results, Conclusions.
3	Yes	Background on AKI burden and NGAL's role as a biomarker is provided in the introduction.
4	Yes	Objectives stated: "To assess the ability of plasma and urine NGAL to predict severe AKI."
5	Yes	"Prospective-cohort study" (data collection planned before testing).
6	Yes	Inclusion/exclusion criteria described under "Patients."
7	Yes	"All consecutive admitted patients between September 2007 and April 2008 were eligible."
8	Yes	"ICU admission" at Erasmus University Medical Center with dates specified.
9	Yes	"632 consecutive patients" included.
10a	Yes	NGAL measurement details: "Triage immunoassay" with timing/sample handling described.
10b	Yes	Reference standard: RIFLE classification based on SCr/eGFR changes.
11	No	No rationale provided for choosing RIFLE over other AKI criteria (e.g., KDIGO).
12a	Yes	NGAL cut-offs analyzed via ROC curves (Table 2).
12b	Yes	RIFLE thresholds predefined as 1.5x/2x/3x SCr increases.
13a	Unclear	Not explicitly stated whether reference standard results were blinded to NGAL testers.
13b	Unclear	Not explicitly stated whether NGAL results were blinded to RIFLE assessors.
14	Yes	"Receiver operating characteristic (ROC) curves... logistic regression."
15	No	No mention of handling indeterminate NGAL/RIFLE results.

16	Yes	"Missing admission samples were replaced by first collection values at 4/8 hours."
17	No	No variability analyses (e.g., inter-reader variability) reported.
18	No	No sample size calculation or power analysis described.
19	No	No participant flow diagram provided.
20	Yes	Table 1 reports baseline demographics/clinical characteristics.
21a	Yes	Disease severity stratified by RIFLE class (Table 1/Figure 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time interval: NGAL measured at admission; AKI assessed within 7 days.
23	Yes	Cross-tabulation implicit in ROC/AUC analysis (Figure 2).
24	Yes	AUCs with 95% confidence intervals reported (e.g., 0.77 ± 0.05).
25	No	No adverse events from NGAL/RIFLE testing mentioned.
26	Yes	Limitations: "study limitations" section discusses generalizability.
27	Yes	Implications: "NGAL adds significant accuracy... in combination with eGFR."
28	No	No registration number/registry name provided.
29	No	No protocol accessibility statement.
30	Yes	"Supported by Biosite Inc... role of funders" declared.

Hollinger 2018

Item No.	Assessment	Support for Assessment
1	Yes	"adjusted odds ratio = 3.3 [95% CI = 1.8–6.0], 3.9 [95% CI = 2.1–7.2], and 3.4 [95% CI = 1.9–6.2], all P < 0.0001"; "AUC values" reported.
2	Yes	Abstract includes structured sections: Introduction, Methods, Results, Conclusions.
3	Yes	Background discusses AKI challenges, current biomarkers, and Penkid's role as a glomerular function marker.
4	Yes	"investigated whether penkid levels are associated with MAKEs, AKI, and WRF."
5	Yes	"prospective, observational, multinational study."
6	Yes	Inclusion/exclusion criteria specified (age ≥18, sepsis/septic shock, exclusion of pregnancy, etc.).
7	Yes	Participants identified based on ICU admission for sepsis/septic shock ("symptoms, results from previous tests").
8	Yes	"24 centers from 5 countries"; recruitment period: June 2015 to May 2016.
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Penkid measurement details: blood drawn within 24h, assay method, equipment (chemiluminescence immunoassay).
10b	Yes	Reference standard defined as KDIGO criteria for AKI and MAKEs (serum creatinine, RRT, death).
11	Yes	KDIGO and MAKEs are established standards; rationale implied by clinical relevance.

12a	No	No predefined cut-offs for Penkid; analysis used continuous values/ROC curves (exploratory).
12b	Yes	KDIGO criteria include predefined SCreat thresholds (e.g., 1.5x baseline).
13a	No	"blinded penkid analysis"—clinical/reference data likely unavailable to test performers.
13b	No	No statement on whether Penkid results were available to reference assessors.
14	Yes	"logistic regression," "AUC," "95% confidence intervals."
15	No	No mention of handling indeterminate index/reference test results.
16	No	No discussion of missing data handling.
17	No	Subgroup analyses (e.g., eGFR >75) but no pre-specified variability in accuracy measures.
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram in the provided text.
20	Yes	"demographics (age, gender), SOFA/APACHE II scores, comorbidities" reported.
21a	No	No distribution of disease severity (e.g., AKI stages) in those with AKI.
21b	No	No description of alternative diagnoses in patients without AKI.
22	No	No discussion of clinical interventions between Penkid measurement and reference standard.
23	No	No 2x2 table or cross-tabulation of Penkid results vs. reference standard.
24	Yes	"adjusted odds ratio [...] 95% CI"; "AUC values" with statistical precision.
25	No	No mention of adverse events from Penkid or reference tests.
26	No	No explicit limitations section in the provided text.
27	Yes	Conclusion states Penkid's timely association with outcomes, implying clinical utility.
28	Yes	NCT02393781 (AdrenOSS) and NCT01367093 (FROG-ICU) listed.
29	No	No link or statement on full protocol accessibility.
30	Yes	"Sphingotec GmbH [...] role of funders" described in methods.

Nath 2022

Item No.	Assessment	Support for Assessment
1	Yes	"We tested the sensitivity and specificity of plasma neutrophil gelatinase-associated lipocalin (NGAL) [...] versus serum creatinine, the gold standard laboratory test." (Abstract) Explicitly states diagnostic accuracy measures.
2	Yes	Abstract includes structured sections: Introduction, Materials and Methods, Results, Conclusions.
3	Yes	Introduction describes AKI's clinical context and NGAL's role as an early biomarker compared to creatinine.
4	Yes	Objectives listed: "To compare sensitivity and specificity [...] To estimate the cut-off of plasma NGAL."

5	Yes	"A cross-sectional diagnostic type study was conducted from February 2015 to January 2017." (Methods) Implies prospective data collection.
6	Yes	Inclusion/exclusion criteria explicitly stated in "Materials and Methods."
7	Yes	Participants identified based on "septicemia, heart failure, ketoacidosis, nephrotoxic drugs, trauma, or post-operative cases."
8	Yes	"ICU of a tertiary care hospital of northeast India [...] February 2015 to January 2017."
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	Plasma NGAL measured via "particle enhanced turbidimetric immunoassay" with analyzer details.
10b	Yes	Serum creatinine measured using "Jaffe kinetic initial rate assay" with equipment and calibration details.
11	Yes	"Serum creatinine [...] the gold standard laboratory test to diagnose AKI." (Introduction)
12a	Yes	"Plasma NGAL cut-off value of 391 ng/mL" determined via ROC analysis.
12b	Yes	KDIGO criteria for AKI (creatinine rise ≥0.3 mg/dL or 1.5× baseline) used as reference standard.
13a	No	No information on blinding of index test performers to reference results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"AUC [...] sensitivity and specificity" calculated using ROC curves and Spearman correlation.
15	No	No mention of handling indeterminate/missing test results.
16	No	No description of missing data management.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram.
20	No	No demographic/clinical characteristics table (e.g., age, sex, comorbidities).
21a	No	No distribution of disease severity in AKI patients.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Tests performed "within 24 h of admissions."
23	No	No 2x2 contingency table comparing index and reference standard results.
24	Yes	"AUC of 0.800 (95% CI: 0.712–0.882)" reported.
25	No	No adverse events reported.
26	Yes	Limitations discussed: single-center design, lack of longitudinal follow-up.
27	Yes	Conclusion states NGAL's utility for early AKI detection and clinical intervention.
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	No	Funding sources not declared; only conflicts of interest stated.

Onk 2016

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve was higher in the 12-hour NGAL test (p < 0.0086)" (Abstract). AUC reported as a measure of accuracy.
2	Yes	Structured abstract includes "Introduction," "Materials and Methods," "Results," and "Conclusion" sections.
3	Yes	Introduction describes AKI's clinical significance and NGAL's role in early detection.
4	Yes	"The aim...was to detect the factors leading to AKI...and to determine the optimal timing for detecting AKI using NGAL" (Abstract).
5	Yes	"The records of 375 patients...were reviewed in this case-control study" (Methods). Retrospective design.
6	Yes	Exclusion criteria listed: congenital heart disease, tumors, inflammatory diseases, etc. (Methods).
7	Yes	Patients identified based on RIFLE criteria for AKI and post-CABS records (Methods).
8	Yes	"Mengücek Education and Research Hospital between January 2013 and June 2015" (Methods).
9	Yes	"45 patients were chosen randomly from the reviewed patients" (Methods).
10a	Yes	NGAL measured at specific postoperative intervals (6, 12, 24, 36, 48 h) with Triage NGAL Test kit (Methods).
10b	Yes	Reference standard: RIFLE criteria and SCr levels (Methods).
11	No	No explicit rationale for choosing RIFLE/SCr over alternatives.
12a	No	Cut-offs (310 and 283 ng/ml) determined post hoc via ROC analysis; no pre-specified thresholds mentioned.
12b	No	RIFLE/SCr cut-offs defined but rationale for their use vs. other standards not discussed.
13a	Unclear	Not reported whether reference standard results were available to NGAL test assessors.
13b	Unclear	Not reported whether NGAL results were available to reference standard assessors.
14	Yes	ROC analysis used to compare diagnostic accuracy of NGAL at different timepoints (Methods/Results).
15	No	No mention of handling indeterminate/missing NGAL or SCr results.
16	No	No description of missing data management.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	Sample size justified by power analysis but no explicit intended sample size stated.
19	No	No participant flow diagram provided.
20	Yes	Table 1 includes demographics, comorbidities, and clinical characteristics.
21a	No	Severity distribution of AKI (Risk/Injury/Failure) not detailed beyond counts.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals between NGAL tests and reference standard (SCr) explicitly defined.
23	Yes	NGAL results cross-tabulated with SCr-based RIFLE criteria (implied in ROC analysis).
24	No	AUC reported but no confidence intervals for sensitivity/specificity estimates.
25	No	Adverse events from NGAL or SCr testing not mentioned.
26	Yes	Limitations include retrospective design and single-center setting (Conclusion).
27	Yes	"Early postoperative NGAL results were highly specific for early recognition of AKI" (Conclusion).

28	No	No registration number or registry name provided.
29	No	Full study protocol accessibility not mentioned.
30	Yes	Funding sources and conflicts of interest declared (end of manuscript).

Zeng 2014

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the receiver operating characteristic (ROC) curve (AUC)... The largest AUC of single and combined biomarkers for predicting non-recovery after AKI only reached 0.70." (Reports AUC as a measure of accuracy.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction discusses clinical role of NGAL/L-FABP for AKI diagnosis and monitoring.
4	Yes	"The current study evaluated the power of two biomarkers... to detect AKI and predict renal recovery." (Explicit objectives in Abstract.)
5	Yes	"In this prospective study, 199 patients... were enrolled." (Prospective design stated in Methods.)
6	Yes	"Eligibility criteria included... exclusion criteria..." (Detailed in Methods.)
7	Yes	"High risk for AKI was defined by... emergency surgery, cardiac surgeries..." (Basis for eligibility in Methods.)
8	Yes	"Patients admitted to Shaanxi Province Corps Hospital... between November 2011 and March 2013." (Setting and dates provided.)
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	"Urinary NGAL was measured... by ELISA... detection limits, CVs, and correction by creatinine described." (Replicable index test details.)
10b	Yes	"AKI diagnosed by serum creatinine (AKIN criteria)... RIFLE criteria for recovery." (Reference standard details in Methods.)
11	Yes	"Serum creatinine-based assessment... has limitations... hence the need for biomarkers." (Rationale for reference standard in Introduction.)
12a	No	Cut-offs determined post-hoc via Youden index; no pre-specified thresholds mentioned.
12b	No	AKIN/RIFLE criteria used, but no rationale for their cut-offs or pre-specification.
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"AUC-ROC analysis... differences tested using non-parametric methods." (Statistical methods described.)
15	No	No mention of handling indeterminate test results.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram.
20	Yes	Table 1 summarizes demographics and clinical characteristics.

21a	Yes	"37 patients... diagnosed with AKI... stages 1, 2, 3" (Severity distribution in Results).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	"Samples collected preoperatively, 0, 4, 12 h... Reference standard applied within 2 days." (Timing specified.)
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC 0.83 [95% CI 0.74–0.91]... 0.85 (95% CI 0.77–0.93)." (Precision estimates provided.)
25	No	No adverse events reported.
26	Yes	Limitations include single-center design, small sample, and lack of generalizability (Discussion).
27	Yes	"NGAL and L-FABP can be used to detect AKI... poor predictors for recovery." (Implications stated in Conclusions.)
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	"This work was supported by..." (Funding sources disclosed in the Conflict of Interest section.)

Liu 2013

Item No.	Assessment	Support for Assessment
1	Yes	"AUCs for L-FABP was 0.844 (sensitivity (ST) 0.846, specificity (SP) 0.819...)" (Abstract). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Structured abstract includes "Background/Aim," "Methods," "Results," and "Conclusions."
3	Yes	Introduction discusses AKI prognosis, lack of biomarkers, and clinical role of L-FABP/NGAL.
4	Yes	"Investigated the value...in predicting AKI occurrence and severity" (Abstract). Clear objective.
5	Yes	"Prospectively followed 109 patients" (Abstract). Prospective data collection.
6	Yes	Inclusion/exclusion criteria: age ≥18, no ESRD, etc. (Subjects and Methods).
7	Yes	Patients identified based on undergoing cardiac surgery (Subjects and Methods).
8	Yes	"Renji Hospital...from 1 August 2009 to 31 March 2010" (Subjects and Methods).
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	ELISA kits, dilution methods, and normalization to UCr described (Sample Measurement).
10b	Yes	AKI defined by AKIN criteria (≥0.3 mg/dl or ≥150% SCr; Cases and Controls).
11	No	No rationale provided for choosing AKIN over alternative criteria (e.g., RIFLE).
12a	No	Cut-offs determined post-hoc via ROC ("closest point to sensitivity = specificity = 1").
12b	Yes	AKIN cut-offs pre-specified (≥0.3 mg/dl or ≥150% baseline SCr).
13a	No	"All measurements were made blind" (Sample Measurement). Index test blinded to reference.
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	"ROC curves and AUC...used to evaluate diagnostic accuracy" (Abstract).

15	No	No mention of handling indeterminate index/reference test results.
16	No	No discussion of missing data handling.
17	No	No variability analyses (e.g., subgroup comparisons).
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Table 1 details demographics and clinical characteristics.
21a	Yes	AKI severity distribution: 46.2% Stage I, 34.6% Stage II, 19.2% Stage III (Results).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (0/2h post-op) and reference standard (72h) not explicitly addressed.
23	No	No 2x2 contingency table showing TP, FP, TN, FN.
24	No	AUCs reported without 95% confidence intervals.
25	No	No adverse events from L-FABP/NGAL testing or SCr measurement.
26	Yes	Limitations: "small sample size, single-center study" (Conclusions).
27	Yes	"Combination enhanced accuracy...before a rise in SCr" (Conclusions).
28	No	No registration number or registry name.
29	No	No protocol accessibility statement.
30	No	No funding sources or sponsor role declared in provided text.

Munir 2013

Item No.	Assessment	Support for Assessment
1	Yes	"The aim of this study was to determine the accuracy of urinary NGAL levels... Analysis of urine NGAL at a cutoff value of 87 ng/ml showed area under the curve of 0.91... sensitivity of 90.9%... specificity of 98.7%" (Explicitly reports AUC, sensitivity, and specificity).
2	Yes	Abstract includes structured sections: Objective, Study Design, Place and Duration, Methodology, Results, Conclusion (Meets STARD for Abstracts guidance).
3	Yes	"Presently serial serum creatinine measurement is taken as gold standard... Urine NGAL is considered superior... clinical role explained in diagnosis and early prediction" (Describes clinical background and intended use of NGAL test).
4	Yes	"The aim of this study was to determine the accuracy... and to determine the appropriate cutoff" (Clear objectives and hypotheses stated).
5	Yes	"Blood samples... were drawn pre-operatively, 4 h, 24 h and 48 h after CPB... urine samples collected at 4 h" (Prospective data collection planned before index/reference tests).
6	Yes	"Inclusion: 18-80 years, CPB surgery. Exclusion: chronic kidney disease, transplant, nephrotoxic drugs" (Eligibility criteria defined).

7	Yes	"Patients undergoing CPB surgery in AFIC/NIHD were included" (Identified based on surgical procedure).
8	Yes	"AFIP in collaboration with AFIC/NIHD, Rawalpindi, from April to December 2011" (Setting, location, and dates specified).
9	Yes	"88 patients... were consecutively included" (Consecutive sampling confirmed).
10a	Yes	"Urine NGAL measured on Abbott ARCHITECT i2000SR analyzer using CMIA technology" (Index test replication details provided).
10b	Yes	"Serum creatinine measured on Beckman UniCel® DxC 600... modified rate Jaffe assay" (Reference standard replication details provided).
11	No	No rationale given for selecting serum creatinine as the reference standard (Alternatives like AKIN criteria mentioned but no justification).
12a	Yes	"Cutoff value of 87 ng/ml... determined via ROC analysis" (Pre-specified cutoff rationale via statistical method).
12b	No	No explicit definition/rationale for serum creatinine cutoffs (AKIN criteria referenced but not detailed).
13a	Unclear	Not reported whether reference standard results were available to NGAL test assessors (No information to confirm "Yes" or "No").
13b	Unclear	Not reported whether NGAL results were available to creatinine assessors (No information to confirm "Yes" or "No").
14	Yes	"AUC-ROC, sensitivity, specificity, Spearman correlation" (Methods for accuracy measures described).
15	No	No mention of handling indeterminate/missing test results (e.g., unclear if any samples were excluded).
16	No	No description of missing data handling (e.g., attrition or incomplete samples).
17	No	No variability analyses (e.g., subgroup analyses or confidence intervals beyond AUC).
18	No	No intended sample size calculation or power analysis reported.
19	No	No participant flow diagram provided (Only text describes recruitment).
20	Yes	Table I lists demographics: age, sex, weight, clinical parameters (Baseline characteristics reported).
21a	No	No distribution of disease severity in AKI group (Only mentions presence/absence).
21b	No	No distribution of alternative diagnoses in non-AKI group (Not discussed).
22	Yes	"Time interval: Samples collected at 4 h, 24 h, 48 h post-CPB" (Time between index test and reference standard addressed).
23	Yes	Table I and ROC analysis provide cross-tabulation (NGAL vs. creatinine outcomes).
24	Yes	"AUC 0.91, 95% CI 0.83–0.96; sensitivity 90.9%, specificity 98.7%" (Accuracy estimates with precision).
25	No	No adverse events reported from NGAL or creatinine tests.
26	Yes	"Limitations: Serum creatinine itself is a poor marker... difficulty in sampling oliguric patients" (Study limitations discussed).
27	Yes	"Urine NGAL is an early predictive biomarker... clinical utility includes avoiding nephrotoxic drugs" (Implications for practice stated).
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	"Department of Chemical Pathology... AFIC/NIHD" (Institutional support implied; no explicit funding source).

Vogel 2021

Item	Assessment	Support for Assessment

No.		
1	Yes	"ROC analysis was performed and AUC and sensitivity, as well as specificity for KIM-1 and NAG were calculated." (Explicitly reports diagnostic accuracy measures including AUC, sensitivity, and specificity.)
2	Yes	Abstract includes structured sections: "Aims," "Methods and results," and "Conclusion."
3	Yes	Introduction describes the clinical role of KIM-1 and NAG as biomarkers for AKI and COVID-19 severity.
4	Yes	"The aim of the current study was to evaluate whether tubular markers... are related to AKI and severe disease." (Explicitly states objectives.)
5	Yes	"In this prospective observational clinical trial..." (Data collection planned prospectively.)
6	Yes	"Pre-specified exclusion criteria consisted of age below 18 years and inability to sign consent."
7	Yes	"Adult patients presenting with acute symptoms of respiratory infection (cough and/or fever)."
8	Yes	"Emergency department of the University Hospital Regensburg... between March 2020 and February 2021."
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	Detailed methods for KIM-1/NAG measurement: ELISA kits, centrifugation, normalization to urine creatinine.
10b	No	AKI diagnosed via KDIGO criteria but lacks operational details (e.g., how creatinine changes were measured over time).
11	No	No rationale provided for choosing KDIGO as the reference standard.
12a	No	ROC analysis used but no pre-specified cut-offs; exploratory analysis implied.
12b	No	KDIGO criteria referenced but no explicit definition of positivity thresholds.
13a	No	No information on blinding of index test performers to clinical data or reference results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC analysis... AUC, sensitivity, and specificity were calculated."
15	No	No description of handling indeterminate results (e.g., missing KIM-1 values).
16	No	Excluded patients without urine samples (n=54) but did not address other missing data.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	No sample size calculation or justification provided.
19	Yes	Figure 1: STARD flow diagram included.
20	Yes	Table 1: Baseline demographics and clinical characteristics reported.
21a	No	AKI incidence reported but no distribution of severity (e.g., KDIGO stages).
21b	No	Control group had "other respiratory infections" but no specific alternative diagnoses listed.
22	No	No time interval reported between index test (KIM-1) and reference standard (AKI diagnosis).
23	No	No 2x2 contingency table comparing KIM-1 results against AKI outcomes.
24	No	AUC reported but no confidence intervals for accuracy estimates.
25	No	No adverse events mentioned from urine collection or testing.
26	Yes	Limitations discussed: small sample size, single-center design.

27	Yes	Conclusion states KIM-1's potential for early AKI detection and risk stratification.
28	No	No registration number or registry name provided.
29	No	No link or reference to a publicly available study protocol.
30	No	Funding sources and roles not explicitly declared in the provided text.

Zaitoun 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the receiver operating characteristic curve, AUROC = 0.905" (Abstract). Explicit use of AUC as a measure of diagnostic accuracy.
2	Yes	Structured abstract includes design, methods, results, and conclusions (Abstract and Methods sections).
3	Yes	Background describes clinical role of RRI and biomarkers for early AKI prediction (Background and Introduction).
4	Yes	"The aim of this study is to compare..." explicitly states objectives (Abstract and Methods).
5	Yes	"Single-center prospective cohort" (Methods). Data collection planned before index/reference tests.
6	Yes	Inclusion/exclusion criteria detailed (Methods: eligibility criteria for sepsis patients, exclusions for CKD, pregnancy, etc.).
7	Yes	Participants identified based on "sepsis syndromes" at ICU admission (Methods).
8	Yes	"Conducted... at Alexandria University from May 15, 2019, to February 28, 2021" (Methods).
9	Yes	"Consecutive patients were assessed" (Methods).
10a	Yes	RRI methodology detailed: equipment, Doppler measurements, formula (Methods).
10b	Yes	Reference standard defined as KDIGO criteria for AKI (Methods).
11	No	No rationale provided for choosing KDIGO over other AKI criteria.
12a	No	RRI cutoff ≥0.72 derived post hoc via ROC analysis; no pre-specified rationale (Results).
12b	Yes	KDIGO criteria for AKI are pre-specified and defined (Methods).
13a	Yes	"Independent blinded radiologist" performed RRI measurements, suggesting no access to reference standard results during testing (Methods).
13b	Unclear	Not explicitly stated whether assessors of KDIGO criteria had access to index test results. Assumed "No" but insufficient evidence.
14	Yes	ROC curves, sensitivity, specificity, and 95% CIs reported (Results).
15	No	No mention of handling indeterminate results (e.g., missing RRI measurements).
16	No	Excluded patients due to lack of consent, but no protocol for missing data (Methods).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup comparisons).
18	No	No sample size calculation or justification provided.
19	Yes	Participant flow diagram included (Fig. 1).
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	Severity distribution of AKI (e.g., KDIGO stages) not reported.

21b	No	Alternative diagnoses in non-AKI patients not described.
22	No	Time interval between index test (RRI) and reference standard (KDIGO) not explicitly addressed.
23	No	No 2x2 contingency table cross-tabulating index test vs. reference standard results.
24	Yes	AUROC, sensitivity, specificity, and 95% CIs reported (Table 3, Fig. 2).
25	No	No adverse events mentioned from RRI or biomarker tests.
26	Yes	Limitations discussed: single-center design, lack of long-term outcomes (Discussion).
27	Yes	Implications for practice stated: RRI and Cys C as predictors (Abstract and Conclusion).
28	Yes	"Registered on ClinicalTrials.gov (NCT03799159)" (Methods).
29	No	No mention of where the full study protocol is accessible.
30	No	Funding sources and roles not declared in the provided text.

Sakyi 2021

Item No.	Assessment	Support for Assessment
1	Yes	"The cut-off for [TIMP-2]*[IGFBP-7] showed the best predictive ability (95.8% sensitivity, 77.2% specificity, 44.2% PPV and 99% NPV)" (Results). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions. Matches STARD for Abstracts guidance.
3	Yes	"The intended use...for early diagnosis of AKI in at risk patients" (Abstract) and background on AKI diagnosis limitations (Introduction).
4	Yes	"This study...to evaluate biomarkers...to assess AKI among hospitalized patients" (Abstract). Objectives stated in Introduction.
5	Yes	"This prospective cross-sectional study" (Abstract). Data collection planned prospectively.
6	Yes	Exclusion criteria: "chronic kidney disease, ESRD, non-consenting patients" (Methods).
7	No	No explicit basis for identifying participants (e.g., symptoms or prior tests). States "conveniently enrolled" without further details.
8	Yes	"Trauma and Specialist Hospital...June 2017 to February 2018" (Methods).
9	Yes	"Convenience sampling" used (Methods).
10a	No	Mentions "ELISA kits" but lacks replication details (brands, protocols). Insufficient for replication.
10b	Yes	"AKI diagnosed and staged using KDIGO guideline" (Methods). Sufficient reference standard details.
11	No	No rationale provided for choosing KDIGO over alternative reference standards.
12a	No	Cut-offs determined post-hoc via ROC analysis ("optimal cutoffs...based on ROC"), not pre-specified.
12b	Yes	KDIGO criteria are pre-specified and widely accepted. No exploration mentioned.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.

14	Yes	"ROC curve analysis...sensitivity, specificity, PPV, NPV" (Methods). Appropriate accuracy measures.
15	No	No mention of handling indeterminate results (e.g., missing/uninterpretable data).
16	Yes	"29 participants excluded due to missing blood samples" (Methods). Addressed missing data.
17	No	No analysis of variability in accuracy (e.g., subgroup analyses or pre-specified variability assessments).
18	No	No sample size calculation or justification provided.
19	Yes	Figure 1 illustrates participant flow diagram.
20	Yes	Table 1 reports demographics and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., staging details beyond presence/absence).
21b	No	No distribution of alternative diagnoses in non-AKI participants.
22	No	No explicit time interval or clinical interventions between index test and reference standard.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC = 0.94, CI = 0.90–0.98" with confidence intervals (Results).
25	No	No adverse events reported from tests.
26	Yes	Limitations: "single-center, small sample size" (Discussion).
27	Yes	"Can be used in high-risk patients for early diagnosis" (Conclusion). Clinical role addressed.
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	"Ethical approval...Kwame Nkrumah University" and funding sources (Methods).

Vaidya 2008

Item No.	Assessment	Support for Assessment
1	Yes	"The primary objective... was to evaluate the sensitivity, specificity, and prognostic ability... AUC-ROC for the combination of biomarkers" (Abstract, Introduction, Results). Explicitly uses diagnostic accuracy measures.
2	Yes	Structured abstract includes study design, methods, results, and conclusions.
3	Yes	Introduction describes AKI's clinical burden and limitations of traditional biomarkers, emphasizing the need for novel urinary biomarkers.
4	Yes	Objectives stated: "The primary objective... evaluate sensitivity, specificity, and prognostic ability... compare diagnostic performance of nine biomarkers" (Introduction).
5	No	No explicit statement on whether data collection was prospective or retrospective. Participants were recruited from existing services, suggesting possible retrospective enrollment.
6	Yes	Eligibility criteria detailed for AKI and non-AKI groups, including RIFLE criteria, stable SCr, and exclusion factors (Methods: "Selection of participants").

7	Yes	AKI participants identified via nephrology consultation and chart review; non-AKI cohorts from specific populations (Methods: "Selection of participants").
8	Partial/No	Mentions "Brigham and Women's Hospital" but lacks specific dates or duration of recruitment.
9	No	No mention of consecutive, random, or convenience sampling. Likely convenience sampling but not explicitly stated.
10a	Yes	Detailed methods for biomarker assays, including reagents, instruments, and protocols (Methods: "Measurement of urinary biomarkers").
10b	Yes	Reference standard defined as RIFLE criteria for AKI diagnosis (Methods: "Selection of participants").
11	No	Rationale for choosing RIFLE as the reference standard not explicitly provided.
12a	No	Cut-offs for biomarker positivity (33rd/67th percentiles) derived from non-AKI subjects but not pre-specified as exploratory or predefined.
12b	N/A	RIFLE criteria are clinical classifications without explicit test positivity cut-offs.
13a	Unclear	No information on whether reference standard results were available to index test assessors.
13b	Unclear	No information on whether index test results were available to reference standard assessors.
14	Yes	ROC curves, AUC, and bootstrap confidence intervals used to compare accuracy (Methods: "Statistics").
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No discussion of missing data handling.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No stated sample size calculation or justification.
19	No	No participant flow diagram provided.
20	Yes	Baseline demographics and clinical characteristics summarized (e.g., AKI vs. non-AKI groups).
21a	No	No distribution of disease severity in AKI patients (e.g., RIFLE stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Urine samples collected near AKI diagnosis; timing relative to reference standard addressed (Methods: "Urine samples").
23	No	No 2x2 contingency table of index test vs. reference standard results.
24	Yes	AUC-ROC values and 95% confidence intervals reported (Results, Abstract).
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed, including single-center design and lack of longitudinal data (Discussion).
27	Yes	Implications for practice stated: biomarkers improve AKI diagnosis/prognosis (Abstract, Discussion).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	Funding sources and affiliations listed (Title page, footnotes).

Unknown 0000

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the receiver operating curves (ROCs) was calculated to assess the early diagnostic value..." (Abstract). The study explicitly mentions AUC as a measure of diagnostic accuracy.
2	Yes	The abstract includes structured sections: Background, Methods, Results, Conclusions, fulfilling STARD for Abstracts criteria.
3	Yes	The introduction describes the clinical role of CRS-1 diagnosis and the need for novel biomarkers like pPENK and uNT-proBNP.
4	Yes	"We evaluated the predictive value of plasma proenkephalin (pPENK) and urine NT-proBNP (uNT-proBNP)..." (Abstract). Objectives and hypotheses are stated.
5	Yes	"This is a prospective, double-center, observational study..." (Methods). Data collection was planned prospectively.
6	Yes	Inclusion/exclusion criteria are detailed under "Study design and population."
7	Yes	Participants were identified based on ADHF symptoms and laboratory results (pBNP >100 pg/mL).
8	Yes	"Consecutive hospitalized patients... from The First Hospital of Hebei Medical University and The Second Hospital..." (Methods). Dates: November 2020 to June 2021.
9	Yes	"Consecutive hospitalized patients with ADHF were enrolled."
10a	Yes	Index tests (pPENK, uNT-proBNP/uCr) are described with assay methods, instruments, and kits (e.g., Roche Cobas E411).
10b	Yes	Reference standard (pNGAL) is described with ELISA methods and rationale.
11	Yes	"pNGAL was chosen as the reference [as] a typical biomarker of early AKI..." (Methods).
12a	No	Cut-offs for pPENK and uNT-proBNP/uCr were determined post hoc using ROC/Youden index; no pre-specified thresholds mentioned.
12b	No	pNGAL cut-offs are not defined or justified; only used for comparison.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Logistic regression... AUROC... Cox regression" (Methods). Methods for accuracy estimation are described.
15	No	No mention of handling indeterminate results (e.g., missing or ambiguous test values).
16	No	No description of missing data handling for index or reference tests.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	Sample size calculation is detailed with assumptions, software, and adjustments for attrition.
19	Yes	Figure 1 shows participant flow from recruitment to analysis.
20	Yes	Table 1 summarizes baseline demographics and clinical characteristics.
21a	Yes	CRS-1 severity (AKI stages 1–4) is reported in Results.
21b	No	No distribution of alternative diagnoses in non-CRS-1 patients provided.
22	No	Time interval between index test (admission) and reference standard (during hospitalization) is not explicitly stated.
23	No	No 2x2 contingency table comparing index test results against the reference standard.

24	Yes	AUROC values with 95% CIs are reported for pPENK and uNT-proBNP/uCr.
25	No	No adverse events from index or reference tests mentioned.
26	Yes	Limitations include single-center design, small sample size, and lack of external validation (Discussion).
27	Yes	"Implications for practice" are discussed in the Conclusion (e.g., potential biomarkers for early diagnosis).
28	No	No registration number or registry name provided.
29	No	No statement on accessing the full study protocol.
30	Yes	Funding sources (none declared) and ethics approval are stated.

Ferrari 2019

Item No.	Assessment	Support for Assessment
1	Yes	"area under the receiver operating characteristic curve (AUC) equal to 0.70 (95%CI 0.65–0.76)" (Reports AUC as a measure of diagnostic accuracy).
2	Yes	Structured abstract includes study design, methods, results, and conclusions (Abstract outlines purpose, methods, results, and conclusions).
3	Yes	Background discusses AKI diagnosis limitations and the role of [TIMP-2]·[IGFBP7] as a biomarker for early AKI prediction (Introduction section).
4	Yes	Objective stated: "to evaluate if the predictive value of [TIMP-2]·[IGFBP7] for AKI might continue after 12 hours" (Abstract and Methods).
5	Yes	"prospective cohort study" (Title and Methods confirm prospective data collection).
6	No	Eligibility criteria mentioned as "critically ill adult patients" but lacks detailed inclusion/exclusion criteria (Methods section).
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior tests).
8	Yes	"enrolled 442 critically ill adult patients from June to December 2016" (Specifies setting, location, and dates).
9	No	No mention of consecutive, random, or convenience sampling (Methods do not describe enrollment method).
10a	Yes	"[TIMP-2]·[IGFBP7] measured using NephroCheck® Test with urine samples collected at ICU admission" (Sufficient detail for replication).
10b	Yes	Reference standard: KDIGO criteria for AKI based on serum creatinine and urine output (Methods define AKI staging).
11	Yes	Rationale for KDIGO: "current definition of AKI" and its clinical relevance (Introduction and Methods).
12a	Yes	Cut-off of 0.3 $(ng/ml)^2/1000$ predefined based on prior validation (Sapphire Study cited in Introduction).
12b	Yes	KDIGO stages 1-3 criteria predefined (Methods reference KDIGO guidelines).
13a	No	No information on blinding of index test performers to clinical data or reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve...AUC...logistic regression model" (Methods describe statistical analysis for accuracy measures).
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data handling for index test or reference standard.
17	Yes	Variability analyzed via AUC comparisons across different timeframes (12h, 48h, 7d) (Results section).

18	No	No sample size calculation or justification provided (Methods lack power analysis).
19	Yes	"Flow of participants, using a diagram" (Supplementary Fig. 1S referenced).
20	Yes	Table 2 provides baseline demographics and clinical characteristics.
21a	Yes	AKI severity distribution (stage 1-3) reported in Results and Supplementary Table 1S.
21b	Yes	Table 1 lists admission diagnoses for the cohort, including non-AKI patients.
22	Yes	Time interval: Biomarker measured at ICU admission, AKI assessed up to 7 days (Methods specify follow-up).
23	No	No 2x2 contingency table provided for index test vs. reference standard results (only percentages reported).
24	Yes	"AUC 0.70 (95%CI 0.65–0.76)" (Precision estimates with confidence intervals).
25	No	No adverse events reported from biomarker testing or reference standard.
26	Yes	Limitations discussed: single-center design, observational nature (Discussion section).
27	Yes	Implications for clinical use of biomarkers in AKI prediction (Conclusion section).
28	No	No registration number or registry name provided.
29	No	No link or reference to a publicly accessible study protocol.
30	No	Funding sources and roles not explicitly stated in the provided text.

Matsui 2011

Item No.	Assessment	Support for Assessment
1	Yes	"The areas under the ROC (AUCs) of clinical parameters... AUC for urinary L-FABP (0.95)" (Results). Explicitly reports AUC, sensitivity (0.86), and specificity (1.00).
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction describes AKI's clinical relevance and roles of L-FABP (tubular injury) and PCX (podocyte injury) as biomarkers.
4	Yes	"Our aims were to evaluate... and to examine..." (Abstract). Clear objectives and hypotheses.
5	No	No explicit statement on prospective/retrospective data collection. Patients were enrolled during ICU admission, but planning timing is unclear.
6	Yes	"Inclusion criteria... no anuria, no hemodialysis, urine samples obtained..." (Methods). Eligibility criteria defined.
7	Yes	Participants identified based on ICU admission for critical illnesses (e.g., sepsis, shock).
8	Yes	"ICU at... St. Marianna University... between April 2009 and August 2009" (Methods).
9	No	No mention of consecutive, random, or convenience sampling; likely convenience sampling but not explicitly stated.
10a	Yes	"Urinary L-FABP was measured by ELISA using HUMAN L-FABP ELISA kit" (Methods). Sufficient detail for replication.
10b	Yes	AKI defined by serum creatinine changes: "increase ≥26.4 μmol/L or ≥50% from baseline" (Methods). Reference standard clearly defined.
11	No	No rationale provided for selecting serum creatinine as the reference standard.

12a	Yes	"Cut-off value 44.1 µg/g Cr" (Results). Pre-specified via ROC analysis, though exploratory intent is unclear.
12b	No	No cut-offs or rationale for reference standard (serum creatinine) categories.
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curves... sensitivity, specificity, positive/negative predictive values" (Methods). Methods for accuracy estimation described.
15	No	No mention of handling indeterminate test results.
16	No	No description of missing data handling.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroups).
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram provided.
20	Yes	Table 1 lists demographic/clinical characteristics (age, gender, comorbidities).
21a	No	No distribution of disease severity in AKI group (e.g., staging).
21b	No	No distribution of alternative diagnoses in non-AKI group.
22	Yes	"Urine samples obtained every 8 h... serum creatinine assessed daily" (Methods). Time intervals specified.
23	No	No 2x2 table cross-tabulating index test vs. reference standard results.
24	No	AUC reported but no confidence intervals for accuracy estimates.
25	No	No adverse events reported from tests.
26	Yes	"Study limitations... small sample size" (Discussion).
27	Yes	"L-FABP is a useful biomarker for early detection of AKI" (Conclusions). Implications for practice stated.
28	No	No registration number or registry name.
29	No	No mention of study protocol availability.
30	No	Funding sources not disclosed; only ethics approval mentioned.

Sharrod-cole 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The objective of this study was to assess the diagnostic value of plasma neutrophil gelatinase-associated lipocalin (pNGAL) for the early diagnosis of acute kidney injury (AKI)... Summary values for sensitivity and specificity were estimated..." (Explicitly states diagnostic accuracy measures).
2	Yes	Structured abstract includes objectives, methods ("systematic review and meta-analysis"), results ("superior performance... at 4–8h"), and conclusions ("diagnostic utility... is inconclusive").
3	Yes	Background discusses AKI clinical relevance, limitations of creatinine, and NGAL's role as an early biomarker under "Scientific and clinical

		background."
4	Yes	"The objective of this study was to assess the diagnostic value..." and hypotheses implied in timing subgroup analyses.
5	Yes	Retrospective design: "Electronic databases and other resources were systematically searched for relevant studies."
6	Yes	Inclusion/exclusion criteria specified: adult CPB patients, pNGAL within 24h, AKI defined by KDIGO/RIFLE/AKIN, etc.
7	Yes	"Eligibility criteria" section defines participants based on surgery type (CPB), biomarker timing, and AKI definitions.
8	Yes	"Where and when" partially addressed: studies included are from global sources (e.g., country data in Table 1), but no specific dates.
9	No	No mention of consecutive/random/convenience sampling in included studies.
10a	Partial/Yes	pNGAL methods described as "measurement of pNGAL for early diagnosis," but assay heterogeneity noted ("lack of standardization of assays").
10b	Yes	Reference standard: AKI defined by KDIGO/RIFLE/AKIN criteria ("AKI clearly defined by acceptable methods").
11	Yes	Rationale for AKI criteria: "diagnosis of AKI largely relies on serum creatinine... suboptimal markers" justifies reference standard choice.
12a	No	pNGAL cut-offs varied across studies; no pre-specified thresholds reported.
12b	Yes	AKI criteria (e.g., KDIGO) are pre-specified and defined.
13a	Unclear/No	No information on whether clinical data were blinded to pNGAL assessors.
13b	Unclear/No	No information on whether pNGAL results were blinded to AKI assessors.
14	Yes	"Hierarchical summary ROC curve model" and "random-effects meta-analysis" described.
15	No	No discussion of handling indeterminate/missing test results.
16	No	Missing data handling not addressed.
17	No	No analysis of variability in accuracy measures (heterogeneity noted but not quantified per STARD).
18	No	No intended sample size calculation; meta-analysis sample size (3131 patients) is post hoc.
19	Yes	PRISMA flowchart (Fig. 1) shows participant flow.
20	Yes	"Baseline demographic and clinical characteristics" summarized in Table 1.
21a	No	Severity distribution of AKI (e.g., stages) not reported.
21b	No	Alternative diagnoses in non-AKI patients not discussed.
22	Yes	Timing of pNGAL relative to CPB cessation analyzed (subgroups: <4h, 4–8h, etc.).
23	Yes	"Cross tabulation... TP, FP, FN, TN" extracted for meta-analysis.
24	Yes	"Sensitivity, specificity, AUC, and 95% confidence intervals" reported.
25	No	Adverse events from pNGAL testing not mentioned.
26	Yes	Limitations: "heterogeneity, lack of assay standardization, inability to detect NGAL forms."
27	Yes	Conclusions state "diagnostic utility... is inconclusive" and call for future studies.
28	Yes	"PROSPERO; registration number CRD42021261676."
29	No	No link to full study protocol.
30	Yes	Funding: "The authors declare no competing interests." (Explicitly stated under "Competing interests").

Ralib 2017

Item No.	Assessment	Support for Assessment
1	Yes	"The diagnostic area under curve for AKI was 0.81 (95%CI: 0.74 to 0.87)." (Abstract) Explicitly reports AUC, sensitivity, and specificity.
2	Yes	Abstract includes structured sections: Aim, Methods, Results, Conclusions.
3	Yes	"Plasma NGAL is a promising biomarker... evaluated plasma NGAL's diagnostic performance..." (Abstract); Background in Introduction discusses AKI, sepsis, and NGAL's role.
4	Yes	"We aimed to evaluate... detect AKI... determine if a different diagnostic threshold was appropriate..." (Introduction).
5	Yes	"This was a single centre, prospective observational study..." (Methods).
6	Yes	Inclusion/exclusion criteria listed: age >18, SIRS, exclusion for antibiotic use >24h, consent (Methods).
7	Yes	Participants identified based on SIRS criteria and infection status (Methods).
8	Yes	"ICU of Tengku Ampuan Afzan Hospital, Kuantan, Malaysia... recruited between February 2013 and August 2015" (Methods).
9	Yes	"Consecutive recruitment... not possible... convenience sample" (Methods).
10a	Yes	"Plasma NGAL was analysed using the Triage® NGAL test" (Methods).
10b	Yes	AKI defined using KDIGO criteria (pCr or urine output) (Methods).
11	No	No explicit rationale provided for choosing KDIGO as the reference standard.
12a	No	Optimal cut-offs (e.g., 454 vs. 176 ng/ml) were derived post hoc; no pre-specified thresholds mentioned.
12b	Yes	KDIGO criteria for AKI (pre-specified reference standard).
13a	No	Unclear if NGAL testers were blinded to reference standard results.
13b	No	Unclear if reference standard assessors were blinded to NGAL results.
14	Yes	"AUC of ROC curve... sensitivity, specificity, IDI" (Methods).
15	No	No mention of handling indeterminate results for NGAL or AKI diagnosis.
16	No	No details on missing data handling for NGAL or reference standard.
17	Yes	"Optimal cut-off was higher in sepsis... subgroup analyses" (Results).
18	No	No sample size calculation or justification provided.
19	Yes	"Figure 1" illustrates participant flow (Results).
20	Yes	Table 1 describes demographics, SAPS II, SOFA scores (Results).
21a	No	No distribution of disease severity in AKI patients (e.g., AKI stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	NGAL and pCr measured within 24h of ICU admission (Methods).
23	No	No cross-tabulation of NGAL results vs. reference standard (only AUC reported).

24	Yes	"AUC 0.81 (0.74–0.87)... 95% CIs" (Results).
25	No	No adverse events reported from NGAL or reference tests.
26	Yes	"Study limitations... convenience sample, single centre" (Discussion).
27	Yes	"Implications for practice... improved clinical model" (Abstract/Discussion).
28	Yes	"Registered under NMR-11-1102-9248" (Methods).
29	No	No mention of protocol accessibility.
30	Yes	Funding sources: None declared; ethics approval noted (Methods).

Nisula 2014

Item No.	Assessment	Support for Assessment
1	Yes	"We calculated the areas under receiver operating characteristics curves (AUC) with 95% confidence intervals (95% CIs)... sensitivity, specificity, and positive likelihood ratios (LR+)" (Results section). Explicitly reports diagnostic accuracy measures.
2	Yes	Structured abstract includes "BACKGROUND," "METHODS," "RESULTS," and "CONCLUSION" sections (Abstract).
3	Yes	"Urine neutrophil gelatinase-associated lipocalin (uNGAL) is increasingly used as a biomarker for acute kidney injury (AKI)" (Background). Describes clinical role of uNGAL.
4	Yes	"We tested the primary hypothesis that uNGAL levels are associated with RRT... assessed the association of NGAL with AKI and 90-day mortality" (Introduction). States objectives and hypotheses.
5	Yes	"We prospectively obtained urine samples from 1042 adult patients" (Methods). Prospective data collection declared.
6	Yes	Inclusion/exclusion criteria detailed under "Patients" section (e.g., age ≥18, exclusion of chronic dialysis patients).
7	Yes	"Emergency ICU admissions" and "elective admissions with ICU stay >24 hours" (Methods). Basis for eligibility explained.
8	Yes	"15 Finnish intensive care units... September 1 to December 1, 2011" (Methods). Specifies setting, location, and dates.
9	No	No explicit statement on whether participants were consecutive, random, or convenience series. Describes "random sample of patients" but unclear if consecutive.
10a	Yes	"NGAL ELISA Rapid Kits (BioPorto®)... urine samples at ICU admission, at 12 and 24 hours... stored at −80°C" (Methods). Sufficient detail for replication.
10b	Yes	"AKI defined by KDIGO criteria... baseline serum creatinine" (Methods). Reference standard clearly defined.
11	Yes	KDIGO criteria chosen as "best available method" for AKI diagnosis (Methods and Definitions). Rationale implied.
12a	Yes	"Best cutoff points with Youden index... uNGAL24" (Methods). Pre-specified positivity cutoffs explained.
12b	Yes	KDIGO stages (based on creatinine/urine output) predefined (Definitions). Reference standard categories defined.
13a	No	No information on whether reference standard results were available to index test assessors. Unclear blinding protocol.

13b	No	No information on whether index test results were available to reference standard assessors.
14	Yes	"AUC, sensitivity, specificity, LR+, NRI, IDI" (Methods). Statistical methods for accuracy measures described.
15	Yes	"Out-of-range values registered as highest/lowest value (10 or 1000 ng/mL)" (Methods). Handling of indeterminate results specified.
16	Yes	"Excluded patients with missing baseline serum creatinine" (Methods). Missing data handling described.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses for pre-specified vs. exploratory).
18	No	No mention of intended sample size calculation or power analysis.
19	No	No participant flow diagram provided (only text description under "Patients").
20	Yes	"Baseline demographic and clinical characteristics" reported in Table 1 and text (Results).
21a	Yes	AKI severity (KDIGO stages) reported in Results and Supplemental Content.
21b	Yes	"Distribution of alternative diagnoses" implied by excluding sepsis/AKI subgroups in sensitivity analyses.
22	Yes	Time interval between index test (uNGAL24) and reference standard (daily creatinine/urine output) defined.
23	Yes	Cross-tabulation of uNGAL24 vs. outcomes (AKI/RRT/mortality) in AUC and NRI analyses (Results).
24	Yes	"AUC (95% CI) for AKI: 0.733 (0.701–0.765)... precision metrics reported" (Results).
25	No	No mention of adverse events from uNGAL testing or reference standard.
26	Yes	"Study limitations... confounding factors (e.g., sepsis)" discussed (Conclusion).
27	Yes	"uNGAL associated well with RRT but not AKI/mortality... implications for clinical use" (Conclusion).
28	No	No registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	Yes	"Funding: Clinical Research funding... conflicts of interest declared" (End of text).

Maisel 2016

Item No.	Assessment	Support for Assessment
1	Yes	The study evaluates diagnostic accuracy using AUC (e.g., "areas under the curve: 0.656, 0.647, and 0.652").
2	Yes	The structured abstract includes objectives, methods, results, and conclusions under designated headings (e.g., "BACKGROUND," "METHODS," "RESULTS").
3	Yes	Background discusses the clinical role of NGAL for AKI detection in AHF: "Novel biomarkers are needed for earlier detection of WRF..."
4	Yes	Objectives are explicitly stated: "to determine whether NGAL is superior to creatinine for prediction and/or prognosis of WRF."
5	Yes	Prospective design: "multicenter, prospective cohort study...data collection planned before index test and reference standard."
6	Yes	Eligibility criteria detailed under "PARTICIPANTS" (e.g., age ≥18, AHF symptoms, IV diuretic use).
7	Yes	Participants identified based on symptoms (e.g., "dyspnea, rales") and planned IV diuretic therapy.

8	No	No explicit mention of dates or specific locations beyond "16 sites, 7 in the United States and 9 in Europe."
9	No	No description of whether participants were consecutive, random, or convenience-based.
10a	Yes	NGAL methodology: "plasma NGAL measured using Abbott ARCHITECT assay" (sufficient for replication).
10b	Yes	Reference standard (creatinine) defined: "WRF = sustained increase in creatinine ≥0.5 mg/dl or ≥50%."
11	Yes	Rationale for creatinine as reference: "creatinine is currently the standard biomarker for renal function."
12a	No	NGAL cut-offs (e.g., 150 ng/ml) were post hoc: "post hoc analysis...first NGAL <150 ng/ml" (not pre-specified).
12b	Yes	Creatinine cut-offs pre-specified: "primary outcome defined as ≥0.5 mg/dl or ≥50% increase."
13a	No	No mention of blinding between index test (NGAL) and reference standard (creatinine) results.
13b	No	No mention of blinding for reference standard assessors.
14	Yes	Methods for accuracy: "areas under the curve...sensitivity, specificity, confidence intervals."
15	No	No description of handling indeterminate NGAL or creatinine results.
16	No	No explicit methods for handling missing data.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses were post hoc).
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram included.
20	Yes	Baseline demographics: "mean age, 68.5 years; 62% men" and clinical characteristics described.
21a	No	No distribution of disease severity in subjects with AKI (e.g., staging of AKI).
21b	No	No distribution of alternative diagnoses in non-AKI subjects.
22	Yes	Timing: "creatinine measured daily" and NGAL collected at admission and serially.
23	No	No cross-tabulation (2x2 table) of NGAL vs. creatinine results provided.
24	Yes	Accuracy estimates with 95% CIs: "AUC: 0.656 (95% CI: 0.58–0.73)."
25	Yes	Adverse events reported: "235 adverse events in 144 subjects."
26	Yes	Limitations discussed: "single-center studies...NGAL's utility in AHF unclear."
27	Yes	Implications for practice: "NGAL cannot be recommended for AKI diagnosis in AHF."
28	Yes	Registration number: "NCT01291836" listed.
29	No	No statement about accessing the full study protocol.
30	Yes	Funding: "Abbott Laboratories and Alere, Inc., jointly sponsored the study...roles of funders described."

Tan 2022

Item No.	Assessment	Support for Assessment

1	Yes	"Receiver operating characteristic curve (ROC) was used to evaluate the diagnostic value... sensitivity and specificity were 98.2% and 96.7%, respectively." (Abstract) Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Purpose, Methods, Results, Conclusions. Matches STARD for Abstracts guidance.
3	Yes	Introduction describes clinical background of AKI in urosepsis and the intended role of urine biomarkers for early diagnosis.
4	Yes	"Purpose: To investigate the clinical value... for the early diagnosis of AKI." (Abstract) Clear objective and hypothesis.
5	Yes	"A retrospective study was carried out..." (Methods) Explicitly states retrospective design.
6	Yes	Inclusion/exclusion criteria listed under "General materials."
7	Yes	"Patients who underwent ureteroscopic holmium laser lithotripsy... diagnosed with urosepsis." (Methods) Basis: postoperative urosepsis.
8	Yes	"From January 2019 to April 2021, our hospital admitted..." (Methods) Specifies setting and dates.
9	No	No mention of consecutive, random, or convenience sampling.
10a	No	Describes ELISA for biomarkers but lacks sufficient detail (e.g., kit manufacturer only: "Shanghai Kexing Biotechnology Company"). Replication details missing.
10b	No	Reference standard: "Kidigo guideline" cited but not described in detail (e.g., specific criteria application).
11	No	No rationale provided for choosing Kidigo over other AKI diagnostic criteria.
12a	No	Cut-offs determined post hoc via ROC analysis (e.g., "best cut-off values" in Table 3). Not pre-specified.
12b	No	No mention of pre-specified reference standard cut-offs.
13a	No	Unclear if index test readers were blinded to reference standard results.
13b	No	Unclear if reference standard assessors were blinded to index test results.
14	Yes	"ROC analysis... AUC, sensitivity, specificity, 95% CI." (Results) Methods for accuracy measures described.
15	No	No mention of handling indeterminate results (e.g., missing values or ambiguous cases).
16	No	No description of missing data handling.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	No sample size justification or power calculation.
19	Yes	Flowchart provided (Fig. 1) showing participant enrollment.
20	Yes	Table 1 compares baseline demographics and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., staging) in AKI group.
21b	No	No distribution of alternative diagnoses in non-AKI group.
22	No	Time interval between index test (biomarker measurement) and reference standard (Kidigo criteria) not explicitly stated.
23	No	No 2x2 contingency table of index test vs. reference standard results.
24	Yes	"AUC (95% CI)" and sensitivity/specificity reported in Table 3 and Fig. 2.
25	No	No adverse events reported from biomarker testing or reference standard.
26	Yes	Limitations discussed: "single-center, small sample size... not explore mechanisms." (Discussion)

27	Yes	Conclusion states "important reference for early diagnosis of AKI." Clinical implications emphasized.
28	No	No registration number or registry name provided.
29	No	No mention of protocol availability.
30	Yes	"Sources of funding... Chinese Medical Association" (Footer). Role of funders not specified, but sources declared.

Hjortrup 2015

Item No.	Assessment	Support for Assessment
1	Yes	"Areas under receiver-operating characteristics curve (AuROC) for predicting use of RRT..." (Explicitly uses AUC as a measure of diagnostic accuracy).
2	Yes	Structured abstract with Background, Methods, Results, and Conclusions sections.
3	Yes	Background describes AKI in sepsis, limitations of plasma creatinine, and NGAL's potential role as a biomarker.
4	Yes	"The aim of this prospective observational study was to assess the value of plasma and urine NGAL to predict use of RRT and AKI..." (Clear objectives stated).
5	Yes	"This was a prospective observational study..." (Data collection planned before index test/reference standard).
6	Yes	Inclusion/exclusion criteria detailed under "Materials and methods" (e.g., severe sepsis needing fluid resuscitation, exclusion of RRT prior to enrolment).
7	Yes	Patients identified based on "severe sepsis criteria" and enrollment in the 6S trial.
8	Yes	"Three general intensive care units (ICUs) in Denmark... from March 2010 through November 2011." (Setting and dates specified).
9	No	"A convenience sample was used..." (Non-consecutive/non-random sampling).
10a	Yes	NGAL measurement described: "plasma and urine NGAL measured using particle-enhanced turbidimetric immunoassay... on a Cobas C501." (Replicable details).
10b	Yes	Reference standards defined: "use of RRT in ICU" and "AKI according to KDIGO plasma creatinine criteria."
11	No	No explicit rationale provided for choosing KDIGO criteria over other AKI definitions.
12a	No	Cut-offs determined post hoc using ROC curves ("optimal threshold... calculated from the upper left corner of the ROC curve"). No pre-specified thresholds.
12b	Yes	KDIGO criteria for AKI are pre-defined and referenced.
13a	Yes	"Laboratory technicians blinded to patient data." (Reference standard results unavailable to index test performers).
13b	Unclear	Not explicitly stated whether assessors of RRT/AKI were blinded to NGAL results. Assumed "No" if no mention.
14	Yes	"AuROC values... calculated... with 95% confidence intervals." (Appropriate statistical methods).
15	Yes	"Samples with NGAL levels above the measuring range were diluted... and reanalysed." (Handling of indeterminate results).
16	No	No description of handling missing data (e.g., 162 urine samples vs. 211 plasma samples).

17	No	Variability analyses (e.g., subgroup analyses) performed but not distinguished as pre-specified or exploratory.
18	No	No sample size calculation or justification provided.
19	Yes	Participant flow diagram (Fig. 1) included.
20	Yes	Baseline demographics and clinical characteristics summarized in Table 1.
21a	No	Severity distributions (e.g., AKI stages) not explicitly reported.
21b	No	Alternative diagnoses in non-AKI patients not described.
22	No	Time interval between NGAL sampling and reference standard (RRT/AKI) not specified.
23	No	No 2x2 contingency table for index test vs. reference standard results.
24	Yes	"AuROC 0.70 (95% CI 0.61–0.78)..." (Accuracy estimates with confidence intervals).
25	No	No mention of adverse events from NGAL testing or RRT.
26	Yes	Limitations discussed: convenience sampling, survival bias, and confounding factors (e.g., sepsis inflammation).
27	Yes	Conclusions state NGAL's low predictive value, implying limited clinical utility.
28	No	No registration number or registry name provided.
29	No	No mention of where the full protocol can be accessed.
30	Yes	Funding sources disclosed: BioPorto, Danish Strategic Research Council, etc.

Hu 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity and specificity of uNGAL and sCr for the diagnosis of AKI... were evaluated using the receiver operating characteristic (ROC) curve." (Abstract, Results). Explicitly mentions sensitivity, specificity, and AUC.
2	Yes	The abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background describes AKI's clinical challenges and the rationale for uNGAL as a biomarker (Introduction).
4	Yes	"The aim of this study was to evaluate the predictive value of urinary neutrophil gelatinase-associated lipid (uNGAL)..." (Abstract).
5	Yes	"110 patients were prospectively enrolled..." (Methods). Prospective design confirmed.
6	Yes	Inclusion/exclusion criteria listed under "Inclusion Criteria" and "Exclusion Criteria."
7	Yes	Participants identified based on sepsis diagnostic criteria and ICU admission (Methods).
8	Yes	"From September to December 2012" at ICUs of 3 hospitals (Methods).
9	Yes	"110 consecutive patients" (Methods). Consecutive series.
10a	Yes	uNGAL measurement details: sample collection, centrifugation, analyzer, reagents (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI diagnosis (Methods).

11	No	No explicit rationale provided for choosing KDIGO over other AKI criteria (e.g., AKIN).
12a	No	uNGAL cutoff (170 ng/mL) derived from ROC analysis; no pre-specified rationale.
12b	Yes	KDIGO criteria for AKI (sCr increase, urine output) are pre-specified (Methods).
13a	No	Unclear if uNGAL assessors were blinded to reference standard results.
13b	No	Unclear if reference standard assessors were blinded to uNGAL results.
14	Yes	ROC curves, AUC, sensitivity, specificity, and 95% CIs reported (Results).
15	No	No mention of handling indeterminate results for uNGAL or KDIGO.
16	No	No description of missing data handling.
17	No	No analyses of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Table 1 reports demographics (age, gender, vital signs).
21a	No	Severity distribution of AKI (e.g., KDIGO stages) not provided.
21b	No	Alternative diagnoses in non-AKI patients not described.
22	No	Time interval between uNGAL and KDIGO assessments not specified.
23	No	No cross-tabulation (2x2 table) of uNGAL vs. KDIGO results.
24	Yes	AUC = 0.828 (95% CI: 0.742–0.914) for uNGAL (Results).
25	No	No adverse events reported.
26	Yes	Limitations include small sample size and single-center design (Conclusion).
27	Yes	"uNGAL could be used as an indicator for early diagnosis..." (Conclusion).
28	No	No registration number or registry name.
29	No	No mention of a publicly available study protocol.
30	No	Funding sources not declared; only mentions institutional ethics approval.

Chang 2015

Item No.	Assessment	Support for Assessment
1	Yes	"For predicting intrinsic AKI, both urinary NGAL and calprotectin displayed excellent areas under the receiver operating characteristic curve (AUROC)" (Abstract). Explicitly uses AUROC as a measure of accuracy.
2	Yes	Abstract includes structured sections: background, methods, results, and conclusions (e.g., "This was a prospective observational study... Our result revealed...").

3	Yes	Introduction discusses AKI classification challenges and clinical role of biomarkers (e.g., "novel biomarkers... helpful for early prediction... clinical decisions").
4	Yes	"The purpose of this research was to exam whether NGAL and calprotectin can distinguish intrinsic from prerenal disease" (Introduction). Objectives clearly stated.
5	Yes	"This was a prospective observational study" (Abstract). Data collection planned before index/reference tests.
6	Yes	Inclusion/exclusion criteria detailed: age >65, comorbidities, kidney stressors, dialysis exclusion, etc. (Materials and Methods).
7	Yes	Participants identified based on "comorbidities of AKI" and "kidney stressors" (e.g., AMI, shock, sepsis; Materials and Methods).
8	Yes	"CCU of a tertiary care university hospital... between September 2012 and August 2013" (Materials and Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling. Stated as "prospective" but method of participant selection unclear.
10a	Yes	Urinary NGAL and calprotectin methods described in detail (ELISA kits, storage conditions, coefficients of variability; Materials and Methods).
10b	Yes	Reference standard defined using KDIGO criteria: "SCr levels ≥0.3 mg/dL within 48 hours or ≥1.5 times increase... within 7 days" (Materials and Methods).
11	No	No rationale provided for choosing KDIGO over alternatives (e.g., AKIN/RIFLE).
12a	No	Cut-offs for biomarkers determined via ROC analysis (post hoc), not pre-specified. No mention of pre-defined thresholds.
12b	Yes	KDIGO criteria for AKI (e.g., SCr thresholds) were pre-specified and cited as guidelines (Materials and Methods).
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"AUROC analysis calculated cut-off values, sensitivity, specificity" (Statistical Analysis section).
15	No	No description of handling indeterminate index/reference test results (e.g., missing/uninterpretable samples).
16	No	Excluded 4 patients but did not elaborate on handling missing data for other cases.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	Sample size calculation described: "minimum sample size of 72... using Mann–Whitney U test" (Materials and Methods).
19	No	No participant flow diagram provided (only text: "151 enrolled, 4 excluded, 147 analyzed").
20	Yes	"Baseline demographic and clinical characteristics" reported (e.g., mean age 67, comorbidities; Results).
21a	No	Severity distribution of intrinsic AKI (e.g., KDIGO stages) not explicitly reported.
21b	No	No distribution of alternative diagnoses in non-AKI patients provided.
22	Yes	Time interval defined: biomarkers measured at admission, AKI assessed within 7 days (Materials and Methods).
23	No	No 2x2 contingency table comparing index test results with reference standard.
24	No	AUROC values reported but no confidence intervals or precision estimates (e.g., "AUROC of 0.946").
25	No	No adverse events from biomarker testing or reference standard mentioned.
26	Yes	Limitations discussed: single-center design, sample size, potential confounders (Discussion).
27	Yes	Implications for practice: "careful inspection... early intervention... might improve outcomes" (Abstract).

28	No	No trial registration number or registry name provided.
29	No	No statement on accessibility of the full study protocol.
30	Yes	Funding sources disclosed: "Ministry of Science and Technology... Chang Gung Memorial Hospital" (Footnote).

Lee 2021

Item No.	Assessment	Support for Assessment
1	Yes	"the AUROC of urinary L-FABP in predicting postoperative AKI within 7 days was 0.720...0.742" (Abstract). Explicitly reports AUC as a measure of diagnostic accuracy.
2	Yes	Structured abstract includes sections: Introduction, Materials and Methods, Results, and Conclusions.
3	Yes	"Urinary L-FABP is considered a potential biomarker of AKI...intended use in high-risk populations" (Introduction). Describes clinical role of the index test.
4	Yes	"This study aims to examine...improve the discriminatory ability of L-FABP in postoperative AKI" (Abstract). States objectives and hypothesis.
5	Yes	"This prospective study was performed...between August 2015 and July 2018" (Methods 2.1). Confirms prospective design.
6	Yes	Inclusion/exclusion criteria detailed in Methods 2.1 (e.g., age ≥20, eGFR ≥30 mL/min, etc.).
7	Yes	"Patients admitted to the cardiac surgery ICU after cardiovascular surgery" (Methods 2.1). Basis: post-surgical ICU admission.
8	Yes	"tertiary care referral center in Taiwan...August 2015 to July 2018" (Methods 2.1). Specifies setting and dates.
9	Yes	"144 consecutive patients" (Results 3.1). Consecutive enrollment stated.
10a	Yes	"Urinary L-FABP levels were measured...using enzyme-linked immunosorbent assay kits" (Methods 2.3). Replicable details provided.
10b	Yes	"AKI was confirmed...KDIGO clinical practice guidelines" (Methods 2.4). Reference standard defined.
11	No	No rationale provided for choosing KDIGO over alternative criteria (e.g., RIFLE, AKIN).
12a	No	Cutoffs determined post hoc via Youden index ("optimal cutoff value...estimated the Youden index"; Methods 2.5). Not pre-specified.
12b	Yes	KDIGO criteria are pre-specified and standardized (Methods 2.4).
13a	No	No mention of blinding or whether clinical information was available to L-FABP test performers.
13b	No	No mention of blinding or whether L-FABP results were available to AKI assessors.
14	Yes	"AUROC...estimates of diagnostic accuracy" (Abstract, Methods 2.5). Methods for accuracy measures described.
15	No	No discussion of indeterminate/missing L-FABP or reference standard results.
16	No	No description of handling missing data for L-FABP or AKI assessment.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup differences).
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram included.

20	Yes	Table 1 lists baseline demographics and clinical characteristics.
21a	No	Severity distribution of AKI (e.g., KDIGO stages) not reported.
21b	No	No distribution of alternative diagnoses in non-AKI patients provided.
22	Yes	"Urinary L-FABP levels...examined at 4–6 and 16–18 h postoperatively" (Abstract); AKI assessed within 7 days (Methods 2.4). Time interval clarified.
23	No	No 2x2 table or cross-tabulation of L-FABP results vs. AKI status.
24	No	AUROC reported without 95% confidence intervals (e.g., "AUROC of 0.720"; Results 3.1).
25	No	No adverse events from L-FABP testing or reference standard mentioned.
26	Yes	"Study limitations...single-center design...no cost-effectiveness analysis" (Discussion). Limitations discussed.
27	Yes	"Implications for practice...assessing CPB duration first improves predictive accuracy" (Abstract). Clinical role emphasized.
28	No	No registration number or registry name provided.
29	No	No statement on full protocol accessibility.
30	Yes	"Funding: Chang Gung Memorial Hospital...No conflict of interest" (end of text). Funding sources disclosed.

Wang 2017

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the ROC curve (AUC) of [TIMP-2]•[IGFBP7] at 4 h after ICU admission was 0.80 (95% confidence interval (CI): 0.68–0.91) for development of AKI and 0.83 (95% CI: 0.69–0.96) for development of stage 2–3 AKI." (Abstract, Results)
2	Yes	Structured abstract with Background, Methods, Results, Conclusions. (Abstract)
3	Yes	"Early risk assessment for AKI remains a challenge... urinary [TIMP-2]•[IGFBP7] identifies patients at risk." (Abstract, Background)
4	Yes	"The primary analysis was prediction of AKI... assessed using ROC analysis." (Abstract, Methods)
5	Yes	"prospective observational study... urine samples were collected prospectively." (Methods)
6	Yes	"Exclusion criteria: age <18 years, chronic dialysis, prior renal transplantation." (Methods)
7	Yes	"Adult patients were screened for enrollment prior to cardiac surgery." (Methods)
8	Yes	"Zhongshan Hospital in Shanghai, China, between May 01, 2016 to May 31, 2016." (Methods)
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	"Urine samples analyzed using NephroCheck Test and Astute140 Meter... units of $(ng/mL)^2/1000$." (Methods)
10b	Yes	"AKI defined by KDIGO criteria (serum creatinine and urine output)." (Methods)
11	Yes	"As in prior studies... KDIGO criteria used for AKI staging." (Methods)
12a	Yes	"Cutoffs of 0.3 (high sensitivity) and 2.0 (high specificity) were used." (Results, Table 2)
12b	Yes	"Stage 2–3 AKI defined as KDIGO stage 2 or 3." (Methods)

13a	No	No mention of blinding index test performers to reference standard results.
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	"ROC curves, AUC, sensitivity, specificity, NPV, PPV calculated using bootstrap CI." (Methods)
15	No	No discussion of handling indeterminate test results.
16	No	No mention of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No justification for sample size (n=57).
19	No	Text describes flow but no diagram provided.
20	Yes	"Table 1: Baseline demographic and clinical characteristics." (Results)
21a	Yes	"20 (35%) developed AKI, 6 (11%) stage 2–3 AKI." (Results)
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No explicit mention of time interval between index test and reference standard application.
23	No	Operating characteristics provided (Table 2), but no cross-tabulation of results.
24	Yes	"AUC 0.80 (95% CI: 0.68–0.91)... sensitivity 75%, specificity 100%." (Results)
25	No	No mention of adverse events from biomarker testing.
26	Yes	"Study limitations: small sample size, single-center design." (Discussion)
27	Yes	"Implies clinical utility for early AKI risk assessment." (Conclusion)
28	No	No trial registration number provided.
29	No	No statement on protocol availability.
30	No	Funding sources not explicitly stated; only Creative Commons license mentioned.

Wang 2023

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver operating curve (ROC) analysis was used to evaluate the efficacy of serum cystatin C in predicting persistent AKI... AUC = 0.711... sensitivity of 100% and specificity of 90.9%" (Explicit use of diagnostic accuracy measures).
2	Yes	Structured abstract includes "Background and study aims," "Patients and Methods," "Results," and "Conclusion."
3	Yes	Introduction describes clinical relevance of AKI in AP and rationale for using Cys C as a predictor.
4	Yes	"We investigated the value of the serum cystatin C level as a potential predictor..." (Explicit objective).
5	Yes	"We retrospectively examined patients..." (Data collected after index/reference tests).
6	Yes	"Inclusion and exclusion criteria" clearly listed under "Patients and Methods."

7	Yes	Participants identified based on AP diagnosis (symptoms, lab tests, imaging).
8	Yes	"Department of Gastroenterology in a major regional hospital in Yangzhou, China... between January 2013 and December 2018."
9	No	No mention of consecutive, random, or convenience sampling; retrospective design implies convenience series but not explicitly stated.
10a	Yes	"Serum cystatin C measurements... using latex particle-enhanced immunoturbidimetry... reference range 0.55–1.05 mg/L" (Replicable details).
10b	Yes	AKI defined using KDIGO-like criteria (creatinine increase ≥0.3 mg/dL or urine output thresholds).
11	No	No rationale provided for choosing AKI criteria over alternatives.
12a	Yes	Cut-off of 1.055 mg/L derived from ROC analysis; pre-specified as ≥1.05 mg/L in methods.
12b	Yes	AKI thresholds align with clinical guidelines (pre-specified).
13a	No	No mention of blinding; retrospective design likely allowed access to clinical data.
13b	No	No mention of blinding for reference standard assessors.
14	Yes	"ROC analysis... AUC, sensitivity, specificity" (Methods for accuracy estimation).
15	Yes	Exclusion of patients lacking Cys C data: "patients lacking serum cystatin C values" (Handling missing data).
16	Yes	Same as Item 15; missing data explicitly excluded.
17	No	No analysis of variability in accuracy measures (e.g., subgroups).
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram.
20	Yes	Table 1 compares demographics (age, BMI, sex) between groups.
21a	Yes	SAP severity distribution compared between groups (Table 3).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between Cys C measurement and AKI diagnosis not specified.
23	No	No cross-tabulation (2x2 table) of Cys C vs. AKI results.
24	Yes	"AUC = 0.711... 95% CI: 0.894–0.937" (Precision estimates).
25	No	No mention of adverse events from Cys C testing.
26	Yes	Limitations: "retrospective design... single-center study."
27	Yes	"Cystatin C level at admission can reflect a patient's initial renal function status" (Implications for practice).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	"Ethical approval... granted by the ethics committee..." and funding sources listed under affiliations.

Xie 2019

Item	Assessment	Support for Assessment

No.		
1	No	The study focuses on prognostic value of [TIMP-2]·[IGFBP7] for adverse outcomes (e.g., mortality, CRRT), not diagnostic accuracy measures (e.g., sensitivity, specificity). Results report odds ratios and survival analysis but no traditional diagnostic accuracy metrics.
2	Yes	Abstract includes structured sections: background ("prognostic value..."), methods ("cohort study"), results ("Kaplan-Meier curves..."), and conclusions ("[TIMP-2]·[IGFBP7] values can serve to identify patients...").
3	Yes	Background describes AKI's clinical significance and the role of [TIMP-2]·[IGFBP7] as a biomarker. Mentions FDA approval of NephroCheck for AKI risk assessment.
4	Yes	Explicit hypothesis: "Our hypothesis is that [TIMP-2]·[IGFBP7] can serve as a biomarker for predicting adverse outcomes in critically ill patients."
5	No	No explicit statement on whether data collection was prospective or retrospective. Mentions "cohort study" but does not clarify timing of data planning.
6	No	Eligibility criteria (e.g., inclusion/exclusion) are not explicitly defined in the provided text.
7	No	Basis for identifying participants (e.g., symptoms, prior tests) is not described. Only states "critically ill patients admitted to the ICU."
8	Yes	States enrollment location (San Bortolo Hospital) and dates (June 1, 2016–July 31, 2017).
9	No	No information on whether participants were consecutive, random, or convenience samples.
10a	Yes	Index test ([TIMP-2]·[IGFBP7]) described with cutoffs (>0.3 and >2.0) and methodology (NephroCheck test).
10b	Yes	Reference standard (KDIGO criteria for AKI) is clearly stated.
11	No	No rationale provided for choosing KDIGO criteria over other AKI definitions (e.g., RIFLE, AKIN).
12a	Yes	Predefined cutoffs for [TIMP-2]·[IGFBP7] (>0.3 and >2.0) are mentioned as FDA-approved thresholds.
12b	No	KDIGO criteria are referenced but no rationale for its cutoffs or categories is provided.
13a	No	No information on blinding of index test performers to clinical data or reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	No	Methods focus on prognostic outcomes (e.g., Cox regression, Kaplan-Meier) rather than diagnostic accuracy measures.
15	No	No description of handling indeterminate test results (e.g., missing or borderline values).
16	No	No mention of missing data handling for index or reference tests.
17	No	No analyses of variability in accuracy measures (e.g., subgroup analyses by severity).
18	No	No stated sample size justification or power calculation.
19	No	No participant flow diagram in the provided text; only narrative description of enrollment.
20	Yes	Table 1 details baseline demographics and clinical characteristics (age, BMI, comorbidities, etc.).
21a	No	No distribution of AKI severity (e.g., KDIGO stages) in the target population.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test and reference standard (AKI diagnosis) is not specified.
23	No	No cross-tabulation of index test vs. reference standard results (e.g., 2x2 table).

24	No	No diagnostic accuracy estimates (e.g., AUC, sensitivity); only prognostic outcomes reported.
25	No	Adverse events from tests are not mentioned.
26	Yes	Limitations discussed: single-center design, lack of long-term outcomes, and potential confounding factors.
27	Yes	Implications for practice stated: "[TIMP-2]·[IGFBP7] values can identify AKI patients at increased risk."
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	No	Funding sources mentioned (IRRIV) but no detailed role of funders or other support.

Kounatidis 2024

Item No.	Assessment	Support for Assessment
1	No	The article is a review discussing pathogenesis, biomarkers, and therapies of SA-AKI, not a primary diagnostic accuracy study. No measures of accuracy (e.g., sensitivity, specificity) are evaluated.
2	No	The structured abstract summarizes the review's purpose, content, and conclusions but does not describe study design, methods, or original results. Example: "The aim of this review is to provide an updated synopsis..."
3	Yes	The background section describes the clinical role of SA-AKI biomarkers and diagnostic criteria. Example: "SA-AKI is defined as... KDIGO criteria... Several serum and urinary diagnostic biomarkers... are discussed."
4	Yes	Objectives are explicitly stated: "The aim of this review is to provide an updated synopsis... analyze phenotypes... discuss biomarkers and therapeutic approaches."
5	No	No mention of prospective/retrospective data collection, as this is a review, not an original study.
6	No	Eligibility criteria for primary studies are not provided in this review.
7	No	Basis for identifying participants (e.g., symptoms, prior tests) is not applicable to a review.
8	No	Setting/location/dates of participant identification are absent (not relevant for a review).
9	No	Participant series (consecutive, random, etc.) are not discussed.
10a	No	Index test details (e.g., replication protocols) are not provided; biomarkers are discussed generally.
10b	No	Reference standard (e.g., KDIGO criteria) is described but lacks replication details. Example: "AKI is defined by KDIGO..."
11	No	Rationale for reference standard choice (e.g., alternatives) is not explicitly addressed.
12a	No	Test positivity cut-offs for biomarkers are mentioned (e.g., "serum creatinine ≥0.3 mg/dL") but not analyzed for diagnostic accuracy.
12b	No	Reference standard cut-offs (KDIGO criteria) are defined but lack rationale for thresholds.
13a	No	Blinding of index test performers to reference standard results is not discussed.
13b	No	Blinding of reference standard assessors to index test results is not addressed.

14	No	Methods for estimating diagnostic accuracy (e.g., statistical models) are absent.
15	No	Handling of indeterminate/missing data is not applicable to a review.
16	No	Missing data handling is not discussed.
17	No	Variability analyses (pre-specified vs. exploratory) are absent.
18	No	Intended sample size or power calculations are not provided.
19	No	No participant flow diagram is included.
20	No	Baseline demographic/clinical characteristics of participants are not reported.
21a	No	Disease severity distribution in target condition is not analyzed.
21b	No	Alternative diagnoses in non-target condition are not discussed.
22	No	Time interval between index test and reference standard is not specified.
23	No	Cross-tabulation of index vs. reference standard results is absent.
24	No	Diagnostic accuracy estimates (e.g., confidence intervals) are not provided.
25	No	Adverse events from tests are not reported.
26	Yes	Study limitations are addressed: "Although more evidence is still necessary... lack of consensus definitions..."
27	Yes	Implications for practice are discussed: "potential therapeutic targets... early diagnosis... personalized management."
28	No	Registration number/registry name is absent.
29	No	Full study protocol accessibility is not mentioned.
30	Yes	Funding sources are declared: "This research received no external funding." (Declared under "Funding" section).

Zaouter 2018

Item No.	Assessment	Support for Assessment
1	Yes	"The primary objective was to determine the predictive value of these new markers... with an area under the receiver-operating characteristic curve of 0.69 [0.53–0.84]." Mentions sensitivity (65%), specificity (62%), and AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction explains CSA-AKI, limitations of current criteria, and clinical role of RRI and urinary biomarkers.
4	Yes	"The hypothesis... was that these new markers could predict CSA-AKI earlier than the KDIGO criteria."
5	Yes	"In a prospective observational trial, we studied 50 patients..."
6	Yes	Inclusion/exclusion criteria listed under "Participants" (age >60, diabetes, etc.).
7	Yes	"Patients were enrolled... if they presented at least two of the following risk factors..." (symptoms/previous tests).
8	Yes	"Bordeaux University Hospital... from September 2014 to November 2014."

9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	RRI methodology: "interlobar arteries interrogated... formula: (peak systolic velocity – end-diastolic velocity)/peak systolic velocity." Urinary proteins measured via NephroCheck®.
10b	Yes	Reference standard: KDIGO criteria with urine output and serum creatinine.
11	Yes	"Current guidelines recommend the use of KDIGO criteria..." (rationale for reference standard).
12a	No	Cutoff (0.3) derived post hoc: "The best sensitivity (65%) and specificity (62%) was achieved for a cutoff value..." (exploratory, not pre-specified).
12b	Yes	KDIGO criteria cutoffs (e.g., urine output <0.5 mL/kg/h for 6h) are pre-specified.
13a	No	"Researchers collecting the RRI values... were blinded to the urinary proteins concentration." Implies no access to reference standard results.
13b	No	No explicit statement; reference standard (KDIGO) based on creatinine/urine output collected independently.
14	Yes	"Estimates of diagnostic accuracy... AUC, sensitivity, specificity, ROC curves."
15	No	No mention of handling indeterminate/missing RRI or biomarker results.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No justification for sample size (n=50).
19	No	No participant flow diagram.
20	Yes	"Baseline demographic and clinical characteristics" table included.
21a	No	Severity distribution (KDIGO stages) of AKI not reported.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals between index tests (H1, H4, etc.) and reference standard (daily creatinine) specified.
23	No	No 2x2 contingency table or cross-tabulation of test results.
24	Yes	"AUC of 0.78 [0.62–0.93]" with 95% confidence intervals.
25	No	No adverse events reported.
26	Yes	Limitations: "small sample size," "single-center," and "selected population."
27	Yes	"Neither marker detect CSA-AKI... within the first 24 postoperative hours" (implications for clinical use).
28	Yes	"Registered on clinicaltrials.gov (NCT02325726)."
29	No	No link or statement about protocol availability.
30	No	Funding sources and role of funders not declared.

Yu 2022

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity of 13% and specificity of 82%" (Abstract Results). Reports sensitivity, specificity, PPV, NPV, and AUC.

2	Yes	Abstract includes structured sections: Background, Materials and methods, Results, Conclusions.
3	Yes	Introduction discusses AKI prevalence, mechanisms, and clinical role of biomarkers for early detection.
4	Yes	"The purpose of this study is to validate the use of these urinary biomarkers..." (Abstract).
5	Yes	"In a single-center prospective observational study..." (Abstract Methods).
6	Yes	Exclusion criteria: emergent surgery, eGFR <20, dialysis patients (Materials and methods).
7	Yes	"All patients who underwent cardiac surgery... with cardiopulmonary bypass in September 2021 and October 2021" (Methods).
8	Yes	"North Shore University Hospital... September 2021 and October 2021" (Methods).
9	Yes	"108 consecutive patients" (Abstract Methods).
10a	Yes	"urine samples were collected... analyzed using NephroCheck" (Methods). Thresholds (>0.3) and replication details provided.
10b	Yes	"AKI defined by KDIGO criteria (serum creatinine ≥0.3 mg/dL or 50% increase)" (Methods).
11	No	No rationale provided for choosing KDIGO over other reference standards.
12a	Yes	"threshold of >0.3 (pre-specified)... ROC analysis explored alternative cut-offs" (Results).
12b	No	KDIGO criteria applied without justification for its cut-offs.
13a	No	No mention of whether clinical/reference standard information was available to biomarker testers.
13b	No	No mention of whether biomarker results were available to AKI assessors.
14	Yes	"Sensitivity, specificity, PPV, NPV... ROC curves" (Methods/Results).
15	No	No discussion of indeterminate index test or reference standard results.
16	No	No mention of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram; textual description only.
20	Yes	Table 1 details demographics, comorbidities, and surgical characteristics.
21a	Yes	"18/19 patients had stage 1 AKI" (Results).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Biomarkers measured post-CPB and postoperative day 1; AKI assessed within 48h (Methods).
23	No	Sensitivity/specificity reported but no 2x2 table of test vs. reference standard results.
24	Yes	"sensitivity of 13% (95% CI)... AUROC 0.40" (Results with confidence intervals).
25	No	No adverse events reported from biomarker testing.
26	Yes	Limitations: single-center, small sample, possible selection bias (Discussion).
27	Yes	Conclusion states biomarkers were not predictive, guiding clinical use (Abstract/Discussion).
28	No	No trial registration number or registry name provided.
29	No	No link or reference to a publicly available study protocol.

30	No	No funding sources or role of funders mentioned; IRB approval noted but unrelated to funding.

Kashani 2013

Item No.	Assessment	Support for Assessment
1	Yes	"AUC of 0.80 (0.76 and 0.79 alone)" (Abstract). Explicit use of AUC as a diagnostic accuracy measure.
2	Yes	Structured abstract includes design, methods, results, and conclusions (Abstract).
3	Yes	Background discusses AKI diagnostic challenges and clinical role of biomarkers (Introduction).
4	Yes	Objectives stated: "identify and validate novel biomarkers of AKI" (Abstract and Introduction).
5	Yes	"Prospective, multicenter investigation" (Introduction); data collection planned prospectively.
6	Yes	Eligibility criteria detailed in "Subjects" and exclusion of AKI stage 2-3 at enrollment (Methods).
7	Yes	Participants identified based on ICU admission, critical illness, and AKI risk factors (Methods).
8	No	Locations described ("35 sites in North America and Europe"), but dates not specified.
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Index test (urinary [TIMP-2]·[IGFBP7]) described with assay methods (Methods and Laboratory methods).
10b	Yes	Reference standard: KDIGO criteria using sCr and urine output (Clinical endpoints).
11	No	No rationale provided for choosing KDIGO over other AKI criteria (e.g., RIFLE/AKIN).
12a	No	Cut-offs for biomarker positivity determined via ROC analysis (exploratory, not pre-specified).
12b	Yes	KDIGO criteria for AKI stages 2-3 were pre-specified (Clinical endpoints).
13a	Yes	"Technicians blinded to clinical data" during biomarker analysis (Sample and data collection).
13b	No	No information on whether reference standard assessors were blinded to index test results.
14	Yes	AUC, sensitivity, specificity, and statistical methods described (Statistical analysis).
15	No	No details on handling indeterminate index test or reference standard results.
16	Yes	16 excluded due to missing data or invalid results (Figure 1 legend).
17	No	Variability analyses (subgroups/sensitivity) performed but not distinguished as pre-specified.
18	Yes	Sample size justified based on Discovery study results (Additional file 1).
19	Yes	Participant flow diagram provided (Figure 1).
20	Yes	Baseline demographics and clinical characteristics reported (Results and tables).
21a	Yes	Distribution of AKI severity (stages 1-3) reported (Results and Figure 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients provided.
22	Yes	Time interval: samples collected ≤18h before reference standard (Clinical endpoints).
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.

24	Yes	AUC estimates with 95% CIs reported (Abstract and Results).
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed, including heterogeneity and statistical uncertainty (Discussion).
27	Yes	Implications for AKI risk stratification and clinical use highlighted (Conclusions).
28	Yes	Registration number NCT01209169 provided (Abstract).
29	No	No statement on accessibility of the full study protocol.
30	Yes	Funding sources and role of Astute Medical disclosed (End of article).

Li 2012

Item No.	Assessment	Support for Assessment
1	Yes	"Standard statistics were used along with receiver-operating characteristic (ROC) analysis to evaluate the diagnostic value... AUCs of NGAL were 0.766, 0.773, and 0.773" (Abstract). Explicit use of AUC as a measure of diagnostic accuracy.
2	Yes	Structured abstract includes "Objective," "Methods," "Results," and "Conclusion" sections (Abstract).
3	Yes	Introduction discusses limitations of traditional AKI biomarkers and rationale for evaluating NGAL/L-FABP in liver transplant recipients (Introduction).
4	Yes	"Objective: We examined the value of two potential novel urinary biomarkers... in diagnosing AKI" (Abstract). Clear hypothesis stated.
5	Yes	"We prospectively enrolled patients" (Methods). Data collection planned before index/reference tests.
6	Yes	Inclusion/exclusion criteria listed under "Patient population" (e.g., age ≥18, no preexisting CKD/AKI).
7	Yes	Participants identified based on ESLD diagnosis and scheduled liver transplantation (Methods: "patients with ESLD who were scheduled to undergo primary liver transplantation").
8	Yes	"Shanghai Jiaotong University... December 2007 to December 2008" (Methods). Setting, location, and dates provided.
9	No	No explicit statement on whether participants were consecutive, random, or convenience-based.
10a	Yes	Detailed ELISA methods for urinary NGAL and L-FABP (Methods: "ELISA for quantitation..."). Replicable protocol.
10b	Yes	Reference standard defined as AKIN criteria: "AKI was defined as an absolute increase in Scr... within 48 h" (Methods).
11	No	No rationale provided for choosing AKIN criteria over other AKI definitions (e.g., KDIGO).
12a	No	Cut-offs for NGAL/L-FABP derived from ROC analysis but not pre-specified (Results: "Cut-off value of 43.02 ng/mgUcr..."). Exploratory analysis.
12b	Yes	AKIN criteria (reference standard) used pre-specified thresholds (50% Scr increase).
13a	No	No mention of blinding; unclear if index test performers had access to reference standard results.
13b	No	No mention of blinding for reference standard assessors.
14	Yes	"ROC analysis... AUC was calculated" (Methods). Methods for accuracy estimation described.
15	No	No description of handling indeterminate/missing test results (e.g., excluded samples).

16	No	Missing data handling not addressed.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation mentioned.
19	Yes	Figure 1 shows participant flow diagram (Results: "Figure 1 outlines the design...").
20	Yes	Table 1 summarizes baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity in AKI patients (e.g., AKI staging).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (urinary biomarkers) and reference standard (Scr) not explicitly defined.
23	No	No 2x2 contingency table comparing index test results against reference standard.
24	No	AUCs reported but no confidence intervals (e.g., "AUCs of NGAL were 0.766...").
25	Yes	"No patient died and in no case renal replacement therapy (RRT) was required" (Results). Adverse events partially addressed.
26	Yes	Limitations discussed: "small sample size... single-center study" (Discussion).
27	Yes	Conclusion states "NGAL... sensitive and specific marker of AKI," implying clinical utility.
28	No	No registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	Partial/No	Funding sources listed (e.g., "Shanghai Jiaotong University") but no role of funders described. STARD requires explicit reporting; thus "No".

Khawaja 2019

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve (AUC) at12hr was 0.82 (95% CI 0.68–0.96) with a sensitivity of 70.8% and specificity of 90.9%." Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: purpose, methods, results, conclusions. Example: "The purpose of this study was... In conclusion..."
3	Yes	Background discusses limitations of SCr and rationale for pNGAL: "There is a need for a reliable AKI biomarker... Plasma NGAL allows the diagnosis of AKI 48 h prior to a clinical diagnosis."
4	Yes	"The objective of this study is to assess the ability of pNGAL to predict early AKI in critically ill adult patients presenting with sepsis."
5	Yes	"A prospective study... recruited over a nine-month period." Indicates prospective data collection.
6	Yes	Inclusion/exclusion criteria described: "ages 18–60, admitted to ICU with suspected sepsis," and exclusion of CKD, pregnancy, etc.
7	Yes	Participants identified based on "suspected sepsis" defined by SIRS criteria.
8	Yes	"Conducted at... Aga Khan University Hospital... during December 2014 to August 2015."
9	No	No mention of consecutive, random, or convenience sampling. Recruitment method unclear.

10a	Yes	Detailed pNGAL methodology: "Three to four milliliters of blood... analyzed by fluorescence immunoassay on Triage® Meter Pro."
10b	Yes	Reference standard (RIFLE-SCr) defined: "A twofold increase in SCr from baseline value was considered as AKI."
11	No	Rationale for choosing RIFLE over alternatives not discussed. Only states it was "proposed by ADQI."
12a	Yes	Predefined pNGAL cutoff: "Cut off 150 ng/ml... used for the Prediction of Acute kidney injury."
12b	Yes	RIFLE-SCr criteria predefined: "twofold increase in SCr from baseline."
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Diagnostic accuracy... assessed by applying Receiver Operator Curve (ROC) analysis."
15	No	No mention of handling indeterminate results (e.g., missing samples or ambiguous test outcomes).
16	No	Excluded early deaths/discharged patients but did not describe handling of other missing data.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No justification for sample size (n=48) or power calculation.
19	Yes	Figure 1: Flow diagram of participant recruitment and outcomes.
20	Yes	Table 1: "Demographics and clinical details of patients."
21a	No	No distribution of AKI severity (e.g., RIFLE stages Risk, Injury, Failure).
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals specified: "Blood samples collected at 12 h, 24 h, and 48 h" vs. SCr at 48 h.
23	No	Sensitivity/specificity reported but no explicit 2x2 contingency table.
24	Yes	"AUC at12hr was 0.82 (95% CI 0.68–0.96)... AUCs at 24 h was 0.86 (95% CI 0.74–0.97)."
25	No	No mention of adverse events from pNGAL or SCr testing.
26	Yes	Limitations noted: "small sample size" and generalizability concerns in Discussion.
27	Yes	"Early identification of high-risk AKI... may allow earlier initiation of therapies."
28	No	No registration number or registry name provided.
29	No	Protocol accessibility not mentioned.
30	No	Funding sources not explicitly stated; only mentions Creative Commons license.

Imoto 2021

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analysis... AUC-ROC" (Abstract, Results). The study uses AUC to evaluate diagnostic accuracy.
2	Yes	Structured abstract with Background, Methods, Results, Conclusions.

3	Yes	Introduction discusses AKI prognosis, need for early diagnosis, and clinical role of biomarkers.
4	Yes	"Objectives: Compare AKI/non-AKI groups... evaluate U-NGAL and PCT" (Abstract, Methods).
5	No	No explicit statement on prospective/retrospective design. Methods state "observational study" without clarifying timing of data collection planning.
6	Yes	"126 patients... excluded 17 CPA and 3 RRT cases" (Methods).
7	Yes	Participants identified based on ICU admission and clinical conditions (e.g., sepsis, pancreatitis).
8	Yes	"Fukuoka University Hospital, April–October 2018" (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Detailed methods for U-NGAL and PCT measurement (kits, instruments).
10b	Yes	Reference standard: KDIGO criteria using Cr and urine output (Methods).
11	Yes	"KDIGO clinical practice guidelines... best available method" (Introduction).
12a	No	Cut-offs determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	KDIGO stages (e.g., Cr ≥0.3 mg/dl) predefined (Methods).
13a	No	Unclear if index test readers had access to reference standard results.
13b	No	Unclear if reference standard assessors had access to index test results.
14	Yes	"ROC curve analysis... AUC" (Statistical Analysis).
15	No	No mention of handling indeterminate results (e.g., missing test values).
16	No	Exclusion criteria stated, but no description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup comparisons).
18	No	No sample size justification or power calculation.
19	No	Text describes participant flow but no diagram.
20	Yes	Table 1 includes age, sex, BMI, and baseline characteristics.
21a	Yes	AKI severity distribution by stages 1–3 (Results, Table 3).
21b	No	Non-AKI group diseases listed (Table 1) but no detailed distribution of alternative diagnoses.
22	No	No explicit reporting of time intervals between index test and reference standard.
23	No	No 2x2 contingency table; results reported as AUC without cross-tabulation.
24	No	AUC values reported without confidence intervals (Table 4, Results).
25	No	No mention of adverse events from tests.
26	Yes	Limitations: single-center, small sample, no causality (Discussion).
27	Yes	"Measuring U-NGAL and PCT... improve AKI diagnosis" (Conclusions).
28	No	No registration number or registry name provided.
29	No	No link or statement about full protocol accessibility.

30	No	Funding sources not specified; only ethics approval and license mentioned.

Padhy 2014

Item No.	Assessment	Support for Assessment
1	Yes	"ROC was used to determine the optimum cut-off. Sensitivity (100%) and specificity (96.7%) were reported."
2	Yes	Structured abstract includes Background, Methods, Results, and Conclusions.
3	Yes	Background section describes clinical context and the need for early AKI biomarkers.
4	Yes	"We determined the optimum cut-off level of NGAL and cystatin C in early diagnosis..." (explicit objective).
5	No	No explicit statement on prospective/retrospective data collection planning.
6	Yes	Exclusion criteria: chronic nephropathy, infections, etc. ("Patients with... were excluded").
7	Yes	Participants identified based on undergoing PCI ("patients undergoing percutaneous coronary intervention").
8	No	No mention of specific dates or detailed settings beyond hospital names.
9	Yes	"30 controls were randomly chosen from the recruited patients."
10a	Yes	NGAL/cystatin C measured via ELISA kits (Biovendor) on Bio-Rad instruments (replicable details).
10b	Yes	Reference standard: serum creatinine ≥0.5 mg/dl at 48h, measured by Jaffe's method.
11	Yes	Serum creatinine described as the "most reliable marker" despite limitations (rationale provided).
12a	No	Cut-offs determined post hoc via ROC analysis (exploratory, not pre-specified).
12b	Yes	AKI defined by pre-specified creatinine criteria (≥0.5 mg/dl or 25% increase).
13a	No	No mention of blinding for index test performers to reference standard results.
13b	No	No mention of blinding for reference standard assessors to index test results.
14	Yes	"ROC was used... AUC, sensitivity, and specificity reported."
15	No	No description of handling indeterminate results (e.g., missing values or equivocal tests).
16	No	No discussion of missing data management.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	Sample size (n=250) not justified by power calculation or pre-specified criteria.
19	No	No participant flow diagram provided.
20	Yes	Tables 1-3 detail baseline demographics and clinical characteristics.
21a	No	Severity of AKI (e.g., staging) not described.
21b	No	Alternative diagnoses in non-AKI participants not reported.
22	Yes	Blood samples collected at 0, 4, 24, and 48h post-PCI (time intervals specified).
23	No	No 2x2 contingency table cross-tabulating index test vs. reference standard results.

24	No	Sensitivity/specificity reported without confidence intervals (only AUC p-values).
25	No	No adverse events from NGAL/cystatin C or creatinine tests mentioned.
26	No	Limitations section absent in Discussion/Conclusion.
27	Yes	Conclusion states NGAL/cystatin C "may act as early markers" for clinical use.
28	No	No registration number or registry name provided.
29	No	Protocol accessibility not mentioned.
30	No	Funding sources and roles not disclosed in the provided text.

Gaipov 2015

Item No.	Assessment	Support for Assessment
1	Yes	"A receiver operator characteristics (ROC) curve analysis showed higher predictive ability of SUA for progressing AKI compared with serum and urine NGAL." (Reports AUC as a measure of accuracy.)
2	Yes	Abstract includes structured sections: Objectives, Design and methods, Results, Conclusion.
3	Yes	Introduction discusses AKI complications, NGAL limitations, and SUA's role: "Determining which patient will...develop progressive AKI...is still challenging."
4	Yes	Objectives stated: "We aimed to study the role of serum and urine NGAL as well as SUA to predict progression of AKI."
5	Yes	"This is a prospective observational study of patients undergoing cardiac surgery."
6	Yes	Inclusion/exclusion criteria: age >18, eGFR >30 mL/min/1.73 m^2, elective surgery; exclusions: urgent surgery, recent MI.
7	Yes	"All patients consecutively admitted...were assessed for eligibility." (Identified based on admission to cardiovascular surgery.)
8	Yes	"Patients...underwent cardiac surgery...between July 2011 and February 2012" at Necmettin Erbakan University Hospital.
9	Yes	"All patients consecutively admitted...were assessed for eligibility." (Consecutive series.)
10a	Yes	Index tests (SUA, NGAL) described: blood/urine collection times (0h, 2h, 24h post-surgery), assay methods (BioVendor ELISA kit).
10b	Yes	Reference standard: KDIGO AKI criteria ("increase in serum creatinine by 0.3 mg/dL within 48 h or 1.5× baseline").
11	No	No rationale provided for choosing KDIGO over alternative AKI definitions (e.g., AKIN, RIFLE).
12a	No	Cut-offs for SUA/NGAL determined post-hoc via ROC analysis; no pre-specified thresholds mentioned.
12b	Yes	KDIGO criteria for AKI stages (pre-specified and referenced).
13a	No	Unclear if clinicians assessing AKI (reference standard) were blinded to SUA/NGAL results.
13b	No	No mention of blinding between index test results and reference standard assessment.
14	Yes	"ROC curve analysis...AUC...DeLong et al. method for comparing AUCs."
15	No	No description of handling indeterminate index test or reference standard results.

16	Yes	"15 patients excluded...due to missing data." (Missing data addressed via exclusion.)
17	No	No analysis of variability in diagnostic accuracy across subgroups or settings.
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram; text describes recruitment but lacks visual.
20	Yes	Table 1 reports demographics, comorbidities, lab values (age, gender, creatinine, eGFR, etc.).
21a	No	No distribution of AKI severity (e.g., stages) beyond progression status.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	No	No explicit reporting of time intervals between index tests (SUA/NGAL) and AKI diagnosis.
23	No	No cross-tabulation of index test results against reference standard (e.g., 2x2 table).
24	No	AUCs mentioned but no sensitivity, specificity, or confidence intervals reported.
25	No	No adverse events related to SUA/NGAL testing mentioned.
26	Yes	Limitations: small sample size, single-center design, lack of protocol registration.
27	Yes	"Uric acid seems to predict...RRT requirement...better than NGAL." (Implications for clinical use.)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	No	Funding sources and roles not declared in the manuscript.

Yuan 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The areas under the curve (AUC), sensitivity and specificity of the combined prediction were 0.97, 84.00% and 98.20%, respectively" (Explicitly reports diagnostic accuracy measures).
2	Yes	Structured abstract includes Objective, Methods, Results, and Conclusions sections.
3	Yes	"The clinical role of NGAL and β2-MG in predicting AKI in AP patients is explained, including their intended use as early biomarkers."
4	Yes	"Objective: This study aimed to explore the predictive value of [...] in patients with AP and AKI."
5	Yes	"The clinical data [...] were selected for retrospective analysis."
6	Yes	Inclusion/exclusion criteria listed under "General Information."
7	No	No description of how potentially eligible participants were identified (e.g., symptoms, prior tests).
8	Yes	"Treated in the study hospital from November 2019 to November 2022."
9	No	No mention of whether participants formed a consecutive, random, or convenience series.
10a	Yes	"Serum NGAL level was measured by [...] ELISA kit [...] stored at –80 °C for testing." (Detailed index test methodology).

10b	Yes	Reference standard: KDIGO guidelines for AKI diagnosis, including Scr and urine output criteria.
11	Yes	"The diagnostic standards of AKI referred to [...] KDIGO guidelines [...] the best available method."
12a	Yes	Cut-offs for NGAL/β2-MG positivity defined via ROC analysis (e.g., "Cutoff value: 95.71 μg/L for NGAL").
12b	No	No rationale for KDIGO diagnostic cut-offs (pre-specified vs. exploratory).
13a	Unclear	No explicit statement on whether reference standard results were available to index test performers.
13b	Unclear	No explicit statement on whether index test results were available to reference standard assessors.
14	Yes	"Logistic regression analysis [...] ROC curve [...] AUC, sensitivity, specificity."
15	No	No mention of handling indeterminate/missing test results.
16	No	No description of missing data management.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No intended sample size calculation or justification.
19	No	No participant flow diagram provided.
20	Yes	Table 1 compares baseline demographics/clinical characteristics between groups.
21a	No	No distribution of disease severity in AKI patients.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No time interval or clinical interventions between index test and reference standard.
23	No	No cross-tabulation of index test vs. reference standard results.
24	Yes	"AUC, sensitivity, specificity [...] 95% CI reported."
25	No	No adverse events reported.
26	Yes	"Study limitations [...] statistical uncertainty [...] generalisability" mentioned in Discussion.
27	Yes	"Their combination detection provides a reliable reference for [...] clinical AKI identification."
28	No	No registration number or registry name.
29	No	No study protocol accessibility statement.
30	Yes	Funding/support: "This is an open access article under the CC BY 4.0 license."

Haase-fielitz 2009

Item No.	Assessment	Support for Assessment
1	Yes	"The predictive value of plasma NGAL varied according to the AKI definition used and was higher for more severe AKI (increase in creatinine >50%: mean AUC–ROC 0.79 ± 0.01)... P = 0.001." (Explicit use of AUC-ROC as a diagnostic accuracy measure.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.

3	Yes	Introduction describes NGAL's role in AKI diagnosis and its clinical utility in cardiac surgery: "NGAL was found to be an excellent biomarker for the early diagnosis of AKI in children undergoing cardiac surgery... with AUC–ROC >0.9."
4	Yes	Objectives stated: "assessed the value of postoperative plasma NGAL in predicting AKI according to the degree of severity used for its definition."
5	Yes	"In a prospective study of 100 adult cardiac surgery patients..." (Explicitly states prospective design.)
6	Yes	Exclusion criteria listed: "excluded patients undergoing emergency operation... advanced chronic kidney disease... kidney transplant patients..."
7	Yes	Participants identified based on cardiac surgery requiring cardiopulmonary bypass and preoperative criteria (e.g., creatinine levels).
8	No	No explicit mention of dates or specific location beyond "tertiary hospital."
9	No	No description of whether participants were consecutive, random, or convenience-based.
10a	Yes	Plasma NGAL measurement details: "measured by TriageMeter... centrifuged... stored at −80°C."
10b	Yes	Reference standard defined as serum creatinine changes (>25% or >50%) and RIFLE/AKIN criteria.
11	No	No rationale provided for choosing RIFLE/AKIN over other AKI definitions.
12a	Yes	Predefined AKI cut-offs: "sustained (>2 days) increases in serum creatinine... >25% and >50%."
12b	Yes	RIFLE and AKIN classifications used as reference standards with predefined criteria (Table 1).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"AUC–ROC analysis... compared by paired student t-test and ANOVA."
15	No	No mention of handling indeterminate test results.
16	No	No description of missing data handling.
17	Yes	Variability analysis: "AUC–ROC R: 0.72, I: 0.79, F: 0.80... P = 0.015."
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram.
20	Yes	Table 2 provides baseline demographics and clinical characteristics.
21a	Yes	AKI severity distribution analyzed via RIFLE/AKIN classes (Results section).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No time interval details between NGAL measurement and creatinine assessment.
23	No	No cross-tabulation (2x2 table) of index vs. reference standard results.
24	Yes	"AUC–ROC 0.79 ± 0.01... 95% confidence intervals implied via statistical comparisons."
25	No	No adverse events reported.
26	Yes	Limitations discussed: "small sample size... single-centre design... generalisability."
27	Yes	Conclusions highlight NGAL's clinical implications: "needs to be taken into account... future studies."
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.

30	No	Funding sources not explicitly stated in the provided text.

Zhang 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The performance of PCT concentrations in predicting the occurrence of AKI was evaluated by the area under the receiver operating characteristic curve (AUROC)." (Explicitly uses AUC and sensitivity/specificity as diagnostic accuracy measures.)
2	Yes	The abstract includes structured sections: Introduction, Methods, Results, and Conclusions, aligning with STARD for Abstracts guidance.
3	Yes	"Early identification of patients at high risk of AKI is very important... PCT, a quick-response biomarker of inflammation, is readily available in most hospitals." (Describes clinical role and intended use of PCT.)
4	Yes	"We hypothesize that PCT may be helpful in predicting AKI caused by wasp stings." (States study hypothesis and objective.)
5	Yes	"This was a prospective observational study." (Data collection planned before index test and reference standard.)
6	Yes	Exclusion criteria: age <18, pre-existing CKD/AKI, refusal to participate. Inclusion criteria: adult wasp sting patients admitted to two hospitals.
7	Yes	"All adult wasp sting patients admitted to the two hospitals... were screened for enrollment." (Participants identified based on symptoms [wasp stings].)
8	Yes	"Two tertiary hospitals... from January 2017 to December 2020." (Specifies setting, location, and dates.)
9	No	No explicit mention of consecutive, random, or convenience sampling. Described as "prospective observational study" without further details.
10a	Yes	"Blood samples were collected upon admission for laboratory tests, including PCT." (Details on index test methodology.)
10b	Yes	"AKI is defined by KDIGO guidelines... serum creatinine and urine output criteria." (Reference standard clearly defined.)
11	No	No rationale provided for choosing KDIGO over alternative AKI definitions (e.g., RIFLE, AKIN).
12a	No	PCT cutoff (0.57 µg/L) was determined post hoc using the Youden index; no pre-specified threshold.
12b	Yes	KDIGO criteria for AKI staging were pre-specified and applied uniformly.
13a	No	No information on whether clinicians assessing PCT were blinded to AKI status or clinical data.
13b	No	No information on whether AKI assessors were blinded to PCT results.
14	Yes	"Logistic regression model... ROC curves... Youden index." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate PCT or AKI results (e.g., missing creatinine values).
16	No	No description of methods to address missing data (e.g., PCT or AKI outcomes).
17	No	No analysis of variability in diagnostic accuracy across subgroups or pre-specified analyses.
18	No	No justification for sample size (n=138) or power calculation provided.
19	No	No participant flow diagram; only textual description of exclusions (e.g., 9 patients excluded).
20	Yes	Table 1 summarizes demographic and clinical characteristics (age, sex, comorbidities, etc.).

21a	Yes	AKI severity distribution: 21 stage 1, 5 stage 2, 40 stage 3 (Table 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients reported.
22	No	No discussion of time intervals between PCT measurement and AKI diagnosis or interventions affecting results.
23	No	No 2x2 contingency table of PCT vs. AKI results; only AUROC and sensitivity/specificity provided.
24	Yes	"AUROC of PCT was 0.837 (95% CI: 0.771–0.902)... sensitivity 73.43%, specificity 79.45%." (Accuracy estimates with precision.)
25	No	No adverse events related to PCT testing or AKI assessment reported.
26	Yes	"Study limitations... single-center, small sample size, lack of external validation." (Explicitly addresses limitations.)
27	Yes	"Serum PCT levels may be a potential biomarker of AKI in patients stung by wasps." (Clinical implications stated.)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	No	Funding sources and roles of funders not disclosed in the provided text.

Salmito 2024

Item No.	Assessment	Support for Assessment
1	Yes	"Logistic regression models, receiver operating characteristic (ROC) curves, continuous net reclassification improvement (NRI) and integrated discrimination improvement (IDI) were used for analysis." (Explicit use of accuracy measures like AUC, NRI, and IDI.)
2	Yes	Structured abstract with sections: background, methods, results, conclusions. Example: "This study aimed to analyze... Methods: A prospective observational study... Results: Among the patients... Conclusions: AGPT2 and syndecan-1 demonstrated predictive value..."
3	Yes	"Scientific and clinical background" provided in the introduction, including AKI's clinical role and the need for biomarkers to predict KST. Example: "predicting the need for KST in critically ill patients remains challenging... intended use of biomarkers."
4	Yes	Objectives stated: "This study aimed to analyze endothelium-related biomarkers as predictors of KST need..." Hypotheses implied in the analysis of biomarker performance.
5	Yes	"A prospective observational study was conducted..." (Explicitly states prospective design.)
6	Yes	Inclusion/exclusion criteria detailed: age ≥18, stage 2 AKI by sCr, exclusions (e.g., CKD, metabolic complications).
7	Yes	Basis for eligibility: "patients admitted to the ICU... screened for the development of stage 2 AKI as defined by serum creatinine."
8	Yes	"Hospital unit... trauma reference... five adult ICUs... between November 2021 and November 2022." (Setting, location, dates specified.)
9	No	No explicit mention of consecutive, random, or convenience sampling. Flow diagram (Fig. 1) suggests convenience sampling but lacks confirmation.
10a	Yes	Index test (biomarkers) described in detail: "ELISA kits, intra-assay coefficients of variation." Replicable methodology.
10b	Yes	Reference standard (KST initiation) defined: "initiated by attending nephrologist" based on institutional criteria (e.g., hyperkalemia, acidosis).
11	No	No rationale provided for using KST as the reference standard (clinical decision assumed, but alternatives not discussed).

12a	No	Biomarker cut-offs derived from ROC analysis (exploratory) without pre-specified thresholds. Example: "cut-off values" not predefined.
12b	No	Timeframe for KST (72h) used as a binary outcome but no rationale provided for this cut-off.
13a	No	Biomarker measurements (index test) were likely blinded to clinical outcomes, as they were collected prospectively. No explicit statement.
13b	No	Clinicians deciding KST used standard criteria; no mention of access to biomarker results (research data).
14	Yes	Methods for accuracy: "ROC curves, DeLong's method, NRI, IDI."
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	Missing data handling not discussed (e.g., excluded patients in Fig. 1 but no details on missing measurements).
17	No	No analysis of variability in accuracy across subgroups or conditions.
18	No	No sample size justification or power calculation provided.
19	Yes	Participant flow diagram (Fig. 1) included.
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	Severity distribution (e.g., AKI stage 3) in KST patients not analyzed.
21b	No	Alternative diagnoses in non-KST patients not discussed (all had AKI).
22	Yes	Time interval specified: "KST initiation up to 72h after inclusion."
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	Accuracy estimates with 95% CIs: "AUC-ROC for AGPT2 and syndecan-1... improved discrimination capacity."
25	No	No adverse events reported from biomarker testing or KST.
26	Yes	Limitations discussed: single-center, small sample, selection bias.
27	Yes	Implications for practice: "early identification of patients who will benefit from KST."
28	No	No trial registration number provided.
29	No	No mention of study protocol availability.
30	No	Funding sources not explicitly stated in the provided text.

Sampaio de souza garms 2021

Item No.	Assessment	Support for Assessment
1	Yes	"Diagnostic characteristics... were assessed by the calculation of the area under the receiver operating characteristic curve (AUCROC)." (Uses AUC as a measure of accuracy.)
2	Yes	Structured abstract includes "Introduction," "Objective," "Methods," "Results," and "Conclusion."
3	Yes	Background discusses vancomycin nephrotoxicity, limitations of creatinine, and aims of urinary biomarkers.
4	Yes	"The aim of this study was to evaluate the role of urinary IL-18... as diagnostic and prognostic predictors."

5	Yes	"A prospective cohort study... from July 2019 to May 2020."
6	Yes	Inclusion/exclusion criteria: age ≥18, exclusion of CKD stage 5, hemodynamic instability, etc.
7	Yes	"Patients receiving vancomycin and admitted to wards... identified based on vancomycin use."
8	Yes	"Admitted to wards of a public university hospital from July 2019 to May 2020."
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	Detailed methods for biomarker measurement: "LUMINEX-xMAP technology... analyzed every 48–72 h."
10b	Yes	Reference standard: KDIGO criteria for AKI.
11	No	No rationale provided for choosing KDIGO over other AKI definitions.
12a	No	Biomarker cut-offs (e.g., NephroCheck® >0.3) mentioned but not pre-specified as exploratory.
12b	Yes	KDIGO criteria for AKI positivity are predefined.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Logistic regression" and "AUCROC analysis" for accuracy estimation.
15	No	No description of handling indeterminate test results.
16	No	No mention of missing data handling.
17	No	No variability analyses (e.g., subgroup or sensitivity analyses).
18	No	No intended sample size calculation or justification.
19	Yes	Figure 1: Flow diagram of participant inclusion.
20	Yes	Table 1: Baseline demographics and clinical characteristics.
21a	No	Severity distribution (e.g., KDIGO stages) mentioned but not analyzed by biomarker performance.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (biomarkers) and reference standard (AKI diagnosis) not specified.
23	No	No cross-tabulation (2x2 table) of biomarker results vs. KDIGO outcomes.
24	No	AUC reported but without 95% confidence intervals (e.g., "AUCROC analysis...").
25	No	No adverse events from biomarker testing or vancomycin use reported.
26	Yes	"Study limitations... small sample size and single-center design."
27	Yes	"Implications for practice... urinary biomarkers may aid early AKI detection."
28	No	No registration number or registry name provided.
29	No	No protocol accessibility statement.
30	No	Funding sources not declared in the manuscript.

Oezkur 2017

Item No.	Assessment	Support for Assessment
1	Yes	The study reports sensitivity (0.60), specificity (0.88), odds ratios, and C-statistics (AUC=0.74), indicating diagnostic accuracy evaluation.
2	Yes	The abstract includes structured sections: Background/Aims, Methods, Results, and Conclusions.
3	Yes	The introduction describes AKI's clinical impact, limitations of current biomarkers, and the intended role of Nephrocheck® for early AKI prediction.
4	Yes	Objectives are stated: "investigate the predictive value of [TIMP-2*IGFBP7] at various time points."
5	Yes	Methods state: "prospective cohort study," confirming prospective data collection.
6	Yes	Inclusion/exclusion criteria detailed: elective cardiac surgery patients, excluding advanced CKD, infections, etc.
7	Yes	Participants identified based on undergoing specific cardiac surgeries (CABG, valve surgery, etc.).
8	Yes	Setting: University Hospital Würzburg; dates: April–December 2014 (Results section).
9	No	No explicit mention of consecutive, random, or convenience sampling; likely convenience.
10a	Yes	Index test (Nephrocheck®) described: urinary [TIMP-2*IGFBP7] measured via fluorescence immunoassay, processed within 2 hours.
10b	Yes	Reference standard: KDIGO criteria (SCr rise >0.3 mg/dl within 48h or urine output criteria).
11	No	Rationale for KDIGO as reference standard implied but not explicitly stated.
12a	Yes	Pre-specified cut-off ≥0.3 (manufacturer's recommendation).
12b	Yes	KDIGO criteria (pre-specified SCr thresholds).
13a	No	Medical staff blinded to index test results; no confirmation of whether clinical data were available to test performers.
13b	No	No explicit statement on whether clinical data influenced reference standard assessment.
14	Yes	Methods include logistic regression, ROC curves, C-statistics, sensitivity, specificity, PPV/NPV.
15	No	No discussion of handling indeterminate results for index or reference tests.
16	Yes	Missing ICU admission values imputed with 24h data if no AKI occurred (Statistical Methods).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses or pre-specified vs. exploratory).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram; textual description only.
20	Yes	Tables 2 and 3 report baseline demographics and clinical characteristics.
21a	Yes	AKI severity distribution (stages 1–3) reported in Results.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time interval defined: index test at ICU admission, reference standard within 48h post-surgery.
23	No	No cross-tabulation (2x2 table) of index vs. reference results; only ORs and proportions.
24	Yes	C-statistic with 95% CI reported (0.74; multivariate model).
25	No	No mention of adverse events from index or reference tests.
26	Yes	Limitations discussed: single-center design, missing data, sample size.

27	Yes	Conclusion states clinical implications for early AKI prediction and prevention.
28	No	No trial registration number provided.
29	No	No statement on full protocol availability.
30	No	Funding sources not explicitly mentioned; only publisher's copyright notice.

Meersch 2014

Item No.	Assessment	Support for Assessment
1	Yes	"The maximum urinary [TIMP-2]*[IGFBP7] concentration... demonstrated an area under the receiver-operating characteristic curve of 0.84. Sensitivity was 0.92, and specificity was 0.81." (Explicit reporting of AUC, sensitivity, and specificity.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions. Adheres to STARD for Abstracts guidance.
3	Yes	Introduction describes AKI's clinical burden, limitations of current biomarkers, and the role of [TIMP-2]*[IGFBP7] as a prognostic tool.
4	Yes	"We tested the hypothesis that urinary [TIMP-2]*[IGFBP7]... could predict AKI in cardiac surgery patients... and predict renal recovery." (Explicit objectives and hypotheses.)
5	Yes	"All patients were prospectively followed from enrollment." (Prospective data collection planned before index/reference tests.)
6	Yes	Inclusion: Cleveland Clinic Score ≥6; exclusion: pregnancy, immunosuppression, etc. (Eligibility criteria listed in Methods.)
7	Yes	Patients identified based on preoperative risk score (Cleveland Clinic Score) and cardiac surgery setting.
8	Yes	"University of Münster Cardiac Surgery service... between June 2013 and September 2013." (Setting, location, and dates specified.)
9	No	No explicit mention of consecutive, random, or convenience sampling. Flow diagram suggests consecutive enrollment but not stated.
10a	Yes	"Urine samples were analyzed for [TIMP-2]*[IGFBP7] using NephroCheckTM Test... 100 µl urine, 20-minute bedside analysis." (Replicable index test details.)
10b	Yes	Reference standard: KDIGO criteria (serum creatinine/urine output). "AKI status was classified... based on serum creatinine and urine output."
11	No	Rationale for KDIGO as reference standard not explicitly discussed (e.g., alternatives not mentioned).
12a	No	Cutoff of 0.50 used, but no rationale provided for prespecification. Statistical analysis states "selected thresholds" (suggests exploratory).
12b	Yes	KDIGO criteria are predefined international guidelines (prespecified cutoffs for AKI staging).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curves... AUC... sensitivity, specificity, PPV, NPV reported." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No discussion of missing data handling for index/reference tests.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroups or pre-specified vs. exploratory).

18	Yes	"Sample size of 26 patients per group... power calculation based on prior effect size (nQuery Advisor)."
19	Yes	"Figure 1: CONSORT 2010 Flow Diagram" provided (participant flow diagram).
20	Yes	Table of baseline demographics/clinical characteristics (age, comorbidities, etc.) in Results.
21a	No	No distribution of disease severity (e.g., AKI stages) in those with AKI.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (post-CPB) and reference standard (days later) not explicitly addressed.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC of 0.84 (95% CI)... sensitivity, specificity, and 95% CIs reported."
25	No	No adverse events from index/reference tests mentioned.
26	Yes	Limitations: small sample size, single-center design, lack of protocolized interventions.
27	Yes	"Urinary [TIMP-2]*[IGFBP7] serves as a sensitive and specific biomarker... for interventions." (Clinical implications stated.)
28	Yes	"DRKS-ID: DRKS00005062" (Registration number and registry provided).
29	No	No statement on accessing the full study protocol.
30	Yes	"Funded by German Research Foundation... role of funders declared." (Funding sources disclosed.)

Katagiri 2012

Item No.	Assessment	Support for Assessment
1	Yes	"receiver operating characteristic (ROC) analysis revealed that the biomarkers' performance was statistically significant... AUC-ROC 0.81" (explicit use of diagnostic accuracy measures).
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background explains AKI's clinical significance, limitations of serum creatinine, and the potential role of urinary biomarkers.
4	Yes	"This study was undertaken to evaluate a biomarker panel... to establish a more useful diagnostic tool" (clear objectives).
5	Yes	"This study prospectively evaluated 77 adult patients" (explicitly states prospective design).
6	Yes	Exclusion criteria: "end-stage renal disease or renal transplant" (eligibility criteria listed).
7	Yes	Participants identified based on undergoing "scheduled cardiac surgery" (clinical context).
8	No	Mentions "2 general hospitals" but lacks specific dates or detailed setting descriptions.
9	No	No mention of consecutive, random, or convenience sampling in enrollment.
10a	Yes	Detailed methods for urinary L-FABP and NAG measurement, including assay protocols and time points.
10b	Yes	AKI defined by AKIN criteria (reference standard clearly described).
11	Yes	Rationale for AKIN criteria: "serum creatinine... limitations... development of new biomarkers has been emphasized."

12a	No	Cut-offs for biomarkers determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	AKIN criteria use pre-specified cut-offs (≥0.3 mg/dL or ≥50% increase in creatinine).
13a	No	No information on whether clinical data/reference results were available to index test assessors.
13b	No	No information on whether biomarker results were available to reference standard assessors.
14	Yes	"ROC curve analysis," "sensitivity," "specificity," and statistical methods for comparisons described.
15	No	No discussion of handling indeterminate biomarker or reference standard results.
16	No	No mention of missing data handling for biomarkers or creatinine.
17	Yes	"differences in ROC curves were tested using a nonparametric method" (analysis of variability).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram included.
20	Yes	Table 1 summarizes baseline demographics and clinical characteristics.
21a	No	No stratification of AKI severity (e.g., AKIN stages) in results.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	No	Timing between index test (biomarkers) and reference standard (creatinine) not explicitly addressed.
23	No	No 2x2 contingency table of biomarker results vs. AKIN diagnosis.
24	Yes	AUCs with 95% confidence intervals reported (e.g., "AUC-ROC 0.81 [95% CI, 0.68 to 0.89]").
25	No	No adverse events related to biomarker testing mentioned.
26	Yes	Limitations discussed: small sample size, heterogeneous population, and generalizability.
27	Yes	"Combining 2 markers... presents a reasonable strategy to improve diagnostic performance" (implications for practice).
28	No	No trial registration number provided.
29	No	No statement on protocol availability.
30	Yes	"CMIC Co. Ltd" provided L-FABP assay kits; role of funders not explicitly discussed.

Thanakitcharu 2014 Here is the extracted table in Markdown format:

Item No.	Assessment	Support for Assessment
1	Yes	"A prospective, diagnostic test study... Estimates of diagnostic accuracy (sensitivity, specificity, AUC) are reported in Results (e.g., 'sensitivity and specificity of 72% and 60%')."
2	Yes	The abstract provides a structured summary of objectives, methods (prospective design, sample size), results (cut-off, accuracy), and conclusions.
3	Yes	Background section explains AKI diagnosis limitations and the clinical role of NGAL as an early biomarker.
4	Yes	"Objective: The present study aimed to determine the cut-off level of UNGAL... and to determine the risk factors."

5	Yes	"A prospective, diagnostic test study was conducted..." Data collection was planned prospectively.
6	Yes	Inclusion/exclusion criteria listed under "Patients" section (e.g., age >18, CPB use, exclusion of preexisting renal dysfunction).
7	No	No explicit description of how potentially eligible participants were identified (e.g., via symptoms, registries). Only states "consecutively recruited."
8	Yes	"Rajavithi Hospital (Bangkok, Thailand)... over a period of 6 months (June to November 2010)."
9	Yes	"Adult cardiac surgical patients were consecutively recruited."
10a	Yes	Index test described in detail: "UNGAL was measured with the ARCHITECT NGAL assay... at 0, 3, and 6 hours after surgery."
10b	Yes	Reference standard defined: "AKI was defined as an increment in serum creatinine of >0.3 mg/dl within 48 hours (AKIN criteria)."
11	No	No rationale provided for choosing AKIN criteria over other AKI definitions (e.g., RIFLE, KDIGO).
12a	No	The NGAL cut-off (>11.3 ng/ml) was derived post hoc via ROC analysis (exploratory), not pre-specified.
12b	Yes	AKIN criteria's cut-off (>0.3 mg/dl) was pre-specified and referenced.
13a	No	No information on whether reference standard results were blinded to NGAL test performers.
13b	No	No information on whether NGAL results were blinded to reference standard assessors.
14	Yes	"Diagnostic value... analyzed using ROC curve, AUC-ROC, sensitivity, specificity."
15	No	No mention of handling indeterminate NGAL or serum creatinine results.
16	No	No description of missing data handling for NGAL or serum creatinine.
17	No	No analysis of variability in diagnostic accuracy across subgroups.
18	Yes	Sample size calculation described: "Sample size estimation... required 130 subjects."
19	No	No participant flow diagram; only textual description in Results.
20	Yes	Table 1 details baseline demographics and clinical characteristics.
21a	No	AKI severity distribution (e.g., AKIN stages) not reported.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals specified: NGAL measured at 0, 3, 6 hrs; serum creatinine monitored for 48 hrs.
23	No	No 2x2 contingency table cross-tabulating NGAL results against AKIN outcomes.
24	Yes	"AUC-ROC of 0.69 (95% CI 0.60-0.79)" with sensitivity/specificity reported.
25	No	No mention of adverse events from NGAL testing or serum creatinine monitoring.
26	Yes	Limitations discussed: single-center, small sample, no long-term outcomes.
27	Yes	"UNGAL level may be a useful marker for predicting AKI..." implies clinical utility.
28	No	No registration number or registry name provided.
29	No	No statement about protocol accessibility.
30	No	Funding sources and role of funders not declared.

Adler 2018

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity was 96.8% and specificity was 94.1%." (Explicitly reports sensitivity and specificity as measures of diagnostic accuracy.)
2	Yes	Structured abstract includes "Background", "Methods", "Results", and "Conclusions" sections.
3	Yes	"The present study aimed to determine the diagnostic utility [...] for the early recognition of AKI in patients with non-traumatic shock." (Describes clinical role of the index test.)
4	Yes	"The objective was the evaluation of the diagnostic utility [...] for the early recognition of AKI." (States study objective.)
5	Yes	"The performance of [TIMP-2]·[IGFBP7] was prospectively analysed." (Prospective data collection.)
6	Yes	Inclusion criteria: "Adults (≥18 years) [...] OHCA, ROSC, GCS ≤8 [...]"; exclusion criteria: pregnancy, chronic dialysis, ECMO, death within 24h."
7	Yes	"Patients with non-traumatic OHCA [...] were consecutively enrolled." (Basis: OHCA diagnosis.)
8	Yes	"Admitted to the cardiac ICU of the University Hospital of Cologne between May 2014 and January 2016." (Setting and dates specified.)
9	Yes	"Seventy-five consecutive patients [...] were admitted [...] Forty-eight patients [...] were analysed." (Consecutive series.)
10a	Yes	"Urinary [TIMP-2]·[IGFBP7] samples were collected [...] measured with the NephroCheck™ point-of-care test [...]." (Detailed index test methodology.)
10b	Yes	"AKI was classified according to KDIGO guidelines [...] defined as increase in serum creatinine or reduced urine secretion." (Reference standard clearly defined.)
11	No	No explicit rationale provided for choosing KDIGO guidelines over other reference standards.
12a	No	"Optimal [TIMP-2]·[IGFBP7] cut-off [...] was determined by ROC analysis." (Cut-off derived post hoc, not pre-specified.)
12b	Yes	KDIGO criteria are pre-defined and widely accepted (no exploration mentioned).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC analysis [...] AUC was 0.97 [...] sensitivity and specificity calculated." (Methods for accuracy measures described.)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	Exclusion criteria described, but no explicit methods for handling missing data.
17	No	No analyses of variability in diagnostic accuracy reported.
18	No	No sample size calculation or justification provided.
19	Yes	"Fig. 1" illustrates participant flow.
20	Yes	"Baseline characteristics" table includes demographics and clinical data.
21a	No	Severity distribution of AKI (e.g., KDIGO stages) not detailed in results.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	"Urine samples [...] collected at 3 and 24 h [...] AKI developed after 26 ± 12 h." (Time interval specified.)
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.

24	Yes	"AUC 0.97 (CI 0.90–1.00) [...] sensitivity 96.8%, specificity 94.1%." (Accuracy estimates with precision.)
25	No	No adverse events from index or reference tests reported.
26	Yes	"Study limitations [...] small sample size, single-center design [...]." (Limitations discussed.)
27	Yes	"This novel test may help identify high-risk patients [...] for clinical studies." (Implications for practice stated.)
28	No	No registration number or registry name provided.
29	No	No mention of where the full study protocol can be accessed.
30	Yes	"Sources of funding [...] Creative Commons license [...]." (Funding and license disclosed.)

Mosa 2018

Item No.	Assessment	Support for Assessment
1	Yes	"ROC curve analysis for all measured biomarkers after 2 h of CPB showed that serum NGAL (0.819, > 75% cutoff, 83.5% accuracy)... serum creatinine (0.864, > 140% cutoff, 85% accuracy)" (Abstract). Explicitly reports AUC, sensitivity, specificity, and accuracy measures.
2	Yes	Abstract includes structured sections: Background, Objective, Results, Conclusions.
3	Yes	Introduction describes AKI's clinical significance, limitations of creatinine, and the intended role of NGAL/troponin I as early biomarkers (e.g., "The best way to screen for AKI is in the earlier period... for therapeutic intervention relying on novel biomarkers").
4	Yes	Objective states: "We aimed to evaluate the predictive performance of both NGAL and Klotho for AKI..." (Abstract).
5	No	No explicit statement on whether data collection was prospective or retrospective. Methods mention sample collection timing but not study design.
6	Yes	"Inclusion criteria were age ≤80 years, controlled diabetic patients... exclusion criteria were patients with diabetic nephropathy, cardiorenal syndrome..." (Methods).
7	No	Eligibility criteria are listed, but no details on how participants were identified (e.g., symptoms, prior tests).
8	No	Mentions "Egyptian ICU patients" but lacks specific dates, locations, or settings beyond "ICU after open heart surgery."
9	No	No description of whether participants were consecutive, random, or convenience-based.
10a	Yes	Index tests (NGAL, troponin I) are described with assay methods: "Beckman Coulter UniCel DxI 800 Immunoassay Analyzer... ELISA kits" (Methods).
10b	Yes	Reference standard: "KDIGO criteria relying on serum creatinine levels" (Abstract), with creatinine measurement details (BioAssay QuantiChromTM Kit).
11	No	No rationale provided for choosing KDIGO/creatinine as the reference standard over alternatives.
12a	No	Cutoffs (e.g., NGAL >75%) are mentioned in ROC analysis but not pre-specified; thresholds appear exploratory.
12b	Yes	KDIGO criteria define AKI stages based on creatinine changes, though rationale for thresholds is implied, not explicit.
13a	No	Unclear if reference standard results (creatinine) were available to NGAL/troponin I assessors.
13b	No	No information on whether index test results influenced reference standard assessment.

14	Yes	"ROC curve analysis... sensitivity, specificity, accuracy... multivariate analysis" (Abstract, Results).
15	No	No description of handling indeterminate/missing test results.
16	No	No mention of missing data handling.
17	No	Variability analyses (e.g., subgroup comparisons) are performed but not distinguished as pre-specified or exploratory.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Table 1 details demographics, clinical characteristics (e.g., age, eGFR, comorbidities).
21a	No	No distribution of disease severity in AKI patients (e.g., KDIGO stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (NGAL/troponin I) and reference standard (creatinine) not specified.
23	Yes	Cross-tabulation implied by ROC metrics (sensitivity/specificity) but no explicit 2x2 table.
24	Yes	"AUC 0.819... 83.5% accuracy" with confidence intervals missing but precision implied via p-values (Results).
25	No	No adverse events reported from NGAL/troponin I testing.
26	Yes	Limitations: "diagnostic utility [of troponin I] is restricted due to age-dependent cutoff values and poor standardization" (Abstract).
27	Yes	Conclusions state NGAL's role as a "prognostic tool" and "sensitive marker," with implications for practice.
28	No	No registration number or registry name.
29	No	No protocol accessibility statement.
30	No	Mentions commercial kits (e.g., Roche Hitachi, Elabscience) but no funding sources or sponsor roles.

Orhon ergun 2022

Item No.	Assessment	Support for Assessment
1	Yes	"At 6 h, a plasma NGAL level greater than 71.8 ng/mL has a sensitivity and specificity of 85% and 81% in predicting subsequent AKI development." (Explicitly reports sensitivity and specificity.)
2	Yes	Abstract includes structured sections: Background, Aim, Methods, Results, Conclusions.
3	Yes	"The intended use and clinical role of the index test" are described in the Introduction: NGAL as an early marker for AKI to enable early diagnosis.
4	Yes	"This study aimed to examine the potential utility of plasma neutrophil gelatinase associated lipocalin levels in early prediction of AKI..." (Explicit objective).
5	Yes	"This prospective single-center cohort study..." (Data collection planned prospectively).
6	Yes	Inclusion/exclusion criteria listed under "Patients" section.
7	Yes	"Patients were identified based on undergoing major oncologic surgery with laparotomy (≥65 years)."

8	No	No specific dates or detailed setting beyond "Marmara University Pendik Training and Research Hospital."
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	NGAL measurement details: "EDTA plasma samples, ELISA technique (Bioassay Technology Laboratory kit)."
10b	Yes	Reference standard: AKI defined by creatinine increase ≥0.3 mg/dL or ≥1.5× baseline within 48h (KDIGO criteria).
11	Yes	"Acute kidney injury was defined as... [33]" (Rationale for reference standard cited).
12a	No	Cut-off (71.8 ng/mL) derived post hoc from ROC analysis; not pre-specified.
12b	Yes	AKI criteria were pre-specified using established guidelines.
13a	No	No information on whether NGAL assessors were blinded to clinical data or reference standard.
13b	No	No information on whether AKI assessors were blinded to NGAL results.
14	Yes	"ROC curves were drawn... area under curve calculated."
15	No	No mention of handling indeterminate NGAL or AKI results.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	"Sample size... estimated based on a previous study [31] (n=45 targeted; 60 enrolled)."
19	No	No participant flow diagram; described textually only.
20	Yes	Tables 1 and 2 describe baseline demographics and clinical characteristics.
21a	No	Severity distribution of AKI (e.g., KDIGO stages) not reported.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	"Time interval" defined: NGAL measured pre-op, 6h, 24h; AKI assessed at 48h.
23	No	No 2x2 table cross-tabulating NGAL results against AKI diagnosis.
24	No	Sensitivity/specificity reported without 95% confidence intervals.
25	No	No adverse events reported from NGAL testing or AKI assessment.
26	Yes	Limitations: single-center design, small sample size, need for confirmatory studies.
27	Yes	"Implication statement" discusses clinical role of NGAL for early diagnosis.
28	Yes	"Trial registration: ClinicalTrials.gov (NCT05030727)."
29	No	No statement on full protocol accessibility.
30	No	No funding sources or conflicts of interest disclosed in the provided text.

Sahu 2022

Item No.	Assessment	Support for Assessment

1	Yes	"At a cutoff of 256.5 ng/mL, plasma NGAL had a sensitivity of 68% and a specificity of 95.2% (area under the curve = 0.878; P < 0.0001; 95% CI: 0.801–0.955)" (Abstract). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Introduction, Methods, Results, Conclusions. Provides design, methods, results, and conclusions concisely.
3	Yes	Introduction describes CIN as a clinical problem and NGAL's role as an early biomarker. States NGAL's intended use for predicting CIN post-PCI (Abstract and Introduction).
4	Yes	Objectives stated: "assess the incidence of CIN [...] identify factors predictive of CIN [...] assess the predictive cutoff value of NGAL" (Introduction).
5	Yes	"Prospective observational study" (Methods). Data collection planned before index test (NGAL) and reference standard (creatinine).
6	Yes	Inclusion: "212 consecutive 'all-comer' patients undergoing PCI." Exclusion: CABG within 1 month, active infection, malignancy (Methods).
7	Yes	Participants identified based on undergoing PCI ("all-comer" patients scheduled for PCI; Methods).
8	Yes	"Single-center [...] Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow [...] March 2015 to April 2016" (Methods).
9	Yes	"212 consecutive 'all-comer' patients" (Methods). Consecutive series explicitly stated.
10a	Yes	"Plasma NGAL levels were measured at 4 hours post-PCI using Triage® AlereTM ELISA" (Methods). Sufficient detail for replication.
10b	Yes	Reference standard: CIN defined as serum creatinine increase >0.5 mg/dL or >25% at 48 hours (Methods). Uses established criteria.
11	Yes	Rationale: "Creatinine [...] is presently the gold standard for defining CIN" (Introduction). Acknowledges limitations but justifies use.
12a	No	Cutoff of 256.5 ng/mL derived post-hoc via ROC curve and Youden index (Results). No mention of pre-specified thresholds.
12b	Yes	CIN definition (creatinine criteria) is pre-specified and based on European Society of Urogenital Radiology guidelines (Methods).
13a	No	No mention of blinding. NGAL testers likely unaware of reference standard results, but not explicitly stated.
13b	No	No mention of blinding. Creatinine assessors likely unaware of NGAL results, but not explicitly stated.
14	Yes	"Sensitivity, specificity, AUC, 95% CI" calculated (Results). Statistical methods described (logistic regression, ROC analysis).
15	No	No discussion of indeterminate/missing NGAL or creatinine results.
16	No	No description of missing data handling (e.g., exclusion, imputation).
17	No	No analysis of variability in accuracy measures (e.g., subgroups, reader variability).
18	No	No sample size justification or power calculation mentioned.
19	No	No participant flow diagram. Text describes recruitment but lacks visual summary.
20	Yes	Table 1 provides baseline demographics, clinical characteristics, and lab parameters.
21a	No	Severity of CIN (e.g., AKI stages) not reported; only presence/absence of CIN.
21b	No	No distribution of alternative diagnoses in non-CIN patients (e.g., other causes of AKI).
22	Yes	"Plasma NGAL [...] at 4 hours post-PCI" vs. creatinine "at 48 hours post-PCI" (Methods). Time interval specified.
23	No	Sensitivity/specificity reported, but no 2x2 table cross-tabulating NGAL results against CIN status.
24	Yes	"Sensitivity 68%, specificity 95.2%, AUC 0.878 (95% CI: 0.801–0.955)" (Abstract). Precision metrics included.
25	No	No adverse events from NGAL testing or contrast administration reported.
26	Yes	Limitations: Single-center design, lack of long-term outcomes, and unassessed biomarkers (Discussion).

27	Yes	"Plasma NGAL is an early and highly predictive biomarker [...] Implications for high-risk patients" (Conclusions).
28	No	No trial registration number or registry name provided.
29	No	No statement on protocol availability.
30	No	Funding sources not declared. Acknowledgments mention institutional support but no funder role.

Wetz 2015

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analysis was used to determine optimal cutoff points with combined maximized sensitivity and specificity (by Youden index)." (Methods section). The study explicitly uses ROC analysis for diagnostic accuracy evaluation.
2	Yes	The abstract contains structured sections: Introduction, Methods, Results, Conclusion.
3	Yes	"The aim of this study was to clarify the question whether quantification of TIMP-2 and IGFBP-7 is an adequate diagnostic test for detecting AKI after CS involving CPB." (Introduction). Background and intended use are clearly described.
4	Yes	"The aim of this study was to clarify..." (Introduction) and hypotheses are implied through comparison with prior studies (e.g., "Previously published cutoff points... were not confirmed").
5	Yes	"The trial was approved... recruitment period spread from August 2013 to February 2014." (Methods). Prospective data collection is implied.
6	Yes	Inclusion/exclusion criteria detailed: age, surgery type, chronic renal failure, etc. (Methods).
7	Yes	Participants were identified based on undergoing CABG surgery with CPB (Methods: "inclusion criteria").
8	Yes	"Department of Anesthesiology and Intensive Care, University Hospital of Goettingen, Germany... recruitment period spread from August 2013 to February 2014." (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling. Likely convenience series but not stated.
10a	Yes	Detailed description of urine sample collection, processing, and analysis using the NephroCheck test (Methods).
10b	Yes	Reference standard: KDIGO classification criteria for AKI (Methods: "definition and graduation of AKI").
11	No	No rationale provided for choosing KDIGO over alternative standards (e.g., RIFLE or AKIN).
12a	No	Cutoffs (0.3 and 2) were tested but not pre-specified; exploratory analysis used Youden index (Results).
12b	Yes	KDIGO criteria (serum creatinine and urine output thresholds) are pre-specified and defined (Methods).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC analysis... sensitivity, specificity, AUC" (Methods/Results).
15	No	No mention of handling indeterminate results (e.g., missing or ambiguous test values).
16	No	No description of handling missing data (e.g., excluded patient due to death).

17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram included.
20	Yes	Table 1 lists demographic/clinical characteristics (age, BMI, comorbidities).
21a	No	No distribution of disease severity beyond KDIGO staging (e.g., AKI etiology).
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Partial	Time points for index test specified, but no discussion of interventions between tests.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Partial	AUC mentioned but no confidence intervals for accuracy estimates (Results: "AUC, 0.80").
25	No	No adverse events reported from index or reference tests.
26	Yes	Limitations discussed: small sample, cutoff discrepancies, timing differences (Conclusion).
27	Yes	"Can be used as a diagnostic test... on the first postoperative day" (Conclusion).
28	Yes	"DRKS00005457. Registered 26 November 2013." (Abstract/Methods).
29	No	No statement on protocol accessibility.
30	Yes	"Sources of funding... Creative Commons Attribution License" (Funding section).

Chen 2012

Item No.	Assessment	Support for Assessment
1	Yes	"For predicting AKI, serum CysC displayed an excellent areas under the receiver operating characteristic curve (AUROC) (0.895±0.031, p<0.001)." (Explicit use of AUROC as a measure of diagnostic accuracy.)
2	Yes	Abstract includes structured sections: Background, Methodology/Principal Findings, Conclusions.
3	Yes	"The aim of this study was to identify the relationship between AKI/short-term prognosis and AKI biomarkers... including serum and urinary cystatin C (CysC), neutrophil gelatinase-associated lipocalin (NGAL) and interleukin-18 (IL-18)." (Describes clinical role of biomarkers.)
4	Yes	"The aim of this study was to identify the relationship between AKI/short-term prognosis and AKI biomarkers..." (Clear study objective.)
5	Yes	"This investigation was performed... between September 2009 and August 2010. [...] Prospectively collected data..." (Prospective study design.)
6	Yes	"Exclusion criteria were as follows: unable to give written informed consent... pediatric patient... history of end-stage renal failure..." (Detailed eligibility criteria.)
7	Yes	"The causes of CCU admission were AMI in 120 (80%) patients, congestive heart failure in 21 (14%), respiratory failure..." (Basis for participant identification.)
8	Yes	"This investigation was performed in the CCU at a tertiary care referral center in Taiwan between September 2009 and August 2010." (Setting,

		location, and dates specified.)
9	Yes	"Between September 2009 and August 2010, 150 CCU patients... were enrolled." (Consecutive series implied by prospective enrollment.)
10a	Yes	"Serum and urinary CysC and NGAL were measured in duplicate by single ELISA... Serum and urinary IL-18 were measured... according to manufacturer instructions." (Replicable index test details.)
10b	Yes	"Acute kidney injury was defined as in the Acute Kidney Injury Network (AKIN) classification system..." (Reference standard clearly defined.)
11	No	No explicit rationale provided for choosing AKIN criteria over alternative reference standards.
12a	No	Cut-offs determined post hoc using Youden index ("calculated by acquiring the best Youden index"); no pre-specified thresholds.
12b	No	AKIN criteria are predefined, but rationale for choosing specific thresholds (e.g., SCr vs. UO) is not discussed.
13a	No	Unclear whether performers of index tests (biomarker assays) had access to clinical information or reference standard results.
13b	No	Unclear whether assessors of AKIN criteria had access to biomarker results.
14	Yes	"AUROC analysis... sensitivity, specificity, and overall correctness... Hosmer-Lemeshow test... Kaplan-Meier approach." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data handling for biomarkers or AKIN criteria.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	No justification for sample size (n=150) or power calculation.
19	No	No participant flow diagram provided.
20	Yes	"Table 1 lists... baseline demographic and clinical characteristics." (Baseline data reported.)
21a	Yes	"In AKIN classification, 6-month mortality was 3.7%... for stage-0, 23.5%... for stage-3..." (Severity distribution in target condition.)
21b	No	No distribution of alternative diagnoses in non-AKI patients provided.
22	No	Time interval between index test (biomarker measurement) and reference standard (AKIN criteria) not explicitly stated.
23	No	No cross-tabulation (2x2 table) of biomarker results vs. AKIN classification.
24	No	AUROC reported without confidence intervals (e.g., "0.895±0.031" instead of 95% CI).
25	No	No adverse events from biomarker testing or AKIN assessment mentioned.
26	Yes	"Limitations include... single-center design... small sample size... lack of long-term follow-up." (Study limitations discussed.)
27	Yes	"Our data showed that serum CysC... urinary NGAL... are associated with short-term mortality..." (Implications for clinical use.)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	"This work was supported by the National Science Council of Taiwan... The funders had no role in study design..." (Funding sources disclosed.)

Grechukhina 2022

Item No.	Assessment	Support for Assessment
1	Yes	"При построении ROC-кривых установлена высокая чувствительность и специфичность этих мочевых показателей" (ROC curves with sensitivity/specificity reported).
2	Yes	Structured abstract includes "Background, Aim, Materials and Methods, Results, Conclusion".
3	Yes	"Поиск ранних биомаркеров... для сохранения безопасности терапии" (clinical role of biomarkers explained).
4	Yes	"Цель: Определить мочевые биомаркеры..." (clear objective).
5	Yes	Biomarkers measured "до лечения и в течение 8 нед терапии" (prospective data collection).
6	Yes	"В исследование вошли пациенты (n=50), получавшие внутривенные анти-VEGF-препараты" (inclusion criteria specified).
7	Yes	Participants identified based on receiving anti-VEGF therapy ("получавшие внутривенные анти-VEGF-препараты").
8	No	Institutions listed, but no enrollment dates or specific settings described.
9	No	No mention of consecutive, random, or convenience sampling method.
10a	Yes	ELISA kits described with manufacturers (e.g., "Lipocalin-2/NGAL Human ELISA, RD191102200R").
10b	Yes	Reference standard defined as "рСКФ <60 мл/мин" using CKD-EPI formula.
11	No	No explicit rationale for choosing eGFR <60 as the reference standard.
12a	No	ROC-derived cut-offs mentioned, but no pre-specified thresholds (exploratory analysis).
12b	Yes	eGFR <60 is a pre-specified, widely accepted threshold for CKD.
13a	No	No information on blinding of index test assessors to clinical data.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC-кривых... чувствительность и специфичность" (methods for accuracy measures).
15	No	No mention of handling indeterminate results (e.g., missing urine samples).
16	No	No discussion of missing data management.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	Sample size (n=50) stated, but no justification or power calculation provided.
19	No	No participant flow diagram in the abstract or provided text.
20	Yes	"Медиана возраста... пол, возраст, ИМТ" (baseline demographics reported).
21a	Yes	"Распределение... снижение рСКФ" (disease severity in affected group described).
21b	Yes	Comparisons between patients with/without nephrotoxicity (alternative diagnoses).
22	Yes	Biomarkers measured at 1, 2, 4, 8 weeks; eGFR assessed at 8 weeks (timing clarified).
23	No	Sensitivity/specificity reported, but no explicit 2x2 table or distribution.
24	No	No confidence intervals provided for accuracy estimates (e.g., "высокая чувствительность").
25	No	No adverse events related to urine biomarker testing mentioned.

26	No	Limitations section not included in the abstract or provided text.
27	Yes	"Предикторы... раннее повышение NGAL, KIM-1..." (implications for clinical use).
28	No	No trial registration number or registry name provided.
29	No	Ethics approval mentioned, but no protocol accessibility statement.
30	No	Funding sources and roles not declared in the abstract or affiliations.

Wu_tsai 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The prediction of dialysis was good based on the baseline serum creatinine >1.5 mg/dL (72.78% of sensitivity, 86.07% of specificity, 0.851 of area under curve)" (Abstract). Explicitly reports sensitivity/specificity/AUC.
2	Yes	Structured abstract with Background, Methods, Results, Conclusions sections. Matches STARD for Abstracts guidance.
3	Yes	"The clinical role of a test explains its position relative to existing tests... We here aimed to study the association between IV CM from CCT and renal dysfunction" (Background). Describes clinical context of index test (SCr/eGFR).
4	Yes	"We aimed to study...to determine the association between different stages of CKD and renal impairment" (Background). Clear objectives stated.
5	No	No statement about pre-planned data collection. Method states "retrospective historical cohort study" (Methods).
6	Yes	"Exclusion criteria: pre-existing AKI, recent CM exposure, CM volume ≠100mL, missing SCr data" (Methods). Clear eligibility criteria.
7	Yes	"All data were from electronic medical record system...patients who had received intravenous injections" (Methods). Basis of identification described.
8	Yes	"Taichung Veterans General Hospital...1 June 2008 to 31 March 2015" (Methods). Setting/dates specified.
9	No	No description of consecutive/random/convenience sampling. States "retrospective cohort" without recruitment details.
10a	Yes	"Baseline SCr within two days before CCT...eGFR calculated by MDRD formula" (Methods). Index test (SCr/eGFR) sufficiently described.
10b	Yes	Reference standard: KDIGO criteria for CA-AKI ("increase in SCr ≥0.3 mg/dL within 48h or ≥50% within 7 days") (Methods).
11	Yes	"CA-AKI was defined according to KDIGO practice guideline" (Methods). Rationale for reference standard provided.
12a	Yes	"Cutoff value of baseline SCr and eGFR...Youden index" (Methods). Pre-specified positivity criteria with rationale.
12b	Yes	KDIGO criteria thresholds explicitly defined (Methods). Reference standard cutoffs pre-specified.
13a	Unclear	No information on whether reference standard results were available to index test assessors. Assumed blinded but not stated.
13b	Unclear	No information on whether index test results were available to reference standard assessors. Assumed blinded but not stated.
14	Yes	"Sensitivity, specificity, AUC...multivariate logistic regression" (Methods). Statistical methods described.
15	No	No mention of handling indeterminate/missing test results. Methods state exclusion of missing data but no specific protocol.
16	Partial	"Excluded participants...not available post-contrast SCr" (Methods) but no explicit missing data handling method described.

17	No	No analysis of variability in diagnostic accuracy measures reported.
18	No	No sample size calculation or power analysis mentioned.
19	Yes	Figure 1 shows participant flow diagram with exclusions.
20	Yes	Table 1 provides demographic/clinical characteristics by CKD stage.
21a	No	No distribution of disease severity in target condition group (CA-AKI patients).
21b	No	No distribution of alternative diagnoses in non-CA-AKI group.
22	Yes	"Time interval...post-contrast SCr within one week after CCT" (Methods). Specifies testing interval.
23	Yes	Results section reports cross-tabulated accuracy metrics (sensitivity/specificity).
24	Yes	"72.78% sensitivity, 86.07% specificity, 0.851 AUC...95% CI" (Abstract). Precision estimates provided.
25	No	No adverse events from index/reference tests reported.
26	Yes	"Study limitations...retrospective design, single-center data" (Conclusion). Limitations addressed.
27	Yes	"Baseline SCr/eGFR were good predictors...clinical implications for risk stratification" (Conclusion).
28	No	No registration number or registry name provided.
29	No	No statement about protocol accessibility.
30	Yes	"Ethics Committee of Taichung Veterans General Hospital...no funding sources declared" (Methods).

Dusse 2016

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analyses of [TIMP-2]*[IGFBP7] on day one after TAVI reveals a sensitivity of 100 % and a specificity of 90 % for predicting AKI 2/3 (AUC 0.971, 95 % CI 0.914-1.0)" (Explicit reporting of sensitivity, specificity, and AUC).
2	Yes	Structured abstract includes Background, Methods, Results, and Conclusions.
3	Yes	Background section describes AKI as a complication of TAVI and the clinical role of urinary biomarkers for early detection.
4	Yes	"It was the aim of the present study to [...] determine whether this biomarkers are useful in predicting the development of AKI" (Explicit objective).
5	Yes	"prospective observational trial" (Data collection planned before index test and reference standard).
6	Yes	Inclusion: "40 patients with severe symptomatic aortic stenosis [...] undergoing TAVI"; Exclusion: "23 patients excluded due to refusal, incomplete data, etc." (Eligibility criteria described).
7	Yes	"63 consecutive patients were screened" (Participants identified consecutively based on procedure).
8	Yes	"transapical or transaortic TAVI at our institution [...] between January 2014 and September 2014" (Setting, location, and dates specified).
9	Yes	"63 consecutive patients" (Consecutive series).
10a	Yes	"Urinary concentration of TIMP-2 and IGFBP7 were measured with [...] NephroCheck Test [...] twice daily" (Detailed index test methodology).

10b	Yes	"AKI stage [...] according to the KDIGO classification" (Reference standard defined).
11	No	No rationale provided for choosing KDIGO over alternative reference standards.
12a	Yes	"cut-off 1.03 [...] defined by the highest Youden index" (Pre-specified rationale for test positivity cutoff).
12b	Yes	KDIGO criteria for AKI staging are predefined and widely accepted (implied rationale).
13a	Yes	"Physicians in charge were blinded for TIMP-2*IGFBP7 urine concentrations" (Clinical/reference standard information blinded to index test assessors).
13b	Yes	"laboratory investigators were blinded for clinical outcomes" (Index test results blinded to reference standard assessors).
14	Yes	"ROC curve was generated [...] sensitivity, specificity, AUC, and 95 % CI reported" (Methods for estimating accuracy).
15	No	No description of handling indeterminate index test or reference standard results.
16	No	No mention of missing data handling for biomarkers or reference standard.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	"sample size calculation [...] based on prior incidence of AKI and effect size" (Intended sample size justified).
19	Yes	"Fig. 1 CONSORT 2010 Flow diagram" (Participant flow diagram provided).
20	Yes	"Mean patients age was 81.2 ± 5.6 years, 16 patients were male [...]" (Baseline demographics reported).
21a	No	No distribution of disease severity (e.g., AKI stages) in those with the target condition.
21b	No	No distribution of alternative diagnoses in patients without AKI.
22	Yes	Biomarkers measured "within 4 h after surgery and twice daily"; AKI assessed "within 48 h after surgery" (Time interval described).
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC 0.971, 95 % CI 0.914-1.0" (Precision estimates provided).
25	No	No mention of adverse events from biomarker testing or AKI diagnosis.
26	Yes	"Study limitations [...] small sample size [...] single-center design" (Limitations discussed).
27	Yes	"[TIMP-2]*[IGFBP7] provides [...] superior diagnostic accuracy [...] to serum creatinine" (Implications for clinical use stated).
28	No	No registration number or registry name provided.
29	No	No statement on full study protocol accessibility.
30	Yes	"Sources of funding [...] Creative Commons license" (Funding and open-access statement).

Ferguson 2010

Item No.	Assessment	Support for Assessment
1	Yes	"the diagnostic performance of urinary L-FABP for AKI, assessed by the area under the receiver operating characteristic curve, was 0.93" (Abstract). Explicitly reports AUC, a diagnostic accuracy measure.

2	Yes	Abstract includes study design (cross-sectional), methods (western blot, ROC analysis), results (AUC values), and conclusions.
3	Yes	Background discusses AKI's clinical challenges, SCr limitations, and L-FABP's role as a biomarker (Introduction).
4	Yes	"determine the prognostic ability of urinary L-FABP, and further characterize its sensitivity and specificity" (Abstract). Clear objectives.
5	No	Described as a cross-sectional study but no explicit statement on prospective/retrospective data collection.
6	No	Mentions inclusion of AKI patients and controls but lacks detailed eligibility criteria (e.g., age, exclusion factors).
7	No	No description of how participants were identified (e.g., symptoms, prior tests).
8	No	Mentions hospital settings but lacks specific dates or locations beyond institutional names.
9	No	No statement on consecutive, random, or convenience sampling.
10a	Yes	"urinary L-FABP levels normalized to urinary creatinine" (Methods). Sufficient detail for replication.
10b	No	Reference standard defined as clinical confirmation + SCr elevation but lacks operational criteria (e.g., AKIN/RIFLE).
11	No	No rationale provided for choosing clinical/SCr as the reference standard.
12a	No	Cutoffs derived from ROC analysis but not pre-specified (exploratory).
12b	No	No positivity criteria for the reference standard (clinical diagnosis only).
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve for AKI versus all hospitalized control subjects... AUC-ROC 0.93" (Results). Appropriate methods.
15	No	No mention of handling indeterminate results (e.g., missing/western blot failures).
16	No	No description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Table 1 lists demographic/clinical characteristics (e.g., age, SCr).
21a	No	No distribution of disease severity in AKI patients (e.g., staging).
21b	No	No distribution of alternative diagnoses in non-AKI controls.
22	No	No time interval reported between index test and reference standard.
23	No	No cross-tabulation (2x2 table) of index vs. reference standard results.
24	No	Reports AUC but lacks precision measures (e.g., 95% confidence intervals).
25	No	No adverse events reported.
26	Yes	Discusses cross-sectional design limitations and lack of causality (Discussion).
27	Yes	"urinary L-FABP is a highly sensitive and specific marker... prognosis of AKI" (Abstract). Clinical implications stated.
28	No	No registration number or registry name.
29	No	No mention of study protocol availability.

30	Yes	Disclosures include NIH funding and patents (Footnote).

Endre 2011

Item No.	Assessment	Support for Assessment
1	Yes	"Comparisons were made using the area under the receiver operator characteristic curve (AUC)" (Abstract). Explicitly uses AUC as a diagnostic accuracy measure.
2	Yes	Structured abstract includes study design ("prospective observational study"), methods (biomarker evaluation), results (AUC values), and conclusions (stratification improves performance).
3	Yes	Background discusses AKI diagnosis limitations and biomarker roles: "The unavoidable delay in the diagnosis of acute kidney injury...stimulated development of new urinary and plasma biomarkers" (Introduction).
4	Yes	Objectives stated: "To better understand the diagnostic and predictive performance...after patient stratification" (Abstract) and hypotheses implied in stratification analysis.
5	Yes	"Prospective observational study" (Abstract). Data collection planned before biomarker/reference standard application.
6	No	No explicit eligibility criteria (e.g., inclusion/exclusion criteria) listed in the provided text.
7	No	Basis for identifying participants (e.g., symptoms, prior tests) not explicitly described.
8	Yes	"529 patients in 2 general intensive care units (ICUs)" (Abstract). Mentions setting and location.
9	No	No description of whether participants were consecutive, random, or convenience-based.
10a	Yes	Index tests (GGT, AP, NGAL, etc.) described in detail: "urinary biomarkers...evaluated γ-glutamyltranspeptidase (GGT), alkaline phosphatase (AP)...IL-18" (Abstract).
10b	Yes	Reference standard implied as AKI defined by creatinine-based criteria: "diagnosis of AKI...based on PCr" (Introduction).
11	No	Rationale for reference standard (creatinine-based AKI criteria) not explicitly justified.
12a	No	Cut-offs for index test positivity (e.g., thresholds for biomarkers) not defined pre-specified.
12b	No	No definition of positivity cut-offs for the reference standard (AKI criteria).
13a	No	Unclear if reference standard results were available to index test assessors.
13b	No	Unclear if index test results were available to reference standard assessors.
14	Yes	Methods for accuracy estimation: "AUC for diagnosis or prediction...reassessed after stratification" (Abstract).
15	No	Handling of indeterminate/missing test results not discussed.
16	No	No description of missing data handling.
17	Yes	Variability analyzed: "Performance was improved by stratification for eGFR or time" (Abstract).
18	No	Intended sample size calculation not mentioned.

19	No	No participant flow diagram provided.
20	Yes	Baseline demographics: "Patient characteristics...shown in Tables 1a and b" (Results).
21a	No	Severity distribution of AKI (target condition) not explicitly detailed.
21b	No	Alternative diagnoses in non-AKI patients not described.
22	Yes	Time interval: "stratification for time after renal insult" (Abstract); mentions intervals (e.g., 6–12 h post-injury).
23	Yes	Cross-tabulation implied in AUC calculations and ROC analysis (e.g., Table 3).
24	Partial/No	AUCs reported but precision (e.g., 95% CIs) inconsistently provided (e.g., "AUC over 0.7" without CI in Abstract). Assessment: No (incomplete reporting).
25	No	Adverse events from tests not mentioned.
26	Yes	Limitations discussed: "considerable scatter remained" (Results), heterogeneous population limitations (Discussion).
27	Yes	Implications stated: "duration of injury and baseline renal function should be considered" (Abstract).
28	No	No registration number or registry name provided.
29	No	Full protocol accessibility not mentioned.
30	Yes	Funding sources disclosed: "Abbott Diagnostics...Cincinnati Children's Hospital...NIH Public Access" (Disclosure).

Hao 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity of PCT, CRP, and NGAL... AUC was 0.812, 0.885 and 0.804 respectively." (Explicitly reports sensitivity, specificity, and AUC as accuracy measures.)
2	Yes	Abstract includes structured sections: Objective, Methods, Results, Conclusions.
3	Yes	Introduction describes AKI diagnostic challenges and clinical role of PCT/CRP/NGAL as early biomarkers.
4	Yes	"The purpose of this study was to explore the value... in the early diagnosis of AKI." (States objectives and hypotheses.)
5	Yes	"The clinical records... were analyzed retrospectively." (Retrospective data collection confirmed.)
6	Yes	Inclusion/exclusion criteria listed under "Methods."
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior tests).
8	Yes	"86 patients who underwent UUTC surgery in our hospital from March 2020 to April 2021." (Setting, location, dates provided.)
9	No	No mention of whether participants were consecutive, random, or a convenience series.
10a	Yes	Detailed methods for PCT, CRP, NGAL detection (e.g., instruments, kits, protocols).
10b	Yes	Reference standard: KDIGO criteria for AKI diagnosis.
11	No	No rationale provided for choosing KDIGO over alternative reference standards.

12a	No	Cut-offs for PCT/CRP/NGAL positivity not pre-specified; ROC analysis implies exploratory thresholds.
12b	Yes	KDIGO criteria define AKI positivity (pre-specified creatinine/urine output thresholds).
13a	No	No information on whether reference standard results were available to index test assessors.
13b	No	No information on whether index test results were available to reference standard assessors.
14	Yes	"ROC curve evaluated PCT, CRP, and NGAL in early AKI diagnosis." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram included.
20	Yes	Table-I reports demographic/clinical characteristics (age, BMI, etc.).
21a	No	No distribution of disease severity in AKI group (e.g., AKI stages).
21b	No	No distribution of alternative diagnoses in non-AKI group.
22	No	No time interval reported between index test (postoperative biomarkers) and reference standard (AKI diagnosis).
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Partial*	Reports AUC but no confidence intervals for accuracy estimates. (*Assessment: No per STARD, as precision measures [e.g., 95% CI] are missing.)
25	No	No adverse events reported from index/reference tests.
26	Yes	"Study limitations" section discusses generalizability and sample size.
27	Yes	"Conclusions" state implications for early AKI diagnosis using biomarkers.
28	No	No registration number or registry name provided.
29	No	No mention of where the full protocol can be accessed.
30	No	No funding sources or conflicts of interest declared.

Mayer 2017

Item No.	Assessment	Support for Assessment
1	Yes	"TIMP-2 x IGFBP7 levels >0.40 (ng/mL)²/1000 measured at 1h after starting CPB were found to be the optimal cut-off with a sensitivity of 0.778 and a specificity of 0.641. Negative predictive value was 0.972." (Abstract)
2	Yes	Structured abstract includes Objective, Design, Setting, Participants, Interventions, Measurements, Results, and Conclusions.
3	Yes	Background in Introduction discusses AKI in cardiac surgery and rationale for TIMP-2 x IGFBP7 as biomarkers.
4	Yes	"We hypothesized that elevated urine levels of TIMP-2 x IGFBP7 will allow an early prediction of AKI." (Introduction)

5	Yes	"Prospective observational cohort study" (Abstract) and "prospectively enrolled 110 consecutive adult patients" (Methods).
6	Yes	Inclusion/exclusion criteria listed under "Patient Selection" (Methods).
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior tests).
8	Yes	"University Hospital of Basel, Switzerland... January through March 2014" (Methods).
9	Yes	"110 consecutive patients" (Methods).
10a	Yes	Detailed description of TIMP-2 x IGFBP7 measurement using NephroCheck™ (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI (Methods).
11	No	No rationale provided for choosing KDIGO over alternatives (e.g., RIFLE).
12a	No	Cut-off (0.40) derived post hoc; no pre-specified rationale provided.
12b	Yes	KDIGO criteria for AKI are pre-specified and standardized.
13a	No	No mention of blinding between index test and reference standard results.
13b	No	No mention of blinding between reference standard and index test results.
14	Yes	"Sensitivity, specificity, negative predictive value, and AUC" reported (Abstract and Results).
15	No	No description of handling indeterminate results.
16	No	No mention of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroups).
18	Yes	Sample size calculation based on prior study (Methods).
19	Yes	Flow diagram (Figure 1) included.
20	Yes	Baseline demographics and clinical characteristics reported (Results).
21a	No	No distribution of disease severity in AKI patients (e.g., AKI stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No discussion of time intervals or interventions between tests.
23	No	No cross-tabulation of index test vs. reference standard results.
24	Yes	"Sensitivity 0.778, specificity 0.641, NPV 0.972" with 95% CI (Abstract).
25	No	No adverse events reported.
26	Yes	Limitations include small sample size and single-center design (Discussion).
27	Yes	"Might be recommended as supplement to traditionally used criteria" (Abstract).
28	Yes	"Registered at ClinicalTrials.gov (NCT02054546)" (Methods).
29	No	No mention of where the full protocol can be accessed.
30	No	No funding sources or role of funders declared in the provided text.

Item No.	Assessment	Support for Assessment
1	Yes	"We aimed to compare the performance... AUCROC" (Abstract). The study evaluates diagnostic accuracy using AUC.
2	Yes	The abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background describes CS-AKI diagnosis challenges and the clinical role of TIMP2 IGFBP7 and creatinine.
4	Yes	"We hypothesized that... lack of postoperative decrease in pCr would be of honourable performance..." (Abstract).
5	Yes	"Prospective observational study" (Methods). Data collection was planned prospectively.
6	Yes	Inclusion/exclusion criteria: age >75, aortic valve replacement, no RRT, etc. (Methods).
7	Yes	"Eligible patients were identified on the schedule of operations" (Methods).
8	Yes	"Nantes University Hospital" and inclusion periods specified (Methods).
9	Yes	"Prospectively and consecutively included" (Methods).
10a	Yes	TIMP2 IGFBP7 measured via NEPHROCHECK®; detailed sampling times and methods (Methods).
10b	Yes	Reference standard: KDIGO criteria (pCr/urine output) (Methods).
11	No	No explicit rationale for choosing KDIGO over alternatives.
12a	Yes	"Proposed threshold of 0.3 $(ng/mL)^2/1000$" tested for TIMP2 IGFBP7 (Methods).
12b	Yes	KDIGO cutoffs (e.g., ≥26.5 µmol/L pCr) predefined (Methods).
13a	No	No mention of blinding between index test performers and reference standard results.
13b	No	No mention of blinding between reference standard assessors and index test results.
14	Yes	"AUCROC... compared" using MedCalc™ (Methods).
15	No	No description of handling indeterminate test results.
16	Yes	"No data imputation was performed" (Methods).
17	No	No analyses of variability in diagnostic accuracy.
18	Yes	Sample size justified based on funding and statistical assumptions (Methods).
19	Yes	Participant flow diagram provided (Fig. 1).
20	Yes	Baseline demographics/clinical characteristics in Table 1.
21a	Yes	Severity distribution: 25/27 CS-AKI cases were stage 1 (Results).
21b	No	No distribution of alternative diagnoses in non-CS-AKI patients.
22	Yes	Biomarkers measured pre-CPB, post-CPB, H6, and Day1 (Methods).
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	AUCROC with 95% CIs reported (Abstract, Results).
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed: small sample size, mild CS-AKI cases (Conclusions).
27	Yes	"Confirmatory studies... required" and implications for biomarker use (Conclusions).

28	No	No registration number or registry name provided.
29	No	No statement about accessing the full study protocol.
30	Yes	Funding sources and Creative Commons license disclosed (end of article).

Abd el wahab 2023

Item No.	Assessment	Support for Assessment
1	Yes	"Cys C significantly predicted AKI ($p < 0.001$)... ROC curve analysis... sensitivity (75.3%) and specificity (76.7%)" (Results). Explicitly reports sensitivity/specificity.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions. Matches STARD for Abstracts guidance.
3	Yes	Introduction details AKI challenges in cirrhosis and rationale for Cys C/Ang 2 as biomarkers. Mentions "diagnostic and prognostic utility" (Abstract).
4	Yes	"This study aimed to evaluate the diagnostic and prognostic utility..." (Abstract). Clear objectives and hypotheses.
5	Yes	"All patients were prospectively followed-up" (Methods). Confirms prospective data collection.
6	Yes	Inclusion: cirrhotic patients with AKI (KDIGO criteria). Exclusion: preexisting CKD (Subjects section).
7	Yes	Patients identified based on AKI diagnosis (KDIGO criteria: sCr/UOP changes) (Subjects).
8	Yes	"Patients were recruited from two large local tertiary care hospitals over 1 year" (Subjects).
9	No	No mention of consecutive, random, or convenience sampling. Likely convenience series but not explicitly stated.
10a	Yes	Cys C/Ang 2 measured via ELISA kits; details on blood collection and lab methods (Exposure Ascertainment).
10b	Yes	Reference standard: KDIGO criteria (sCr ≥0.3 mg/dl, UOP <0.5 ml/kg/h) (Subjects).
11	No	Rationale for KDIGO as reference standard not explicitly discussed. Assumed but not justified.
12a	No	Cut-offs (e.g., Cys C ≥2.795 ng/ml) derived post hoc via ROC; no pre-specified thresholds mentioned.
12b	Yes	KDIGO criteria for AKI (pre-specified cut-offs for sCr/UOP) (Subjects).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve analysis... logistic regression... estimates of OR and 95% CI" (Methods/Results).
15	No	No mention of handling indeterminate results (e.g., missing Cys C/Ang 2 values).
16	No	No discussion of missing data handling for index/reference tests.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation described.
19	No	No participant flow diagram provided.
20	Yes	Tables 1 and 2 summarize demographics, clinical characteristics, and lab data.

21a	No	No distribution of AKI severity (e.g., Stage 1/2/3 breakdown by target condition).
21b	No	No distribution of alternative diagnoses in non-AKI patients (all participants had AKI).
22	No	No mention of time interval between index tests (Cys C/Ang 2) and reference standard (KDIGO).
23	No	No 2x2 table cross-tabulating index test vs. reference standard results.
24	Partial*	Reports sensitivity/specificity but no 95% CIs for these estimates. AUC mentioned without CI (e.g., Figure 2).
25	No	No adverse events from Cys C/Ang 2 testing reported.
26	Yes	"Study limitations... small sample size, single-center design" (Discussion).
27	Yes	"Cys C showed validity for AKI diagnosis... Ang 2 was an independent predictor of mortality" (Conclusion).
28	No	No registration number or registry name provided.
29	No	No mention of where the full protocol can be accessed.
30	No	No funding sources or role of funders declared in the article.

Mossanen 2017

Item No.	Assessment	Support for Assessment
1	Yes	"estimates of diagnostic accuracy and their precision (such as 95% confidence intervals)" are reported in ROC analysis (Figure 2A).
2	Yes	Abstract includes structured sections: "Abstract: ... Methods: ... Results: ... Conclusions: ...".
3	Yes	Introduction details AKI clinical relevance and roles of suPAR/proENK: "suPAR may be a predictive biomarker...".
4	Yes	Hypothesis stated: "We hypothesized that pre-surgery suPAR and proENK levels might predict AKI...".
5	Yes	"Consecutive patients (n = 107) undergoing elective cardiac surgery were studied prospectively."
6	No	No explicit eligibility criteria (e.g., exclusion/inclusion criteria) described.
7	No	Basis for identifying participants (e.g., symptoms, registries) not specified beyond "elective cardiac surgery".
8	No	Setting ("University Hospital Aachen") mentioned, but dates of recruitment omitted.
9	Yes	"Consecutive patients... were studied prospectively."
10a	Yes	"suPAR levels were determined by enzyme linked immunoassay (ELISA)" (Methods).
10b	No	AKI diagnosis based on creatinine changes (reference standard) is mentioned but not operationally defined (e.g., KDIGO criteria).
11	No	Rationale for using creatinine-based AKI diagnosis as reference standard not explicitly justified.
12a	No	Pre-specified cut-offs for suPAR/proENK positivity not defined; exploratory ROC analysis used.
12b	No	AKI staging criteria (e.g., creatinine thresholds) not explicitly defined.
13a	No	Unclear if reference standard results (AKI status) were available during index test interpretation.
13b	No	Unclear if index test results influenced reference standard assessment.
14	Yes	"ROC curve analysis" and "area under the curve (AUC)" methods described (Results).

15	No	Handling of indeterminate/missing test results (e.g., assay failures) not addressed.
16	No	No description of missing data management for suPAR/proENK or creatinine.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	Intended sample size calculation not reported.
19	No	No participant flow diagram provided.
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	No	Severity distribution of AKI (stage I-III) provided, but not linked to biomarker performance.
21b	No	Alternative diagnoses in non-AKI patients (e.g., CKD) not analyzed separately.
22	No	Time interval between index test (pre-surgery) and reference standard (post-surgery AKI) not explicitly defined.
23	No	No cross-tabulation of index test results vs. reference standard (e.g., 2x2 table).
24	Yes	"suPAR levels... ROC curve analysis... AUC = 0.70" (Results).
25	No	Adverse events from biomarker testing not mentioned.
26	Yes	Limitations discussed: "small sample size... single-center design... CKD confounding".
27	Yes	Implications stated: "suPAR may be a predictive biomarker... clinical utility".
28	No	No trial registration number or registry name provided.
29	No	Protocol accessibility not mentioned.
30	Yes	Funding: "Sphingotec GmbH" and institutional affiliations declared.

Yang 2022

Item No.	Assessment	Support for Assessment
1	Yes	"We evaluated the utility of NephroCheck for predicting AKI development and short-term mortality...ROC curve and reclassification analyses." (Measures of accuracy, including AUC, are used.)
2	Yes	The abstract includes structured sections: Background, Methods, Results, Conclusions, aligning with STARD for Abstracts.
3	Yes	"NephroCheck would be a useful biomarker for early ruling-in or ruling-out of AKI in the ED." (Describes intended clinical role.)
4	Yes	"We evaluated the utility of NephroCheck for predicting AKI development and short-term mortality in the ED." (Clear objectives and hypotheses.)
5	Yes	"This was a prospective, observational...study...data collection was planned before testing." (Prospective design stated.)
6	Yes	Inclusion/exclusion criteria detailed: ED score ≥30%, acute diseases, exclusions (e.g., age <21, dialysis).
7	Yes	Participants identified based on "acute diseases" or ED physician's clinical risk assessment (symptoms/results).
8	Yes	"Five hospitals in five countries...enrollment dates: October 2018–October 2019." (Setting and dates provided.)
9	Yes	"We consecutively enrolled ED patients..." (Consecutive series explicitly stated.)

10a	Yes	"TIMP-2/IGFBP7 was measured...using the VITROS Immunodiagnostic products...urine processing steps described." (Replicable index test details.)
10b	Yes	Reference standard: KDIGO criteria (sCr and urine output), with measurement methods and timing specified.
11	Yes	"KDIGO criteria...best available method for AKI diagnosis." (Rationale for reference standard provided.)
12a	Yes	"Cutoffs...0.3 (high sensitivity) and 2.0 (high specificity)...pre-specified from prior studies." (Predefined cutoffs.)
12b	Yes	KDIGO criteria for AKI (predefined sCr/urine thresholds) used as reference standard.
13a	Yes	"Two independent physicians...blinded to the NephroCheck values." (Index test blinded to reference results.)
13b	Yes	Reference standard assessors blinded to index test results, as stated in Methods.
14	Yes	"ROC curve...AUC comparison, reclassification analyses." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	Excluded 289 patients for "incomplete data," but no explicit methods for handling missing data.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroups not pre-specified as exploratory).
18	No	No sample size calculation or justification provided.
19	Yes	Figure 1 illustrates participant flow through the study.
20	Yes	Table 1 summarizes baseline demographics and clinical characteristics.
21a	No	Severity distribution (e.g., AKI stages) in the target condition group not reported.
21b	Yes	Non-AKI group subdivided into stable CKD, kidney dysfunction, and preserved function.
22	Yes	Time intervals: sCr measured at T0, T24, T48; urine collected at T0 and T48.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results in the manuscript.
24	Yes	"AUC, 0.64 vs. 0.53...95% confidence intervals" reported for accuracy estimates.
25	No	No mention of adverse events from index or reference tests.
26	Yes	Limitations discussed: single biomarker, missing urine output data, generalizability.
27	Yes	"NephroCheck would be a useful biomarker for early ruling-in or ruling-out AKI in the ED." (Clinical implications stated.)
28	No	No trial registration number or registry name provided.
29	No	No statement on availability of the full study protocol.
30	Yes	"Supported by grants...Ortho Clinical Diagnostics provided test kits." (Funding sources disclosed.)

Albeladi 2017 Here is the extracted table in Markdown format:

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity and specificity" and "ROC curve" are mentioned in the Abstract and Keywords.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background describes AKI in critically ill patients and uNGAL's role as a predictor.

4	Yes	Objectives stated: "assess the value of uNGAL as a predictor of AKI, severe AKI, and the need for RRT."
5	Yes	"prospective cohort study" (Methods section).
6	Yes	Inclusion/exclusion criteria listed (age ≥18, SBP <90, etc.).
7	Yes	Participants identified based on ICU admission and AKI risk factors (e.g., hypotension).
8	Yes	"ICU at King Abdulaziz University Hospital... between May 2012 and June 2013."
9	Yes	"consecutively admitted" (Methods).
10a	Yes	uNGAL measurement details: timing (t=0, 6, 12, 24, 36h) and methods.
10b	Yes	Reference standard: RIFLE criteria and cystatin C levels for AKI diagnosis.
11	No	No explicit rationale for choosing RIFLE/cystatin C over alternatives.
12a	No	uNGAL cut-offs derived from ROC analysis (exploratory, not pre-specified).
12b	Yes	Predefined RIFLE criteria and cystatin C thresholds for AKI severity.
13a	No	No mention of blinding between index test and reference standard assessors.
13b	No	No mention of blinding between reference standard and index test results.
14	Yes	"ROC curves," "AUC," and "sensitivity/specificity" used (Data Analysis section).
15	No	No description of handling indeterminate uNGAL or reference standard results.
16	No	No mention of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No justification for sample size (n=75).
19	No	No participant flow diagram.
20	Yes	Baseline demographics (age, gender) and clinical characteristics (APACHE II, SOFA) reported.
21a	No	No distribution of disease severity in AKI patients (e.g., staging).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No time interval between uNGAL measurement and reference standard.
23	No	No cross-tabulation of uNGAL results vs. reference standard.
24	Partial	AUC reported but no confidence intervals for sensitivity/specificity (e.g., "excellent predictors for RRT").
25	No	No adverse events from uNGAL testing mentioned.
26	Yes	Limitations: small sample size, single-center design (Conclusions).
27	Yes	Implications: uNGAL's utility for predicting RRT (Conclusions).
28	No	No registration number or registry name.
29	No	No protocol accessibility statement.
30	Partial	Ethical approvals mentioned, but funding sources not explicitly stated.

Han 2009

Item No.	Assessment	Support for Assessment
1	Yes	"The diagnostic utility of urinary kidney injury molecule-1 (KIM-1), N-acetyl-β-D-glucosaminidase (NAG), and neutrophil gelatinase associated lipocalin (NGAL) was evaluated... Receiver-operating characteristic curves were generated and the areas under the curve (AUCs) compared..." (Abstract)
2	Yes	Structured abstract includes Background, Methods, Results, Conclusions.
3	Yes	Background explains AKI's clinical significance, Scr limitations, and the role of biomarkers.
4	Yes	"The diagnostic utility... was evaluated for the early detection of postoperative AKI..." (Abstract); Objectives stated in Introduction.
5	Yes	"A prospective study of 90 adults undergoing cardiac surgery" (Abstract); urine samples collected prospectively.
6	Yes	"Exclusion criteria... chronic dialysis support, death within 24h" (Methods).
7	Yes	Participants identified as "adult patients undergoing cardiac surgery" (Methods).
8	Yes	"Columbia University Medical Center, June 25, 2005 to January 11, 2006" (Methods).
9	No	Enrollment described as "prospectively studied" but no explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Urinary biomarkers measured at 5 time points, ELISA methods detailed, normalized to creatinine (Methods).
10b	Yes	Reference standard: AKI defined by Scr increase >0.3 mg/dl within 72h (AKIN criteria).
11	Yes	Rationale for Scr as reference: "current RIFLE and AKIN criteria... based on Scr" (Introduction).
12a	No	No pre-specified cut-offs for biomarkers; ROC curves used post-hoc. No distinction between pre-specified vs. exploratory.
12b	Yes	Pre-specified Scr cut-off (>0.3 mg/dl) per AKIN criteria.
13a	No	"Measurements were made... in a blinded fashion" (Methods), implying no access to reference results.
13b	No	No explicit statement on whether biomarker results influenced Scr assessment (unlikely, but not confirmed).
14	Yes	"ROC curves... AUCs calculated and compared" (Methods).
15	No	No mention of indeterminate results or how they were handled.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup variability).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram; described textually only.
20	Yes	Table 3 lists baseline demographics and clinical characteristics.
21a	No	Severity distribution (e.g., AKI stages) not detailed beyond Stage 1/2.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Timing of biomarker (up to 24h) and Scr (72h) measurements specified.

23	No	No 2x2 table or cross-tabulation of biomarker vs. Scr results.
24	No	AUCs reported without confidence intervals (e.g., "AUCs for KIM-1... 0.68 and 0.65").
25	No	No adverse events reported.
26	Yes	Limitations discussed: single-center, Scr as reference, sample size (Discussion).
27	Yes	Conclusion states "combination of urinary biomarkers may allow early detection" (Abstract).
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	Funding: "Supported by NIH... Role of funders acknowledged" (Acknowledgments).

Liu 2015

Item No.	Assessment	Support for Assessment
1	Yes	"the sensitivity and specificity of serum Klotho for early detecting clinical AKI are unknown... AUC-ROC was used to assess the sensitivity and specificity" (Abstract). Explicitly mentions sensitivity, specificity, and AUC.
2	Yes	Structured abstract includes study design, methods, results, and conclusions under headings (Abstract, Results, Discussion).
3	Yes	Background in Introduction describes AKI's clinical role and Klotho's potential as a biomarker.
4	Yes	"This prospective study evaluated the significance of serum Klotho for early detection of postoperative AKI... compared the utilities of serum Klotho, serum creatinine and cystatin C" (Abstract). Clear objectives.
5	Yes	"This prospective study" (Abstract) implies data collection was planned before tests.
6	Yes	Exclusion criteria listed: "preexisting renal insufficiency, serious cardiac insufficiency..." (Patients selection).
7	Yes	Participants identified based on cardiac valve replacement surgery and AKI development within 48h (Methods).
8	No	Mentions "Surgical Intensive Care Unit, The First Affiliated Hospital, Sun Yat-Sen University" but no specific dates (Patients selection).
9	No	No mention of consecutive, random, or convenience sampling in participant selection.
10a	Yes	"serum Klotho concentrations were determined utilizing the human klotho ELISA Kit" (Methods). Sufficient detail for replication.
10b	No	AKIN criteria referenced but no explicit description of how SCr measurements were standardized (e.g., timing, lab protocols).
11	No	No rationale provided for choosing AKIN over other AKI definitions (e.g., KDIGO).
12a	No	ROC cutoffs calculated post-hoc (Table 4) but no pre-specified thresholds mentioned.
12b	No	AKIN criteria used but no rationale for its cutoffs (e.g., why ≥26.4 μmol/L SCr).
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curves... AUC" (Methods) and statistical methods for accuracy measures.

15	No	No mention of handling indeterminate results (e.g., missing Klotho/SCr values).
16	No	No description of missing data handling (e.g., exclusion, imputation).
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	No sample size calculation; only final sample size stated (n=35).
19	No	No participant flow diagram (textual description only).
20	Yes	Table 1 provides baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity in AKI group (e.g., AKI stages).
21b	No	No distribution of alternative diagnoses in non-AKI group.
22	No	Time intervals between index test (Klotho) and reference standard (SCr) not explicitly stated.
23	No	No 2x2 contingency table cross-tabulating Klotho results against AKIN diagnosis.
24	Yes	AUCs with 95% CIs reported for Klotho, SCr, and cystatin C (Tables 3, 4; Figure 2).
25	No	No mention of adverse events from Klotho or SCr measurements.
26	Yes	Limitations discussed: small sample size, single-center design, need for larger studies (Discussion).
27	Yes	"Serum Klotho could serve as a potential biomarker... during the short period after cardiac surgery" (Abstract). Clinical implications stated.
28	No	No registration number or registry name provided.
29	No	No link or statement about accessing the full study protocol.
30	No	Funding sources and ethical approval mentioned, but no details on funder roles (Methods).

Khawaja 2019

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve (AUC) at12hr was 0.82 (95% CI 0.68–0.96) with a sensitivity of 70.8% and specificity of 90.9%." Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: background, purpose, methods, results, and conclusions.
3	Yes	Introduction discusses limitations of SCr and rationale for NGAL as a biomarker for AKI in sepsis.
4	Yes	"The objective of this study is to assess the ability of pNGAL to predict early AKI in critically ill adult patients presenting with sepsis."
5	Yes	"In this prospective study..." confirms data collection was planned prospectively.
6	Yes	Inclusion/exclusion criteria listed under "Inclusion criterion" and "Exclusion criterion."
7	Yes	Participants identified based on "suspected sepsis" per SIRS criteria.
8	Yes	"Conducted at...Aga Khan University Hospital...during December 2014 to August 2015."
9	No	No mention of consecutive, random, or convenience sampling; only states "recruited over a nine-month period."

10a	Yes	pNGAL measured via "fluorescence immunoassay on Triage® Meter Pro" with sampling intervals (12h, 24h, 48h).
10b	Yes	Reference standard: RIFLE criteria ("twofold increase in SCr from baseline").
11	No	No rationale provided for choosing RIFLE over other AKI criteria (e.g., KDIGO).
12a	Yes	"Cut off 150 ng/ml of Plasma NGAL...for the Prediction of Acute kidney injury" with reference to prior studies.
12b	Yes	RIFLE-SCr criteria defined as "twofold increase in SCr from baseline," pre-specified.
13a	No	No information on blinding of index test performers to clinical/reference standard data.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Diagnostic accuracy...assessed by ROC analysis and AUC calculation."
15	No	No mention of handling indeterminate results for pNGAL or SCr.
16	No	No description of missing data handling (e.g., excluded patients due to death/discharge).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	Yes	Figure 1: Flow diagram of participant recruitment and outcomes.
20	Yes	Table 1 reports demographics (age, gender, BMI, comorbidities).
21a	No	No distribution of disease severity in AKI patients (e.g., RIFLE stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals between tests: pNGAL measured at 12h, 24h, 48h; SCr used at 48h.
23	No	Sensitivity/specificity reported, but no 2x2 contingency table for test vs. reference.
24	Yes	"AUC at12hr was 0.82 (95% CI 0.68–0.96)...AUC at 24h was 0.86 (95% CI 0.74–0.97)."
25	No	No adverse events from pNGAL or SCr testing mentioned.
26	Yes	Limitations: Small sample size, single-center design, and lack of long-term outcomes.
27	Yes	"pNGAL allows diagnosis of AKI 48h prior to RIFLE criteria...may improve patient outcomes."
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	Funding: Open Access statement and Creative Commons license; no explicit funder role.

Ya-fen 2024

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analysis showed an AUC of 0.832 for serum NGAL reduction, with a cut-off value of −111.24 ng/ml and sensitivity and specificity rates of 76.2% and 81.2%, respectively." Explicitly reports AUC, sensitivity, and specificity.

2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusion. Matches STARD for Abstracts guidance.
3	Yes	Introduction explains NGAL's role in AKI repair and rationale for predicting CKD progression. States intended use: "early warning of SA-AKI progression to CKD."
4	Yes	Abstract: "our objective was to investigate the predictive value of serum and urine fluctuations of NGAL..."; Introduction: "evaluate whether fluctuations...could predict the progression to CKD."
5	Yes	Methods: "we performed a retrospective study." Data collection occurred after index test and reference standard.
6	Yes	Inclusion/exclusion criteria clearly listed under "Inclusion criteria and exclusion criteria."
7	Yes	Participants identified based on sepsis (Sepsis 3.0) and AKI (KDIGO 2012): "matching the diagnostic criteria of sepsis 3.0...and AKI from KDIGO 2012."
8	Yes	"Yangzhou University-affiliated hospital between 4 Jan and 30 Dec, 2022." Specifies setting, location, and dates.
9	No	No mention of consecutive, random, or convenience sampling. Methods state enrollment but lack selection methodology details.
10a	Yes	"Serum and urine NGAL was tested by ELISA kit (mlbio, shanghai, ml064308)." Sufficient detail for replication.
10b	Yes	Reference standard: "eGFR <60 ml/min/1.73 m^2 for 3 months" per KDIGO 2012. Clearly defined.
11	No	No rationale provided for choosing KDIGO as the reference standard (alternatives not discussed).
12a	No	Cut-off (−111.24 ng/ml) derived post hoc from ROC analysis; no pre-specified thresholds mentioned.
12b	Yes	Reference standard cut-offs pre-specified by KDIGO: "eGFR <60...last for 3 months."
13a	No	No information on whether clinical data/reference standard results were available to NGAL assessors.
13b	No	No information on whether NGAL results were available to CKD assessors.
14	Yes	"ROC analysis," "sensitivity and specificity," and "logistic regression" used to estimate accuracy.
15	No	No mention of handling indeterminate NGAL or reference standard results.
16	No	Exclusion criteria include "insufficiency of clinical data," but no methods for handling missing data during analysis.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses or reproducibility).
18	No	No justification for sample size (n=425) or power calculation.
19	No	No participant flow diagram; textual description only.
20	Yes	Table 1: "Baseline demographic and clinical characteristics."
21a	No	Disease severity (AKIN stages) reported in Methods but not distributed across CKD/non-CKD groups in results.
21b	No	No distribution of alternative diagnoses in non-CKD participants (excluded other AKI causes but not analyzed).
22	Yes	Time interval defined: NGAL measured at T0 (diagnosis) and T1 (48h later); reference standard at 3 months.
23	No	No 2x2 table cross-tabulating NGAL reduction against CKD progression.
24	No	Sensitivity/specificity reported without confidence intervals (e.g., "76.2% and 81.2%").
25	No	No adverse events from NGAL or reference standard mentioned.
26	Yes	Discussion: Limitations include retrospective design, single-center, and lack of mechanistic exploration.
27	Yes	Conclusion: "Reduction of serum NGAL...early warning indicator for the progression of CKD." Clinical role clarified.

28	No	No trial registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	No	Funding sources not disclosed in the provided text (cutoff before acknowledgments).

Park 2019

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver-operating characteristic curve analysis was used to evaluate the ability to predict AKI in sepsis patients." and "The area under the curve for predicting of AKI was higher for a urinary NGAL of 0.820 (95% confidence interval (CI) 0.721–0.895)." Explicitly uses AUC as a measure of diagnostic accuracy.
2	Yes	Structured abstract with "Background," "Methods," "Results," and "Conclusion" sections under the abstract.
3	Yes	Introduction describes sepsis, AKI diagnosis limitations, and the clinical role of NGAL: "early detection of AKI is necessary... urinary NGAL concentration may predict AKI."
4	Yes	Objectives stated: "The purpose of this study was to evaluate the diagnostic performance of urinary NGAL in predicting AKI in sepsis patients."
5	No	"We conducted a retrospective study." Data collection occurred after tests were performed.
6	Yes	Inclusion/exclusion criteria: "patients older than 18 years... exclusion criteria: 1) end-stage renal disease..., 2) refusal..., 3) malignant terminal cancer."
7	Yes	Basis for eligibility: "patients who visited our emergency department with suspected infectious disease."
8	Yes	Setting: "tertiary urban hospital in Seoul, South Korea," with dates: "June 2016 to December 2016."
9	No	No mention of consecutive, random, or convenience sampling. States "reviewed all medical records" but does not clarify selection method.
10a	Yes	Index test (urinary NGAL) details: "measured using a chemiluminescent microparticle immunoassay... measurement range 10–6000 ng/ml."
10b	Yes	Reference standard (AKI diagnosis) details: "based on serum creatinine and urine output per KDIGO guidelines... MDRD formula used if baseline creatinine unknown."
11	Yes	Rationale for reference standard: "current method for diagnosing AKI" described in Introduction, with limitations justifying NGAL evaluation.
12a	Yes	Pre-specified NGAL cut-off: "optimal cut-off value for urinary NGAL was 359 ng/ml" determined via ROC analysis.
12b	No	No explicit definition of positivity cut-offs for the reference standard (AKI staging thresholds not detailed).
13a	Unclear	No information on whether clinical data/reference standard results were available to NGAL test performers. Assumed "No" due to lack of explicit statement.
13b	Unclear	No information on whether index test results were available to reference standard assessors. Assumed "No."
14	Yes	Methods for accuracy estimation: "ROC curve analysis... sensitivity, specificity, AUC, and 95% CIs reported."
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No discussion of missing data handling for NGAL or reference standard.

17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No intended sample size calculation or justification provided.
19	No	No participant flow diagram. Text describes exclusion of 77 patients but no visual diagram.
20	Yes	Baseline demographics: Table 1 includes age, gender, and clinical characteristics by group.
21a	No	No distribution of disease severity in AKI patients (e.g., AKI stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time interval: "highest AKI stage during the first 48 h after admission." Implies tests were performed within this window.
23	No	No cross-tabulation of index test vs. reference standard results (e.g., 2x2 table).
24	Yes	Accuracy estimates: "AUC 0.820 (95% CI 0.721–0.895), sensitivity 78.8%, specificity 73.7%."
25	No	No mention of adverse events from NGAL or reference standard tests.
26	Yes	Limitations: "retrospective design... small sample size... single-center study."
27	Yes	Implications: "urinary NGAL may predict AKI... useful biomarker in emergency departments."
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	Funding: "This research did not receive any specific grant from funding agencies."

Xie 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve was 0.66 in predicting all AKI and 0.70 in predicting stages 2 and 3 AKI. The resulting sensitivity and specificity were 44.0% and 83.9%." (Explicitly reports diagnostic accuracy measures including AUC, sensitivity, and specificity.)
2	Yes	The abstract includes structured sections: Introduction, Methods, Results, and Conclusions, summarizing design, methods, and key findings.
3	Yes	"The clinical role of a test explains its position relative to existing tests...TIMP-2·IGFBP7 determines tubular stress markers, which may occur prior to tubular damage." (Background and intended use of the index test described in Introduction.)
4	Yes	"This study aimed to explore the predictive value of TIMP-2·IGFBP7 measurements for the early detection of AKI and short-term adverse outcomes." (Explicitly states objectives.)
5	Yes	"In the prospective cohort study..." (Data collection planned before index test and reference standard.)
6	Yes	"Inclusion: adult patients undergoing cardiac surgery. Exclusion: CKD stages 4–5, anuria, preoperative AKI." (Eligibility criteria clearly listed.)
7	Yes	"All adult patients who underwent cardiac surgery...at San Bortolo Hospital." (Participants identified based on surgery type and setting.)
8	Yes	"From March 2017 to 2018 at San Bortolo Hospital (Vicenza, Italy)." (Specifies location and dates.)
9	No	No mention of consecutive, random, or convenience sampling in recruitment. Flowchart describes exclusions but not enrollment method.

10a	Yes	"Urine samples were analyzed for TIMP-2 and IGFBP7 using NephroCheck®...concentration reported as (ng/mL)²/1,000." (Sufficient detail for replication.)
10b	Yes	"AKI was defined based on the KDIGO consensus guidelines...stages 1–3 criteria." (Reference standard clearly defined.)
11	No	No rationale provided for choosing KDIGO over alternative reference standards (e.g., RIFLE, AKIN).
12a	No	The cutoff (0.265) was derived from ROC analysis; no pre-specified rationale for this threshold.
12b	Yes	KDIGO criteria for AKI stages were pre-specified and referenced.
13a	No	No information on whether reference standard results were available to index test performers.
13b	No	No information on whether index test results were available to reference standard assessors.
14	Yes	"Empirical receiver operating characteristic curves, AUC, sensitivity, specificity, NPV, and PPV were calculated." (Methods for accuracy measures described.)
15	No	No mention of handling indeterminate results (e.g., missing biomarker values).
16	No	"65 [patients] excluded due to incomplete data," but no explicit protocol for handling missing data.
17	No	No analysis of variability in diagnostic accuracy across subgroups or pre-specified factors.
18	No	No sample size calculation or justification provided.
19	Yes	Figure 1 shows a flowchart of participant enrollment and exclusions.
20	Yes	Table 1 details baseline demographics, comorbidities, and clinical characteristics.
21a	Yes	"134 (24.06%) developed AKI...33 (5.9%) had moderate or severe AKI." (Severity distribution reported.)
21b	No	No description of alternative diagnoses in non-AKI patients.
22	No	No discussion of time intervals between index test (post-surgery 6–12 h) and reference standard (days 1–7).
23	No	No 2x2 contingency table comparing index test results against reference standard.
24	No	AUC reported, but no confidence intervals for sensitivity, specificity, or AUC estimates.
25	No	No mention of adverse events from TIMP-2·IGFBP7 testing or reference standard.
26	Yes	Limitations include single-center design, sample size, and lack of generalizability (discussed in Conclusion).
27	Yes	"Postoperative implementation of TIMP-2·IGFBP7 improved prediction...may aid in identifying high-risk patients." (Clinical implications stated.)
28	No	No registration number or registry name provided.
29	No	No statement on availability of the full study protocol.
30	Yes	"Sources of funding and other support" acknowledged in the Conflict of Interest statement.

Varela 2015

Item No.	Assessment	Support for Assessment

1	Yes	"Sensitivity and specificity of FeU... were assessed... ROC analysis of FeU and NGAL yielded similar values." Mentions sensitivity, specificity, and AUC.
2	Yes	Structured abstract with "Background", "Methods", "Results", and "Conclusion" sections.
3	Yes	"AKI diagnosis... relies on serum creatinine, which is slow... FeU may discriminate prerenal vs. established AKI." Describes clinical role of index test.
4	Yes	"The aim of our study is to evaluate... FeU in early diagnosis of AKI." Explicit objective.
5	Yes	"We performed a prospective study." Data collection planned before tests.
6	Yes	"Exclusion: CKD, AKI before surgery, contrast exposure <72h." Eligibility criteria listed.
7	No	No description of how potentially eligible participants were identified (e.g., symptoms, registries).
8	No	No details about setting/location/dates of participant identification beyond "Hospital Italiano de Buenos Aires."
9	No	Unclear if participants formed consecutive/random/convenience series. Not stated.
10a	Yes	"FeU measured at 1, 6, 24h... creatinine/urea determined by photometry." Sufficient index test details.
10b	Yes	"AKI defined by AKIN criteria... serum creatinine and urine output." Clear reference standard.
11	Yes	"AKIN criteria... best available method." Rationale for reference standard.
12a	Yes	"FeU cut-off not predefined but ROC analysis used." Exploratory cut-offs implied.
12b	Yes	AKIN criteria thresholds pre-specified (0.3 mg/dL creatinine increase, etc.).
13a	No	No information on whether reference standard results were available to index test assessors.
13b	No	No information on whether index test results influenced reference standard assessment.
14	Yes	"ROC curves... sensitivity/specificity calculated." Methods for accuracy measures described.
15	No	No mention of handling indeterminate/missing test results.
16	No	No description of missing data handling.
17	No	No analyses of variability in diagnostic accuracy.
18	No	Sample size justification: "n=50 estimated... included 66." No statistical power calculation.
19	No	No participant flow diagram provided.
20	Yes	"68±11 years, 26% female... comorbidities listed." Baseline demographics reported.
21a	No	No distribution of disease severity in AKI group (only AKIN stages 1-3%).
21b	No	No alternative diagnoses in non-AKI group described.
22	Yes	Samples collected "1, 6, 24h post-surgery." Time interval between tests addressed.
23	Yes	Table 2 cross-tabulates FeU/NGAL results vs. AKIN outcomes (implied in ROC analysis).
24	Yes	"FeU: 75% sensitivity, 79.5% specificity... AUC 0.786." Precision estimates provided.
25	No	No adverse events from tests reported.
26	Yes	"Study limitations: small sample, single center." Limitations discussed.
27	Yes	"FeU is comparable to NGAL... useful for early AKI diagnosis." Clinical implications stated.

28	No	No registration number/registry name provided.
29	No	No protocol accessibility statement.
30	Yes	"Servicio de Nefrología... conducted study." Funding/support sources partially described.

Haase-fielitz 2009 Here is the extracted table in Markdown format:

Item No.	Assessment	Support for Assessment
1	Yes	"We defined an area under the receiver operating characteristic curve [...] as excellent in terms of predictive value." (Explicit use of AUC-ROC as a diagnostic accuracy measure).
2	Yes	Structured abstract includes design, methods, results, and conclusions.
3	Yes	Background describes the clinical role of novel biomarkers (e.g., NGAL, cystatin C) versus conventional biomarkers (creatinine/urea) for AKI prediction.
4	Yes	Objectives stated: "To compare the value of novel with conventional serum biomarkers [...] according to preoperative renal function."
5	Yes	"Prospective observational study" (Data collection planned before index/reference tests).
6	Yes	Eligibility criteria: Inclusion/exclusion criteria listed under "Patient Population."
7	Yes	Patients identified based on undergoing cardiac surgery with CPB (clinical context).
8	Yes	"Single-center [...] tertiary hospital" with exclusion of emergency/off-pump surgeries (setting specified).
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Index tests (NGAL, cystatin C, creatinine, urea) described with measurement methods and timing (e.g., "plasma NGAL was measured by Triage Meter").
10b	Yes	Reference standard defined as ≥50% increase in creatinine or composite endpoint (RRT/mortality).
11	Yes	Rationale: Creatinine is the clinical standard for AKI diagnosis despite limitations.
12a	Yes	Predefined cutoffs for biomarker positivity (AUC categories and "best threshold" based on ROC curves).
12b	Yes	AKI diagnosis criteria predefined as ≥50% creatinine increase.
13a	No	Unclear whether reference standard results were blinded to index test assessors.
13b	No	No information on blinding of index test results to reference standard assessors.
14	Yes	Methods include AUC-ROC comparisons and Hanley & McNeil statistical analysis.
15	No	No mention of handling indeterminate results for biomarkers or AKI classification.
16	No	No description of missing data handling.
17	Yes	Subgroup analysis by preoperative renal function (pre-specified variability analysis).
18	Yes	Sample size calculation: "99 patients [...] to detect a difference in AUC-ROC of 0.1."

19	No	No participant flow diagram provided.
20	Yes	Demographic/clinical characteristics in Tables 1 and 2.
21a	No	No severity distribution of AKI (e.g., RIFLE stages beyond binary classification).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals specified: Biomarkers measured at ICU arrival (6h post-CPB) and 24h postoperatively.
23	Yes	Cross-tabulation implied via AUC-ROC and predictive performance tables (e.g., sensitivity/specificity).
24	Yes	AUC-ROC values with 95% CIs reported (e.g., "plasma NGAL [...] AUC 0.80–0.89").
25	No	No adverse events from biomarker testing mentioned.
26	Yes	Limitations discussed: Single-center design, no urine biomarkers, small sample size.
27	Yes	Implications: NGAL/cystatin C are superior to conventional biomarkers for early AKI detection.
28	No	No registration number or registry name provided.
29	No	No protocol accessibility statement.
30	Yes	Funding sources disclosed (ANZCA, Austin Hospital Trust Fund, Alexander von Humboldt-Foundation).

Li 2023

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analysis was applied to assess the predictive ability of SUA levels for in-hospital mortality... AUC of SUA was 0.65 with a sensitivity of 51% and a specificity of 73%." (Abstract)
2	Yes	Structured abstract includes "Background," "Methods," "Results," and "Conclusions." (Abstract)
3	Yes	Background describes SUA as a potential prognostic marker for AKI outcomes. (Background section)
4	Yes	"The aim of this study was to investigate the association of SUA levels with clinical outcomes of AKI patients." (Abstract)
5	Yes	"The data of AKI patients... were retrospectively reviewed." (Methods)
6	Yes	Inclusion/exclusion criteria listed under "Inclusion and exclusion criteria." (Methods)
7	Yes	Participants identified based on KDIGO 2012 criteria for AKI. (Methods)
8	Yes	"Hospitalized in the Affiliated Hospital of Qingdao University from January 2015 to July 2020." (Methods)
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	No	SUA measurement methods (e.g., laboratory technique) not detailed.
10b	No	Reference standard (in-hospital mortality) not explicitly defined (e.g., how death was confirmed).
11	No	No rationale provided for using in-hospital mortality as the reference standard.
12a	No	SUA quartiles used as cut-offs but not pre-specified; rationale for quartiles based on data distribution.

12b	No	No reference standard cut-offs defined (binary outcome: mortality).
13a	No	Unclear if assessors of SUA were blinded to clinical outcomes.
13b	No	Unclear if mortality assessors were blinded to SUA results.
14	Yes	"Multivariable logistic regression... ROC analysis." (Methods)
15	No	No mention of handling indeterminate SUA or mortality results.
16	Yes	"Missing values were replaced by mean or median values." (Methods)
17	No	Subgroup analyses performed but labeled as exploratory, not pre-specified.
18	No	No sample size calculation or power analysis reported.
19	Yes	Figure 1: Flow chart of patient selection.
20	Yes	Table 1: Baseline demographic and clinical characteristics.
21a	No	AKI severity distribution (stages 1-3) reported but not linked to target condition outcomes.
21b	No	No distribution of alternative diagnoses in non-target condition patients (all had AKI).
22	No	Time interval between SUA measurement and outcome assessment not specified.
23	No	No 2x2 table comparing SUA results with mortality; results presented via regression and ROC.
24	Yes	"OR of 1.72 (95% CI, 1.21–2.33)... AUC of 0.65." (Results)
25	No	No adverse events reported from SUA testing or outcome assessment.
26	Yes	Limitations include retrospective design and potential confounding. (Discussion)
27	Yes	"SUA appears to be an independent prognostic marker." (Conclusions)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	Funding sources and affiliations listed at the end.

Wang 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The ROC curve demonstrated that RI (AUC = 0.906)..." (Measures of accuracy like AUC are used).
2	Yes	Structured abstract with Background, Methods, Results, and Conclusions.
3	Yes	Introduction describes sepsis, AKI, limitations of current tests, and rationale for ultrasound evaluation.
4	Yes	"This study aimed to discuss the diagnostic value..." (Explicit objectives).
5	Yes	"The medical history data... were retrospectively analyzed." (Data collection was retrospective).
6	Yes	Inclusion/exclusion criteria detailed under "General information."
7	Yes	"Based on the presence of AKI" and Sepsis-3/KDIGO criteria.

8	Yes	"Sinopharm Dongfeng General Hospital... May 2020 to May 2022."
9	No	No mention of consecutive, random, or convenience sampling method.
10a	Yes	MPUS scoring criteria (Table 1) and RI/RPT measurement methods described.
10b	Yes	Reference standard: KDIGO criteria for AKI (serum creatinine/urine output).
11	No	No rationale provided for choosing KDIGO over other standards.
12a	Yes	Predefined MPUS cut-offs in Table 1.
12b	Yes	KDIGO criteria define AKI positivity (creatinine ≥26.5 µmol/L within 48h).
13a	No	No information on blinding of index test assessors to reference results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve... AUC" and logistic regression used.
15	No	No mention of handling indeterminate results.
16	Yes	"Only subjects with complete data... were considered."
17	No	No analysis of variability in accuracy measures.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Baseline demographics in Table 2.
21a	No	No distribution of AKI severity (e.g., KDIGO stages).
21b	No	No alternative diagnoses listed for non-AKI group.
22	No	No time interval between index test and reference standard reported.
23	No	No 2x2 table comparing index test vs. reference standard results.
24	No	AUC reported but no confidence intervals for accuracy estimates.
25	No	No adverse events mentioned.
26	Yes	Limitations: retrospective design, single-center, small sample.
27	Yes	"RI showed high diagnosis values for sepsis complicated with AKI."
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	No	Funding sources not declared; only states "no conflict of interest."

Wang 2017

Item No.	Assessment	Support for Assessment

1	Yes	"measured the sensitivity and specificity of uIL-18 and uNGAL levels... using the receiver operating characteristic (ROC) curve and area under curve (AUC)."
2	Yes	Abstract includes structured sections: study design, methods (sample collection, tests), results (AUC, sensitivity/specificity), conclusions.
3	Yes	Introduction describes AKI after CPB, limitations of Scr, and clinical need for early biomarkers.
4	Yes	"we aimed to investigate the application value of uIL-18 and uNGAL... in early diagnosis of AKI."
5	Yes	"collected the urine samples before and at 2, 4, 6, 8 and 12 h after CPB" (prospective planning).
6	Yes	Inclusion criteria: no renal/hepatic dysfunction, tumors, or nephrotoxic drugs; stable vital signs; AKI diagnostic criteria.
7	Yes	Participants identified based on undergoing CPB surgery (March–October 2014).
8	Yes	"Zhengzhou No. 7 People's Hospital" and dates (March–October 2014) specified.
9	No	No mention of consecutive, random, or convenience sampling method.
10a	Yes	Index tests (uIL-18/uNGAL) described: ELISA methods, sample collection times, kit details.
10b	Yes	Reference standard: AKI defined by Scr >26.5 μM or >50% increase from baseline.
11	No	No explicit rationale for choosing Scr as the reference standard (alternatives not discussed).
12a	No	Cut-offs (1.6 μg/L for uIL-18; 100 μg/L for uNGAL) derived from ROC analysis (exploratory, not pre-specified).
12b	Yes	AKI diagnostic criteria (Scr thresholds) pre-specified based on guidelines.
13a	No	No information on whether Scr results were available during index test interpretation.
13b	No	No information on whether uIL-18/uNGAL results influenced Scr assessment.
14	Yes	"ROC curve and AUC were used to evaluate sensitivity and specificity."
15	No	No mention of handling indeterminate test results.
16	No	Missing data handling not discussed.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	Sample size justification (e.g., power calculation) not provided.
19	No	No participant flow diagram.
20	Yes	Age, gender, and baseline Scr reported for AKI/non-AKI groups.
21a	No	Severity distribution of AKI (e.g., stages) not described.
21b	No	Alternative diagnoses in non-AKI group not reported.
22	Yes	Time intervals between CPB and sample collection (index/reference tests) specified.
23	No	No cross-tabulation of index test results against reference standard (only ROC data provided).
24	No	Sensitivity/specificity reported without confidence intervals.
25	No	Adverse events not mentioned.
26	No	Limitations (e.g., single-center design, small sample) not explicitly discussed.
27	Yes	"uIL-18 shows a more promising diagnostic value... in early diagnosis of AKI" (clinical implication).

28	No	No registration number or registry name provided.
29	No	No statement on protocol availability.
30	No	Funding sources and roles not declared (only ELISA kit vendor mentioned).

Adler 2018

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve (AUC) for the development of AKI was 0.97 (CI 0.90–1.00)... sensitivity was 96.8% and specificity was 94.1%." (Explicitly reports AUC, sensitivity, and specificity.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	"Early identification of patients at high risk of AKI is hampered by the low sensitivity of the established tests... This novel test may help to identify patients at high risk of AKI." (Describes clinical role of the index test.)
4	Yes	"The present study aimed to determine the diagnostic utility... for the early recognition of AKI." (States objective.)
5	Yes	"The performance of [TIMP-2]·[IGFBP7] was prospectively analysed." (Prospective design stated.)
6	Yes	"Inclusion criteria: OHCA, ROSC, GCS ≤8... Exclusion: pregnancy, chronic renal replacement therapy, death within 24 h." (Eligibility criteria detailed.)
7	Yes	"Patients with non-traumatic OHCA... admitted to the cardiac ICU... were consecutively enrolled." (Identified based on clinical condition.)
8	Yes	"University Hospital of Cologne between May 2014 and January 2016." (Location and dates specified.)
9	Yes	"Patients... were consecutively enrolled." (Consecutive series.)
10a	Yes	"Urinary [TIMP-2]·[IGFBP7] samples were collected at 3 and 24 h... measured with NephroCheck™ point-of-care test." (Index test methods replicable.)
10b	Yes	"AKI was classified according to KDIGO guidelines... increase in serum creatinine or reduced urine secretion." (Reference standard defined.)
11	No	No explicit rationale provided for choosing KDIGO as the reference standard.
12a	No	Cut-off (0.24) derived post hoc via ROC analysis; no pre-specified rationale.
12b	No	KDIGO criteria used but no rationale for cut-offs (e.g., serum creatinine thresholds) provided.
13a	No	Unclear if reference standard results were blinded to index test assessors.
13b	No	Unclear if index test results were blinded to reference standard assessors.
14	Yes	"ROC analysis... AUC, sensitivity, specificity, Youden index." (Methods for accuracy estimation described.)
15	No	No mention of handling indeterminate/missing test results.
16	No	No description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation provided.

19	Yes	Figure 1: Flow diagram of participant inclusion/exclusion.
20	Yes	"Mean age of 63 ± 11 years... 87.5% presented with cardiogenic shock." (Baseline demographics reported.)
21a	No	Severity distribution of AKI (e.g., KDIGO stages) not detailed.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test and reference standard not explicitly stated.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC 0.97 (CI 0.90–1.00)... sensitivity 96.8%, specificity 94.1%." (Accuracy estimates with precision.)
25	No	No mention of adverse events from tests.
26	Yes	"Study limitations include small sample size and single-center design." (Limitations discussed.)
27	Yes	"This novel test may help identify high-risk patients for clinical studies." (Clinical implications stated.)
28	No	No registration number or registry name provided.
29	No	No protocol accessibility mentioned.
30	Yes	"Sources of funding... Creative Commons Attribution 4.0 International License." (Funding and licensing disclosed.)

Kim 2017

Item No.	Assessment	Support for Assessment
1	Yes	"ROC curves and the area under the curves (AUC) were used... PENK was superior to NGAL in predicting AKI (P =0.022) and RRT (P =0.0085)." (Explicit use of diagnostic accuracy measures.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction explains sepsis, AKI, and roles of PENK/NGAL. "The intended use... early recognition merits a prompt intervention."
4	Yes	"We investigated the diagnostic and prognostic utility of plasma PENK..." (Clear objectives/hypotheses.)
5	No	Retrospective design: "medical records were reviewed... remnant blood samples" (Data collected after index/reference tests).
6	Yes	"167 septic patients were enrolled: 99 with sepsis, 37 with septic shock, 31 with suspected sepsis." (Eligibility criteria described.)
7	Yes	"Patients were identified based on suspicion of sepsis... diagnostic criteria of Surviving Sepsis Campaign 2012."
8	Yes	"Konkuk University Medical Center, Seoul, Korea... December 2014 to June 2015." (Setting/dates specified.)
9	No	Convenience sampling: "except for 81 patients without available samples" (No consecutive/random recruitment).
10a	Yes	PENK/NGA: assay details provided, including devices, ranges, and imprecision.
10b	Yes	Reference standard: "KDIGO criteria... serum Cr delta value assessed 48 hr post enrollment."
11	No	No explicit rationale for choosing KDIGO over other AKI criteria.
12a	Yes	PENK cut-off: "99th percentile... 80 pmol/L"; NGAL: "150 ng/mL" (Pre-specified thresholds).

12b	No	KDIGO criteria referenced but no explicit cut-off definitions (e.g., Cr thresholds) provided.
13a	No	No mention of blinding index test performers to clinical/reference data.
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	"ROC curves... sensitivity, specificity, AUCs... 95% CIs." (Methods for accuracy estimation).
15	No	No discussion of handling indeterminate test results.
16	No	Missing data: "81 patients excluded due to unavailable samples" (No further handling described).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	"This sample size was thought to have approximately 90% power..." (Sample size justification).
19	No	Text describes participant flow but no diagram included.
20	Yes	Table 1 summarizes demographics, clinical characteristics, and outcomes.
21a	Yes	"Distribution of severity" shown in sepsis groups (Table 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	"Serum Cr delta value... 48 hr post enrollment." (Time interval specified).
23	No	No cross-tabulation (2x2 table) of index vs. reference test results.
24	Yes	"AUCs... 95% CI" reported for PENK/NGAL (Accuracy estimates with precision).
25	No	No adverse events from PENK/NGAL testing mentioned.
26	Yes	Limitations: "single-center... eGFR equations not validated for critically ill."
27	Yes	"PENK constitutes a promising biomarker in critical care..." (Implications for practice).
28	No	No registration number or registry name provided.
29	No	No mention of study protocol accessibility.
30	Yes	"Sphingotec GmbH provided reagents... funding organization had no role."

Irqsusi 2022

Item No.	Assessment	Support for Assessment
1	Yes	"Predictive value for [TIMP-2] × [IGFBP7] was shown... sensitivity was 84.6% and the specificity 55.6%... AUC of 0.725 and 0.718." (Explicitly reports sensitivity, specificity, and AUC.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	"Early recognition may alter their prognosis... intended use of urinary TIMP-2 and IGFBP7 as predictors for AKI." (Describes clinical role of the index test.)
4	Yes	"In this pilot study, we investigated the function of the Nephrocheck™test... tested the assumption of urinary TIMP-2 and IGFBP7 can predict AKI..."

		(States objectives and hypotheses.)
5	Yes	"Demographic, intra-, and postoperative data were recorded prospectively." (Prospective data collection.)
6	Yes	"Exclusion criteria included... Cleveland-Score >7, age <35 years, acute infection, emergency surgery, end-stage renal disease." (Eligibility criteria listed.)
7	Yes	"50 male patients requiring elective coronary artery bypass grafting and/or valve surgery..." (Identified based on surgical procedure.)
8	No	No explicit mention of dates or specific locations beyond "University Hospital of Giessen and Marburg."
9	Yes	"Repetitive blood and urine samples were collected consecutively from 50 patients." (Consecutive series.)
10a	Yes	"NephroCheck™Test (Astute Medical)... measures TIMP-2 and IGFBP7 concentrations using fluorescence-immunoassay." (Detailed index test methodology.)
10b	Yes	"AKI defined by KDIGO classification... serum creatinine rise by 0.3 mg/dl within 48 h..." (Reference standard clearly defined.)
11	Yes	"KDIGO classification... suggested time frame for cardiac surgery induced AKI..." (Rationale for KDIGO as reference.)
12a	Yes	"Ideal calculated cutoff at 0.07... previously suggested cutoffs of 0.3 and 2.0." (Defines and rationalizes cutoffs.)
12b	Yes	KDIGO criteria are pre-specified and internationally recognized.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curves... AUC... sensitivity and specificity calculations." (Methods for diagnostic accuracy estimation.)
15	No	No mention of handling indeterminate test results.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram; only textual description.
20	Yes	Table 1: "Baseline demographic and clinical characteristics of participants."
21a	No	No distribution of disease severity in AKI patients (all were KDIGO stage 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Samples collected at specific time points: "preoperatively, intraoperatively... 0, 6, 12, 24 h after ICU admission." (Time interval defined.)
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC of 0.725 and 0.718... sensitivity and specificity with cutoffs." (Accuracy estimates and precision.)
25	Yes	"No patient... suffered in-hospital death or required dialysis." (Reports absence of adverse events.)
26	Yes	"Study limitations... small sample size, single-center design." (Explicit limitations.)
27	Yes	"Postoperative risk assessment for AKI can be established by [TIMP-2] × [IGFBP7]." (Implications for practice.)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.

30	No	Funding sources not declared; only states "no conflicts of interest."

Parikh 2005

Item No.	Assessment	Support for Assessment
1	Yes	"Urine IL-18 demonstrates an area under the receiver operating characteristic curve of 73%... sensitivity and specificity of ≥90%" (Explicitly reports AUC, sensitivity, and specificity).
2	Yes	Abstract includes structured sections: study design (nested case-control), methods (IL-18 ELISA), results (AUC, OR), and conclusions (early diagnostic marker).
3	Yes	Background discusses limitations of serum creatinine and rationale for urine IL-18 as an early AKI biomarker.
4	Yes	"The objective of this study was to determine whether urine IL-18 is an early marker of AKI..." (Explicitly states objectives).
5	No	Retrospective analysis: "Our study was performed on a subset of patients... urine samples were centrifuged and frozen" (Uses pre-existing samples from prior trials).
6	Yes	"Excluded 285 patients with baseline creatinine ≥1.2 mg/dl... selected patients with ≥50% serum creatinine increase" (Defined inclusion/exclusion criteria).
7	Yes	Participants identified from the ARDS Network trial based on AKI diagnosis (serum creatinine changes).
8	Yes	"Enrolled from March 1996 to March 1999... ARDS Network trial" (Specifies setting and dates).
9	No	Cases selected based on AKI development; controls randomly sampled but not explicitly consecutive or fully randomized: "Two control patients were randomly selected... prevented 'survivor bias'" (Convenience sampling).
10a	Yes	"IL-18 was measured... using a human IL-18 ELISA kit... centrifuged, supernatant used, blinded analysis" (Detailed index test protocol).
10b	No	Reference standard: "AKI defined as ≥50% serum creatinine increase." Lacks details on creatinine measurement methods (e.g., assay type, timing).
11	No	No rationale provided for choosing serum creatinine as the reference standard over alternatives.
12a	No	Cut-off >100 pg/ml derived post hoc via ROC analysis; no pre-specified thresholds mentioned.
12b	Yes	Pre-specified reference standard: "AKI defined as ≥50% serum creatinine increase within 6 days" (Explicitly defined).
13a	Yes	"Personnel blinded to case/control status performed assays" (Index test blinded to reference standard).
13b	No	No information on whether creatinine assessors were blinded to IL-18 results.
14	Yes	"Sensitivity, specificity, ROC curves, multivariable logistic regression" (Appropriate statistical methods).
15	No	No mention of handling indeterminate IL-18 or creatinine results.
16	No	No description of missing data handling (e.g., excluded samples).
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.

19	No	No participant flow diagram included.
20	Yes	Table 1 lists demographics, clinical characteristics, and outcomes.
21a	No	Severity of AKI (e.g., staging) not reported.
21b	No	No distribution of alternative diagnoses in non-AKI controls.
22	No	Time interval between IL-18 testing and creatinine measurement unclear (e.g., exact timing of sample collection).
23	No	No 2x2 contingency table for sensitivity/specificity calculations.
24	Yes	"AUC 73%... OR 6.5 (95% CI 2.1–20.4)" (Accuracy estimates with precision).
25	No	No adverse events reported from urine collection or testing.
26	Yes	Limitations: retrospective design, survivor bias, single biomarker focus.
27	Yes	"Urinary IL-18 levels can be used for early diagnosis of AKI" (Clinical implications stated).
28	No	No trial registration number or registry name provided.
29	No	No mention of protocol availability.
30	Partial	"NIH-sponsored ARDS Network trials" (Funding source noted), but no role of funders described.

Torregrosa 2015

Item No.	Assessment	Support for Assessment
1	Yes	"In the ROC analysis, AUC for KIM-1, NGAL and L-FABP was 0.713, 0.958 and 0.642, respectively..." (Explicitly reports AUC as a measure of diagnostic accuracy).
2	Yes	Abstract includes structured summary of design, methods, results, and conclusions (e.g., objectives, biomarkers tested, AUC results, and implications).
3	Yes	Introduction describes clinical background, need for early AKI biomarkers, and the role of urinary biomarkers compared to serum creatinine.
4	Yes	"The aim of this work was to assess the usefulness of urinary determinations of KIM-1, NGAL and L-FABP..." (Clear study objective).
5	Yes	"All patients were prospectively monitored starting at their inclusion in the study..." (Prospective data collection).
6	Yes	Exclusion criteria listed: age <18, CKD on dialysis/transplant, cardiogenic shock-related AKI, and exclusion of patients undergoing both angiography/surgery.
7	Yes	Patients identified based on undergoing coronary angiography or cardiac surgery for acute coronary syndrome/heart failure.
8	Yes	"Hospital Clínico Universitario de Valencia between May 2008–December 2009 and January–June 2011" (Setting, location, dates specified).
9	No	No explicit mention of whether participants were consecutive, random, or a convenience series.
10a	Yes	"KIM-1, L-FABP and NGAL were measured in urine samples using ELISA kits... diluted at 1:20... minimum detectable levels provided" (Sufficient detail for replication).

10b	Yes	Reference standard: Serum creatinine-based AKI diagnosis per RIFLE criteria ("increase in serum creatinine beyond 50%").
11	No	No rationale provided for choosing RIFLE criteria over alternative AKI definitions (e.g., KDIGO).
12a	Yes	"Urine samples were collected 12 h after surgery... values of biomarkers were adjusted for urinary creatinine" (Pre-specified cut-offs for timing and normalization).
12b	Yes	RIFLE criteria defined and used as reference standard (pre-specified).
13a	Unclear	Not explicitly stated whether reference standard results (serum creatinine) were available to index test assessors.
13b	Unclear	No information on whether index test results were available to reference standard assessors.
14	Yes	"ROC curves... sensitivity and specificity... AUC with 95% CI" (Methods for accuracy estimation described).
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data handling for biomarkers or serum creatinine.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses or pre-specified variability assessments).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram or textual description of recruitment/exclusions.
20	Yes	Table 1 details demographic/clinical characteristics (age, sex, baseline creatinine, comorbidities).
21a	No	No distribution of disease severity in AKI patients (e.g., staging by RIFLE beyond binary classification).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	"Urine samples were collected 12 h after intervention" and serum creatinine monitored up to 6 days (Time interval between tests addressed).
23	Yes	ROC curves and Table 3 imply cross-tabulation of biomarker results vs. RIFLE-based AKI diagnosis.
24	Yes	"AUC of 0.958 (95% CI 0.909–1.007)" (Accuracy estimates with precision).
25	No	No adverse events reported from urine collection or biomarker testing.
26	Yes	"Further studies are still needed... clinical utility of biomarkers in different settings" (Limitations acknowledged).
27	Yes	"Urinary KIM-1... predictive of AKI... NGAL shows higher sensitivity/specificity" (Implications for clinical use).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	"This study was approved by... Ethical Committee... All subjects gave informed consent" (Ethical approval and consent stated, though funding sources not explicitly listed).

Zhang 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The receiver operating-characteristic curve (ROC) analysis was used to predict mortality. The predictive power of p-PENK and p-NGAL was assessed

		using the area under the receiver operating characteristic curve (AUROC)." (Reports AUC values for diagnostic accuracy.)
2	Yes	Structured abstract includes Background, Methods, Results, and Conclusions.
3	Yes	Introduction discusses AKI prognosis challenges and the clinical role of PENK/NGAL as biomarkers.
4	Yes	"Our goal is to more accurately assess the prognoses of patients with AKI...using commonly tested biomarkers." (Explicit objective stated.)
5	Yes	"This prospective study...comprised 150 patients." (Prospective design confirmed.)
6	Yes	Inclusion/exclusion criteria listed under "Methods" (KDIGO criteria, exclusion of discharged/missing data patients).
7	Yes	"Consecutive patients...admitted to the ICU" identified based on AKI diagnosis.
8	Yes	"Taizhou Hospital of Zhejiang Province...between January 2019 and December 2019." (Setting and dates specified.)
9	Yes	"Consecutive patients" included in the study.
10a	Yes	Detailed methods for p-PENK and p-NGAL measurement (ELISA kits, sample handling).
10b	No	Reference standard (28-day mortality) lacks replication details (e.g., how death was confirmed).
11	No	No rationale provided for choosing 28-day mortality as the reference standard over alternatives.
12a	Yes	Cut-offs defined using Youden index: "The truncated value...was 0.36 ng/μL and 230.30 ng/mL."
12b	No	Reference standard (mortality) is binary; no cut-offs or categories to define.
13a	No	No mention of blinding index test performers to clinical/reference standard data.
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	"Multivariate Cox regression," "Kaplan-Meier," and "ROC analysis" used to estimate accuracy.
15	No	No description of handling indeterminate test results.
16	No	Excluded patients with missing data but did not explain methods for addressing missingness.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram (text describes exclusions but no figure).
20	Yes	Table 1 reports demographic/clinical characteristics (age, gender, comorbidities, etc.).
21a	Yes	AKI stages (1-3) distribution reported in Table 1.
21b	No	All participants had AKI; no alternative diagnoses in non-target condition group.
22	Yes	Blood samples collected "within 24 hours" after AKI diagnosis; outcome tracked for 28 days.
23	No	No 2x2 contingency table of index test vs. reference standard results.
24	Yes	"Adjusted hazard ratios...95% confidence intervals" and AUCs with 95% CIs reported.
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed: single-center, small sample, potential confounders.
27	Yes	"Serum PENK and NGAL levels...improved accuracy of predicting mortality" (implications for practice).
28	No	No registration number or registry name provided.

29	No	No statement about protocol accessibility.
30	Yes	"The authors declare that no funds, grants, or other support were received..." (Funding disclosure).

Zhang 2024

Item No.	Assessment	Support for Assessment
1	No	The study compares suPAR levels between groups but does not explicitly mention diagnostic accuracy measures (e.g., sensitivity, specificity, AUC).
2	No	No structured summary of study design, methods, results, or conclusions is provided in the supplementary material.
3	No	No background on the intended clinical role of suPAR as a diagnostic test is described.
4	No	Study objectives and hypotheses are not explicitly stated.
5	No	No information on prospective or retrospective data collection.
6	No	Eligibility criteria (inclusion/exclusion) are not defined.
7	No	Basis for identifying participants (e.g., symptoms, prior tests) is not described.
8	No	Setting, location, and dates of participant identification are missing.
9	No	No mention of consecutive, random, or convenience sampling.
10a	No	Insufficient detail on suPAR measurement methods (e.g., assay type, protocols).
10b	No	Reference standard (e.g., AKI diagnostic criteria like KDIGO) is not described.
11	No	Rationale for the reference standard is not provided.
12a	No	No pre-specified positivity cut-offs or rationale for suPAR thresholds.
12b	No	No definition of reference standard positivity criteria.
13a	No	Unclear if index test performers had access to reference standard results.
13b	No	Unclear if reference standard assessors had access to index test results.
14	No	Methods for estimating diagnostic accuracy (e.g., ROC analysis) are absent; only p-values are reported.
15	No	Handling of indeterminate results (e.g., missing suPAR values) is not addressed.
16	No	No description of missing data management.
17	No	No analysis of variability in diagnostic accuracy.
18	No	Sample size justification is not provided.
19	No	No participant flow diagram.
20	No	Baseline demographics (e.g., age, sex) are not reported in Table S1; only suPAR levels are compared.
21a	No	Severity distribution (e.g., AKI stages) is shown in Figure S3 but lacks explicit participant counts or clinical details.
21b	No	Alternative diagnoses in non-AKI patients are not described.

22	No	Time interval between index test and reference standard is not specified.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	No	Diagnostic accuracy estimates (e.g., sensitivity, 95% CIs) are missing; only p-values for group differences are reported.
25	No	Adverse events are not mentioned.
26	No	Study limitations are not discussed.
27	No	Implications for clinical use of suPAR are not addressed.
28	No	No registration number or registry name.
29	No	Protocol accessibility is not mentioned.
30	No	Funding sources and roles are not declared.

Cho 2013

Item No.	Assessment	Support for Assessment
1	Yes	"The diagnostic performances, assessed by the area under the ROC curve, were 0.773 for NGAL and 0.780 for L-FABP" (Abstract). Explicit use of AUC as a diagnostic accuracy measure.
2	Yes	Structured abstract includes sections: Background, Objectives, Methods, Results, Conclusions (Abstract).
3	Yes	Background discusses AKI diagnosis limitations and the role of biomarkers (Introduction).
4	Yes	"This study aimed to determine the diagnostic and prognostic abilities of urinary L-FABP" (Abstract). Clear objectives stated.
5	Yes	"We prospectively collected data on patients admitted... from July 2010 to June 2011" (Methods). Prospective design confirmed.
6	Yes	Inclusion/exclusion criteria: "adult patients older than 18 yr," excluding ESRD or life expectancy <48 hr (Methods).
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior test results).
8	Yes	"Korea University Medical Center, Seoul, Korea" and study period specified (Methods).
9	No	No mention of consecutive, random, or convenience sampling; stated as "prospective observational study" without further detail.
10a	Yes	Urinary NGAL and L-FABP measurement methods described in detail, including kits and procedures (Methods).
10b	Yes	AKIN criteria defined with serum creatinine thresholds (Methods).
11	No	No rationale provided for choosing AKIN over alternative reference standards (e.g., RIFLE or KDIGO).
12a	No	Cut-off values (e.g., 28.45 ng/mL for L-FABP) determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	AKIN criteria pre-defined and widely accepted; no exploratory adjustments mentioned.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve analysis" and "AUC-ROC comparison using MedCalc" described (Statistical Analysis).

15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of methods to address missing data.
17	No	No analysis of variability in diagnostic accuracy across subgroups or conditions.
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram; only textual description of enrollment.
20	Yes	Table 1 lists demographic/clinical characteristics (e.g., age, comorbidities, SAPS II).
21a	Yes	AKI severity distribution by AKIN stages (stage 1-3) reported (Results).
21b	No	No description of alternative diagnoses in non-AKI patients.
22	No	No discussion of time interval between index test and reference standard or clinical interventions during this period.
23	No	No 2x2 contingency table comparing index test and reference standard results.
24	Yes	AUCs with 95% CIs reported (e.g., "0.780 [0.702-0.857] for L-FABP") (Results).
25	No	No adverse events from urinary biomarker testing mentioned.
26	Yes	Limitations noted: "needs to be further validated for clinical utility" (Abstract).
27	Yes	"Urinary L-FABP seems promising... for diagnosis and prognosis" (Abstract). Implications for practice stated.
28	No	No registration number or registry name provided.
29	No	No link or reference to a publicly available study protocol.
30	No	No funding sources or sponsor roles declared in the text.

Gunnerson 2016

Item No.	Assessment	Support for Assessment
1	Yes	"Biomarker performance was assessed using the area under the receiver operating characteristic curve" (Abstract, Results). Explicitly reports AUC-ROC.
2	Yes	Structured abstract includes BACKGROUND, STUDY DESIGN, RESULTS, and CONCLUSION sections.
3	Yes	Background discusses AKI complications, limitations of existing biomarkers, and intended clinical role of TIMP2•IGFBP7 for early risk stratification.
4	Yes	"Our goal... was to test the hypothesis that the TIMP2•IGFBP7 test would correctly identify... surgical patients at high risk for developing AKI." (Background).
5	Yes	"preplanned analysis of surgical patients using data from two multicenter clinical studies" (Patients and Methods). Prospective data collection.
6	Yes	"adult surgical patients at risk for AKI" with inclusion criteria described (Patients and Methods).
7	Yes	Patients identified based on admission to ICU with respiratory/cardiovascular dysfunction (Patients and Methods).
8	No	Mentions "39 intensive care units across Europe and North America" but no specific dates provided.

9	No	No description of whether participants were consecutive, random, or convenience series.
10a	Yes	Detailed description of TIMP2•IGFBP7 assay methods (Biomarker Assays section).
10b	Yes	Reference standard defined as KDIGO stages 2-3 and clinical adjudication (Study Design).
11	Yes	"KDIGO guidelines have further advanced consensus... reference standard" (Background).
12a	Yes	Predefined cutoff of TIMP2•IGFBP7 >0.3 $(ng/mL)^2/1,000$ used (not explicitly stated here but inferred from prior studies).
12b	Yes	KDIGO criteria for AKI stages 2-3 are pre-specified reference categories.
13a	Yes	"technicians who were unaware of the clinical data" (Biomarker Assays).
13b	No	No information on whether index test results were blinded to reference standard assessors.
14	Yes	"AUC-ROC, integrated discrimination improvement, and category-free net reclassification improvement" (Study Design).
15	No	No description of handling indeterminate test results.
16	Yes	"Six subjects... test results from the second collection... were used" (Statistical Analysis).
17	No	No analysis of variability in diagnostic accuracy across subgroups beyond sensitivity analyses.
18	No	No sample size calculation described for this surgical subgroup analysis.
19	Yes	Figure 1 provides a participant flow diagram.
20	Yes	Table 1 reports demographic/clinical characteristics.
21a	No	No distribution of disease severity in patients with AKI (only incidence reported).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No explicit time interval reported between index test and reference standard.
23	No	No cross-tabulation of index test vs. reference standard results (only AUC reported).
24	Yes	"AUC-ROC... 0.84 (95% CI: 0.76–0.90)" (Results).
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed including subgroup analysis constraints (Conclusion).
27	Yes	"Inclusion in clinical risk prediction models significantly enhances their performance" (Conclusion).
28	Yes	ClinicalTrials.gov IDs NCT01209169 and NCT01573962 provided.
29	No	No statement about accessing the full study protocol.
30	Yes	Disclosures include funding sources/roles (e.g., Astute Medical provided assays).

Tekce 2015

Item No.	Assessment	Support for Assessment
1	Yes	"A receiver operating characteristic analysis revealed that AT1-KIM-1U concentrations may predict AKI with an 87.5% sensitivity and 93.3%

		specificity (area under the curve = 0.94)."
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Introduction describes cisplatin-induced nephrotoxicity and limitations of traditional biomarkers, highlighting KIM-1's potential role.
4	Yes	"We studied whether urinary and serum KIM-1... were useful in predicting cisplatin-induced AKI in early stages." (Abstract)
5	Yes	"We prospectively analysed 22 patients..." (Methods)
6	Yes	Inclusion/exclusion criteria detailed under "Study population" and "Exclusion criteria."
7	No	No explicit description of how participants were identified (e.g., via symptoms, prior tests).
8	Yes	"Consecutive patients... admitted to the Oncology department... between September 2012 and June 2013." (Methods)
9	Yes	"We observed prospectively consecutive patients..." (Methods)
10a	Yes	Detailed KIM-1 measurement methods: sample collection, storage, ELISA kits, and procedures.
10b	Yes	AKIN criteria for AKI diagnosis described: "stage 1 AKI based on elevation in sCr ≥1.5–2 folds... in 48 h."
11	No	No rationale provided for choosing AKIN criteria over other reference standards.
12a	No	KIM-1 cut-offs determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	AKIN criteria cut-offs (sCr-based) were pre-specified.
13a	No	No mention of blinding; clinical information/reference standard availability to KIM-1 testers unclear.
13b	No	No mention of blinding; KIM-1 results' availability to AKIN assessors unclear.
14	Yes	"ROC curve analysis... sensitivity, specificity, AUC, and 95% CI reported." (Methods)
15	No	No description of handling indeterminate KIM-1 or AKIN results.
16	No	No mention of missing data handling (e.g., exclusion, imputation).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroups).
18	No	No sample size justification (e.g., power calculation).
19	No	No participant flow diagram; textual description only.
20	Yes	Table 1 lists baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity in AKI patients (e.g., AKIN stages beyond stage 1).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Sample collection timing specified: BT, AT1, AT3, AT5. AKI assessed at AT3.
23	No	No 2x2 table cross-tabulating KIM-1 results against AKIN outcomes.
24	Yes	"AUC = 0.94 (95% CI = 0.75–0.99)... sensitivity 87.5%, specificity 93.3%."
25	No	No adverse events reported from KIM-1 testing or AKIN assessment.
26	Yes	"Study limitations... small sample size... requires validation in larger studies." (Discussion)
27	Yes	"KIM-1U concentrations may predict cisplatin-induced AKI... with high sensitivity and specificity." (Abstract)
28	No	No registration number or registry name provided.

29	No	No mention of a publicly accessible study protocol.
30	No	No funding sources or funder roles declared.

Udzik 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The authors attempt to provide new data regarding the application of novel kidney injury biomarkers in the early diagnostics of CSA-AKI... ROC analysis was conducted to assess the biomarkers' potential (AUC > 0.5, p < 0.001)."
2	Yes	Abstract includes structured sections: Introduction, Methods, Results, Conclusions.
3	Yes	"The intended use... is early diagnosis of CSA-AKI... a promising alternative for creatinine measurements."
4	Yes	"The authors attempt to provide new data... objectives to evaluate biomarkers for early detection."
5	Yes	"128 adult patients undergoing elective cardiac surgery... samples taken 6h post-CPB." Implies prospective data collection.
6	No	Eligibility criteria only mention "adult patients undergoing cardiac surgery with CPB"; no detailed inclusion/exclusion criteria provided.
7	Yes	Participants identified based on undergoing "elective cardiac surgery with CPB."
8	No	No explicit mention of specific recruitment dates or detailed settings beyond institutional affiliation.
9	No	No information on whether participants were consecutive, random, or convenience-based.
10a	No	Biomarkers measured but no details on assay methods (e.g., ELISA protocols) for replication.
10b	Yes	Reference standard: "KDIGO guidelines... based on serum creatinine."
11	No	Rationale for KDIGO as reference standard not explicitly stated.
12a	No	Cut-offs determined via ROC analysis; described as "exploratory" and needing revision.
12b	Yes	KDIGO criteria use pre-specified creatinine thresholds.
13a	No	No information on whether clinical/reference data were available during index test analysis.
13b	No	No information on whether index test results influenced reference standard assessment.
14	Yes	"ROC analysis... AUC, sensitivity, specificity."
15	No	No mention of handling indeterminate biomarker or creatinine results.
16	No	Missing data handling not discussed.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	Sample size (n=128) mentioned, but no justification or power calculation.
19	No	No participant flow diagram included in the provided text.
20	Yes	Table 1 details demographic/clinical characteristics.
21a	No	No distribution of AKI severity (e.g., KDIGO stages) in the target group.

21b	No	No description of alternative diagnoses in non-AKI participants.
22	No	Time interval between index test (6h post-CPB) and reference standard (up to 5 days) noted, but interventions during this period not addressed.
23	No	No 2x2 table or cross-tabulation of index test vs. reference standard results.
24	No	AUC reported, but no confidence intervals for sensitivity/specificity in the abstract.
25	No	Adverse events from biomarker testing not mentioned.
26	Yes	"Study limitations... sample size and need for further validation."
27	Yes	"Implications for practice... promising alternative for creatinine measurements."
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	"Sources of funding and other support; role of funders" declared in the copyright statement.

Breidthardt 2012

Item No.	Assessment	Support for Assessment
1	Yes	"The prognostic accuracy... as quantified by the area under the receiver operating characteristic curve (AUC)" (Abstract). Explicitly reports AUC.
2	Yes	Abstract includes structured sections: Introduction, Methods, Results, Conclusions.
3	Yes	Background describes AKI as a clinical problem and NGAL's role as a biomarker (Introduction).
4	Yes	"We aimed to examine NGAL levels in the prediction of AKI in patients with AHF" (Introduction).
5	Yes	"This prospective study..." (Methods). Prospective data collection stated.
6	Yes	Inclusion: >18 y/o with AHF symptoms; Exclusion: chronic hemodialysis (Methods).
7	Yes	Eligibility based on symptoms/signs of AHF (Methods).
8	Yes	"Emergency departments... from April 2006 to August 2009" (Methods).
9	Yes	"207 consecutive patients" (Methods). Consecutive series.
10a	Yes	NGAL measured via Triage® immunoassay with details (Methods).
10b	Yes	AKI defined by AKIN classification with creatinine criteria (Methods).
11	No	No rationale provided for choosing AKIN criteria over other standards.
12a	No	NGAL cut-offs not pre-defined; exploratory analysis used.
12b	Yes	AKIN criteria thresholds explicitly defined (Methods).
13a	Unclear	Not reported whether reference standard results were available during NGAL testing.
13b	Unclear	Not reported whether NGAL results influenced AKIN assessment.
14	Yes	ROC analysis and AUC comparisons (Results).
15	No	No mention of handling indeterminate NGAL/AKI results.

16	No	Missing data strategy not described (4 excluded patients mentioned).
17	No	No variability analyses (e.g., inter-reader differences).
18	No	No sample size justification or power calculation provided.
19	Yes	Figure 1 shows participant flow diagram.
20	Yes	Table 1 reports demographics and clinical characteristics.
21a	No	Severity distribution of AKI (stages 1-3) reported, but not linked to disease severity.
21b	No	Alternative diagnoses in non-AKI patients not described.
22	Yes	Creatinine measured at presentation, daily, and discharge (Methods).
23	Yes	Implicit in ROC/AUC analysis; cross-tabulation inferable from accuracy metrics.
24	Yes	"Creatinine 0.69; 95%CI 0.59–0.79 versus NGAL 0.67; 95%CI 0.57–0.77" (Results).
25	No	No adverse events reported from NGAL or creatinine testing.
26	Yes	Limitations discuss mediocre accuracy and generalizability (Conclusions).
27	Yes	"Plasma NGAL levels do not adequately predict AKI..." (Abstract). Clinical implication stated.
28	No	No registration number or registry name provided.
29	No	Full protocol accessibility not mentioned.
30	Yes	Funding sources and Alere's role in NGAL assays described (Methods).

Shapiro 2010

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity (95% confidence interval [CI] 79% to 100%) and specificity (95% CI 47% to 55%)...AUC" (Explicitly reports sensitivity, specificity, and AUC, fulfilling diagnostic accuracy measures).
2	Yes	Structured abstract with "Study objective," "Methods," "Results," and "Conclusion" sections.
3	Yes	"Background" section explains the clinical role of NGAL for early detection of acute kidney injury compared to serum creatinine.
4	Yes	"Study objective: We assess the diagnostic accuracy of plasma NGAL..." (Clear statement of objectives).
5	Yes	"prospective observational study" (Data collection planned before index test and reference standard).
6	Yes	Inclusion/exclusion criteria listed under "Selection of Participants."
7	Yes	Participants identified based on "suspected infection," "serum lactate >2.5 mmol/L," and systemic inflammatory response syndrome criteria.
8	Yes	"10 academic centers...during an 18-month period" (Setting, location, and dates specified).
9	Yes	"convenience sample of patients" (Explicitly states sampling method).
10a	Yes	Detailed NGAL measurement protocol: blood collection, processing, storage, and analysis with Triage platform.

10b	Yes	Reference standard defined as "increase in serum creatinine >0.5 mg/dL within 72 hours."
11	Yes	Rationale for serum creatinine as the reference standard provided in "Background."
12a	No	NGAL cutoff (>150 ng/mL) determined by ROC curve inspection (exploratory, not pre-specified).
12b	Yes	Pre-specified serum creatinine cutoff (>0.5 mg/dL) based on clinical criteria.
13a	Yes	"blinded to the clinical data" (Index test performers unaware of reference standard results).
13b	No	No mention of whether reference standard assessors were blinded to NGAL results.
14	Yes	"sensitivity, specificity, AUC...95% confidence intervals" (Methods for accuracy estimation described).
15	No	No description of handling indeterminate/missing NGAL or creatinine results.
16	Yes	Excluded patients without follow-up creatinine measurements ("n=227 excluded").
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No stated sample size calculation or power analysis.
19	No	No participant flow diagram in the provided text (may exist in full article).
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity in acute kidney injury patients.
21b	No	No distribution of alternative diagnoses in non-acute kidney injury patients.
22	Yes	"serum creatinine obtained within 12-72 hours" (Time interval specified).
23	No	No cross-tabulation table of NGAL vs. creatinine results in the provided text.
24	Yes	"96% sensitive (95% CI 79%-100%)...specificity 51% (95% CI 47%-55%)" (Precision estimates included).
25	No	No mention of adverse events from NGAL or creatinine testing.
26	Yes	"limitations...preliminary investigation...further research warranted" (Limitations discussed).
27	Yes	"NGAL as a promising biomarker...earlier detection may lead to intervention" (Implications for practice).
28	No	No registration number or registry name provided.
29	No	No mention of study protocol accessibility.
30	Yes	"Biosite Incorporated...role of funders" (Funding sources disclosed).

Parikh 2004

Item No.	Assessment	Support for Assessment
1	Yes	"A conventional receiver operating characteristic (ROC) curve was used to determine the sensitivities and specificities... Area under the curve also was calculated." (Results section).
2	Yes	The abstract includes structured sections: Background, Methods, Results, and Conclusions.

3	Yes	Background describes clinical relevance of ATN diagnosis and states: "The clinical application of this test may be substantial..." (Conclusion).
4	Yes	Hypothesis: "We developed the hypothesis that IL-18 levels are increased in urine in patients with ATN." (Methods).
5	No	No explicit statement on prospective/retrospective data collection. Mentions urine collection after consent but does not clarify timing relative to test planning.
6	Yes	Eligibility criteria defined for all groups (e.g., ATN: oliguria, creatinine >3 mg/dL, specific urine sediment).
7	Yes	Patients identified based on clinical conditions: "patients with ATN were selected from Renal Consult Service... UTI patients from Renal Hypertension Clinic." (Methods).
8	No	Mentions "University Hospital (Denver, CO)" but no dates or duration of participant identification.
9	Partial*	Transplant recipients were "22 consecutive patients," but other groups lack clarity. Overall categorized as No due to incomplete reporting.
10a	Yes	Index test (urinary IL-18) details: ELISA kit, urine processing, normalization to creatinine (Methods).
10b	Yes	Reference standard definitions: ATN based on creatinine, oliguria, and urine sediment (Methods).
11	No	No rationale provided for using clinical criteria (e.g., creatinine, urine sediment) as the reference standard.
12a	No	ROC cutoffs determined post hoc: "ROC curve was used to determine sensitivities and specificities..." (Results). No pre-specified thresholds.
12b	Yes	Reference standard positivity (e.g., ATN diagnosis) was pre-defined in Methods.
13a	No	No mention of blinding; test performers may have had access to clinical data.
13b	No	No mention of blinding for reference standard assessors.
14	Yes	"Sensitivities, specificities, ROC curves, and AUC" reported (Results).
15	No	No description of handling indeterminate results (e.g., missing urine samples).
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy across subgroups.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Tables 1–3 describe demographic/clinical characteristics.
21a	No	Severity distribution (e.g., creatinine levels) in ATN patients reported but not analyzed for diagnostic accuracy impact.
21b	No	Alternative diagnoses (e.g., prerenal azotemia) listed but not systematically compared.
22	No	No time interval reported between index test (urine IL-18) and reference standard (clinical diagnosis).
23	No	No 2x2 contingency table comparing index test vs. reference standard.
24	No	Sensitivity/specificity reported but no confidence intervals (only P-values).
25	No	No adverse events mentioned.
26	Yes	Limitations: "The clinical application... requires validation in larger studies..." (Conclusion).
27	Yes	"Urinary IL-18 may serve as a marker for proximal tubular injury..." (Conclusion).
28	No	No registration number or registry name.

29	No	No mention of protocol availability.
30	Yes	"Supported in part by grants... National Institutes of Health... role of funders" (Footnote).

Xu 2022 Here is the extracted table with the requested columns:

Item No.	Assessment	Support for Assessment
1	Yes	"pooled sensitivity and specificity... AUC of summary receiver operating characteristic" (Explicitly reports diagnostic accuracy measures).
2	Yes	Structured abstract with Background, Methods, Results, Conclusions under "Frontiers in Medicine" formatting.
3	Yes	"NGAL is a sensitive indicator... predictive value of AKI-associated need for RRT needs further evaluation" (Describes clinical role of index test).
4	Yes	"Our findings suggested that NGAL is an effective predictive biomarker" (States study objective).
5	No	No mention of prospective/retrospective data collection planning.
6	Yes	Inclusion/exclusion criteria listed under "Study selection".
7	Yes	"Participants aged ≥18 years... AKI and non-AKI patients with sepsis who underwent RRT".
8	Partial	Mentions "Shenzhen, China" but no specific dates (Insufficient for full "Yes").
9	No	No description of participant selection method (consecutive/random/convenience).
10a	Partial	Mentions "plasma/serum and urine NGAL" but lacks technical replication details.
10b	Yes	"RRT... hemodialysis and peritoneal dialysis" (Reference standard clearly defined).
11	Yes	"RRT... best available method" implied in Background section.
12a	Yes	"NGAL cutoff values... multivariate Cox proportional risk regression model" (Defines test positivity).
12b	Yes	RRT initiation criteria implied through clinical need description.
13a	Unclear	No information about blinding of index test assessors.
13b	Unclear	No information about blinding of reference standard assessors.
14	Yes	"random effects model... calculated sensitivity, specificity, PLR, NLR, DOR".
15	No	No mention of handling indeterminate results.
16	No	No description of missing data handling.
17	No	No variability analyses reported.
18	No	No sample size calculation rationale provided.
19	Yes	"Figure 1: Selection process of included studies" (Flow diagram).
20	Yes	"Baseline demographic... average NOS score of 7.67" (Participant characteristics).
21a	No	No severity distribution in target population.
21b	No	No alternative diagnoses distribution.
22	No	No time interval between NGAL testing and RRT initiation.

23	Yes	"Cross tabulation... TP, FP, TN, FN rates extracted".
24	Yes	"Pooled sensitivity 0.75 (95% CI: 0.68–0.81)... AUC 0.82".
25	No	No adverse events reported.
26	Yes	"Study limitations... need for high-quality evidence".
27	Yes	"NGAL is an effective predictive biomarker... implications for practice".
28	Yes	"CRD42022346595" (PROSPERO registration number).
29	No	No protocol access information.
30	Yes	"Guangdong Provincial Key Laboratory... role of funders".

Peng 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The predictive value of urine CCL2 for AKI was assessed using ROC curve analysis (AUC = 0.8976; $p < 0.0001$)." (Explicit use of AUC as a measure of diagnostic accuracy.)
2	Yes	The abstract includes structured sections: "Background," "Methods," "Results," and "Conclusions," summarizing study design and outcomes.
3	Yes	"Early diagnosis of AKI and SAKI enables timely interventions... urine CCL2 as a diagnostic biomarker for early diagnosis." (Describes clinical role of the index test.)
4	Yes	"This study aimed to investigate the potential of urine CCL2 as a diagnostic biomarker for AKI and SAKI." (Clear objective and hypothesis.)
5	Yes	"This was a prospective study... patient enrollment started from March 2021 to December 2022." (Prospective data collection.)
6	Yes	"Inclusion criteria: age ≥18 years, no CKD... Exclusion criteria: urinary tract infection, prior nephrotoxic drugs." (Explicit eligibility criteria.)
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior test results).
8	Yes	"216 patients admitted to the ICU of the First People's Hospital of Kunshan... from March 2021 to December 2022." (Specifies setting and dates.)
9	No	"When the patient number reached the aimed target in a group, enrollment for that group was ended." (Convenience series, not consecutive/random.)
10a	Yes	"CCL2 levels in urine were measured using ELISA... expressed as ng/mmol creatinine." (Sufficient detail for replication.)
10b	Yes	"AKI was determined using KDIGO criteria... based on SCr levels and urine output." (Reference standard clearly defined.)
11	Yes	KDIGO is the accepted standard for AKI diagnosis, as stated in the Methods.
12a	No	"Youden's index was used to select sensitivity and specificity." (Cut-offs determined post-hoc, not pre-specified.)
12b	Yes	KDIGO criteria for AKI staging (pre-defined SCr thresholds) were used.
13a	No	No information on whether index test performers were blinded to clinical/reference standard data.
13b	No	No information on whether reference standard assessors were blinded to index test results.

14	Yes	"ROC curve analysis... AUC values, sensitivity, specificity, and 95% confidence intervals reported."
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	"Two cases were excluded due to lack of samples," but no further details on missing data methods.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup comparisons).
18	No	"Aimed to recruit around 25 controls and 60–65 per group," but no justification (e.g., power calculation).
19	Yes	"Flow of participants... using a diagram" (mentioned in the supplementary material).
20	Yes	Table 1 summarizes baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity (e.g., AKI stages) in the target condition group.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No mention of time interval between index test (urine CCL2) and reference standard (SCr).
23	No	No cross-tabulation of index test vs. reference standard results (e.g., 2x2 table).
24	Yes	"AUC = 0.8976 (95% CI: 0.85–0.94) for AKI; AUC = 0.7597 (95% CI: 0.68–0.83) for SAKI."
25	No	No mention of adverse events from urine CCL2 testing or reference standard.
26	Yes	"Study limitations include single-center design, lack of external validation, and convenience sampling."
27	Yes	"Urine CCL2 offers insights for timely intervention and improved ICU management." (Implications for practice.)
28	No	No registration number or registry name provided.
29	No	No mention of where the full study protocol can be accessed.
30	No	Funding sources and roles not explicitly stated in the main text or supplementary material.

Li 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity and specificity of uNGAL, uKIM-1, and uAGT in diagnosis and mortality prediction were analyzed by the receiver operator characteristic (ROC) curve and the area under the curve (AUC)." (Abstract)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusion.
3	Yes	Introduction describes clinical challenges in septic AKI diagnosis and the rationale for evaluating uNGAL, uKIM-1, and uAGT.
4	Yes	"This study was conducted to analyze the role... in the early diagnosis and mortality prediction of septic AKI." (Abstract)
5	Yes	"This prospective study enrolled 80 sepsis patients..." (Methods). Data collection timing (0–72 h) specified.
6	Yes	Inclusion/exclusion criteria listed under "Study Subjects" (Sepsis-3, KDIGO, exclusion of malignancies, etc.).
7	Yes	Participants identified based on "symptoms, results from previous tests" (e.g., sepsis diagnosis via SOFA score, PCT levels).
8	Yes	"ICU of Dangyang Renmin Hospital... between January 2022 and December 2022." (Methods)

9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	"Urine samples... analyzed via ELISA with specific kits (ab113326, ab235081, IBL-27412)." (Methods)
10b	No	KDIGO criteria referenced but lacks operational details (e.g., baseline creatinine determination, urine output monitoring frequency).
11	No	No rationale provided for choosing KDIGO over alternative reference standards (e.g., AKIN, RIFLE).
12a	No	Cut-offs determined via ROC analysis (post hoc), not pre-specified. No distinction between pre-specified vs. exploratory.
12b	No	KDIGO criteria used but no explicit mention of pre-specified thresholds or rationale.
13a	Yes	"Experts responsible for analysis were unaware of sample information." (Methods)
13b	No	No information on whether reference standard assessors were blinded to index test results.
14	Yes	"ROC curve... AUC, sensitivity, specificity calculated using MedCalc." (Methods)
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data management (e.g., exclusion, imputation).
17	No	No analysis of variability in diagnostic accuracy across subgroups.
18	No	No sample size justification (e.g., power calculation).
19	Yes	"Fig. (1). Trial design and patient flow diagram." (Methods)
20	Yes	"Demographic and laboratory data of participants" shown in Table 1.
21a	Yes	AKI staging (AKI-1, AKI-2, AKI-3) and biomarker levels compared across stages.
21b	No	Non-AKI group described as sepsis patients without AKI but no distribution of alternative diagnoses.
22	No	No explicit time interval between index test (biomarker measurement) and reference standard (AKI diagnosis).
23	No	No 2x2 contingency table comparing index test results against reference standard.
24	No	AUC values reported but no confidence intervals (e.g., "ROC-AUC: 0.770" without 95% CI).
25	No	No adverse events reported from biomarker testing or reference standard.
26	Yes	Limitations discussed: single-center design, small sample size. (Discussion)
27	Yes	"Their combination helped the early diagnosis and mortality prediction." (Conclusion)
28	No	No registration number or registry name provided.
29	No	No mention of protocol availability.
30	No	No funding sources or sponsor roles declared in the provided text.

Perry 2010

Item No.	Assessment	Support for Assessment
1	Yes	"Area under the curve of receiver operating characteristic curves was analyzed to assess sensitivities, specificities, and cutoff points..." (Explicitly

		reports sensitivity, specificity, and AUC).
2	Yes	Structured abstract includes "BACKGROUND," "METHODS," "RESULTS," and "CONCLUSION" sections.
3	Yes	"The value of early plasma NGAL levels as a predictive marker of postoperative AKI... is not known. Therefore, our aim was to evaluate..." (Describes clinical role of NGAL).
4	Yes	"We hypothesized that increased plasma NGAL... would predict AKI after CABG surgery" (States hypothesis).
5	Yes	"In a retrospective observational study..." (Explicitly states retrospective design).
6	Yes	Exclusion criteria listed: "preoperative renal replacement therapy, off-pump CABG, aprotinin use, missing creatinine/NGAL data."
7	Yes	"Consecutive patients scheduled for primary, CABG-only surgery..." (Basis: surgical eligibility).
8	Yes	"Brigham and Women's Hospital... and Texas Heart Institute... between August 2001 and June 2007" (Setting and dates specified).
9	Yes	"Consecutive patients..." (Consecutive series).
10a	Yes	"Plasma NGAL was measured using Triage® NGAL... with the Triage Meter" (Replicable method).
10b	Yes	"AKI was defined as a ≥50% increase in serum creatinine from preoperative levels" (Clear reference standard).
11	Yes	"To maintain consistency with previously published literature..." (Rationale for creatinine-based reference).
12a	No	NGAL cutoff (353.5 ng/mL) derived from ROC analysis; no pre-specified threshold mentioned.
12b	Yes	AKI definition (≥50% creatinine increase) was pre-specified as per prior literature.
13a	Unclear	No explicit statement on blinding of index test assessors to reference standard results.
13b	Unclear	No explicit statement on blinding of reference standard assessors to index test results.
14	Yes	"Multivariable logistic regression... ROC curves... sensitivity, specificity, AUC" (Methods for accuracy measures).
15	No	No mention of handling indeterminate/missing NGAL or creatinine results.
16	No	No description of handling missing data beyond exclusion criteria.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram included.
20	Yes	Table 1 lists "Baseline demographic and clinical characteristics."
21a	No	No distribution of disease severity in AKI patients (e.g., AKI staging).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Blood samples taken "immediately after separation from CPB" (Time interval specified).
23	Yes	Cross-tabulation implied by sensitivity/specificity calculations (2x2 table).
24	Yes	"Sensitivity 38.7%, specificity 81.5%, AUC 0.641, 95% CI for OR."
25	No	No adverse events from NGAL testing reported.
26	Yes	"Limitations include low sensitivity... delayed creatinine peaks" (Study limitations discussed).
27	Yes	"Assessing early plasma NGAL alone has limited utility..." (Implications for practice).

28	Yes	"ClinicalTrials.gov NCT00281164" (Registration number provided).
29	No	No link or reference to full study protocol.
30	Yes	"Dr. Body received in-kind research support from Biosite..." (Funding sources disclosed).

Obata 2021

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver-operating characteristic curves (ROCs) were plotted to identify cut-off biomarker levels best predictive of the occurrence of OSR-associated AKI." (Statistical analysis section). Mentions AUC and diagnostic accuracy measures.
2	Yes	Structured abstract includes "Purpose," "Patients and Methods," "Results," and "Conclusion."
3	Yes	"Reliable biomarker for early detection of OSR-related AKI and for prediction of chronic renal dysfunction after OSR is needed." (Introduction). Describes clinical role of biomarkers.
4	Yes	"We conducted a study to determine the clinical utility of measuring urinary biomarkers...for early detection of OSR-related AKI." (Introduction). Clear objectives.
5	Yes	"The study was conducted prospectively in a university hospital setting." (Methods).
6	Yes	"Excluded from the study were patients undergoing dialysis or requiring emergency surgery." (Methods).
7	Yes	"Consecutive patients scheduled for OSR (n=64) between October 2011 and May 2017 were enrolled." (Methods). Basis: surgical indication.
8	Yes	"Conducted prospectively in a university hospital setting...between October 2011 and May 2017." (Methods).
9	Yes	"Consecutive patients scheduled for OSR...were enrolled." (Methods).
10a	Yes	"Urine samples...were obtained...for measurement of urinary L-FABP, NGAL, albumin, and Cr. Assays: ELISA for L-FABP and NGAL, immunonephelometry for albumin." (Methods). Replicable details.
10b	Yes	"AKI was defined according to KDIGO criteria...based on serum Cr increase within 48 hours." (Methods). Reference standard defined.
11	No	No explicit rationale provided for choosing KDIGO over alternative criteria.
12a	No	ROC curves used to determine cut-offs but no distinction between pre-specified vs. exploratory.
12b	Yes	KDIGO criteria use pre-specified thresholds (e.g., "≥0.3 mg/dL increase in serum Cr").
13a	No	No information on whether clinical data/reference results were available to biomarker assessors.
13b	No	No information on whether biomarker results were available to AKI assessors.
14	Yes	"ROCs were plotted...AUC...sensitivity and specificity." (Methods).
15	No	No mention of indeterminate results or handling methods.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.

18	No	No sample size justification or power calculation.
19	No	Text describes participant flow but no diagram provided.
20	Yes	Table 1 lists baseline demographics and clinical characteristics.
21a	No	All AKI cases were stage 1; no distribution of disease severity.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	"Serum Cr levels increased significantly immediately after OSR...measured up to POD 3." Time intervals specified.
23	No	No cross-tabulation (2x2 table) of biomarker results vs. KDIGO diagnosis.
24	No	AUC reported but no confidence intervals for sensitivity/specificity.
25	No	No mention of adverse events from biomarker testing.
26	Yes	"This study has some limitations...single-center study with small sample size." (Discussion).
27	Yes	"Urinary L-FABP...may be useful for early detection...predictive of chronic renal dysfunction." (Conclusion).
28	Yes	"Registered in the UMIN Clinical Data Registry (ID 000006584, 000026215)." (Methods).
29	No	No statement on protocol accessibility.
30	Yes	"This study was supported in part by JSPS KAKENHI (grant number: 18K08854)." (Funding section).

Nisula 2015

Item No.	Assessment	Support for Assessment
1	Yes	"We calculated areas under receiver operating characteristics curves (AUCs), best cut-off values, and positive likelihood ratios (LR+)" (Methods). Explicit use of diagnostic accuracy metrics.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background discusses AKI diagnosis limitations and IL-18's proposed role as a biomarker.
4	Yes	"We hypothesized that IL-18 would bring additional benefit to prediction of these outcomes" (Methods).
5	Yes	"Prospective, observational, multicentre FINNAKI study" (Methods). Prospective design confirmed.
6	Yes	Inclusion/exclusion criteria listed under "Patients" (e.g., age >18, exclusion of chronic dialysis).
7	Yes	"Consecutive emergency ICU admissions and postoperative patients admitted for >24 h" (Methods).
8	Yes	"Multicentre FINNAKI study" across Finnish hospitals (Sep 1–Dec 1, 2011) (Methods).
9	Yes	"Convenience sample of patients" explicitly stated (Methods).
10a	Yes	IL-18 assay details: ELISA kit, storage conditions, measurable range (Methods).
10b	Yes	Reference standard: KDIGO criteria with creatinine/urine output (Definitions).
11	No	No rationale provided for choosing KDIGO over other AKI criteria.

12a	No	Cut-offs determined post hoc via Youden index; no pre-specified thresholds mentioned.
12b	No	KDIGO criteria used but no rationale for pre-specified cut-offs.
13a	Yes	"Blinded to patient data" during IL-18 analysis (Methods).
13b	No	Unclear if KDIGO assessors were blinded to IL-18 results.
14	Yes	"AUCs, sensitivity, specificity, LR+ calculated" (Statistical analyses).
15	No	No mention of handling indeterminate/missing IL-18 or KDIGO results.
16	No	Excluded patients with missing 24 h samples but no explicit missing data protocol.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses).
18	No	"Convenience sample" used; no sample size calculation described.
19	Yes	Flowchart provided (Figure 1).
20	Yes	Baseline demographics/clinical characteristics in Table 1.
21a	Yes	AKI severity distribution by KDIGO stages reported (Results).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between IL-18 sampling and KDIGO assessment not explicitly addressed.
23	No	No 2x2 contingency table for IL-18 vs. KDIGO results.
24	Yes	AUCs with 95% CIs reported for all endpoints (Results).
25	No	No adverse events from IL-18 testing mentioned.
26	Yes	Limitations discussed: weak associations, generalizability concerns (Discussion).
27	Yes	"IL-18 should be used with caution" (Conclusions). Clinical implications stated.
28	No	No registration number or registry name provided.
29	No	Full study protocol accessibility not mentioned.
30	Yes	Funding sources acknowledged (Finnish Intensive Care Consortium, others).

Cuartero 2019

Item No.	Assessment	Support for Assessment
1	Yes	"ROC curve analysis... AUROC... sensitivity 76.7%, specificity 78.9%" (Results section). Explicit use of diagnostic accuracy measures.
2	Yes	Abstract includes structured sections: Purpose, Methods, Results, Conclusions.
3	Yes	Introduction explains AKI's clinical significance and NGAL's role as an early biomarker compared to creatinine.
4	Yes	Objectives stated: "To evaluate... wbNGAL to predict AKI development and... analyse the effect of sepsis" (Introduction).
5	Yes	"The study prospectively included 100 patients" (Methods). Prospective design confirmed.
6	Yes	Inclusion/exclusion criteria detailed: age >18, ICU stay ≥48h, exclusion of CKD, etc. (Methods).

7	Yes	Participants identified based on ICU admission criteria (Methods: "consecutively admitted... inclusion/exclusion criteria").
8	Yes	"Hospital de la Santa Creu i Sant Pau... June 2010-February 2011" (Methods).
9	Yes	"100 consecutively admitted patients" (Methods). Consecutive enrollment stated.
10a	Yes	"EDTA-anticoagulated whole-blood using the Triage® NGAL Test" (Methods). Sufficient detail for replication.
10b	Yes	Reference standard: AKIN/KDIGO classifications using serum creatinine and urine output (Methods).
11	No	No explicit rationale for choosing AKIN/KDIGO as reference standard, though they are standard criteria.
12a	No	Cut-off (178 µg/L) derived from ROC analysis; no pre-specified threshold mentioned.
12b	Yes	AKIN/KDIGO stages use predefined criteria (e.g., serum creatinine changes and urine output).
13a	No	No information on whether clinical data or reference results were available to NGAL test performers.
13b	No	"Physicians... blinded to NGAL results" (Methods). Reference assessors had no access to index test results.
14	Yes	"ROC curve analysis... AUROC, sensitivity, specificity" (Methods/Results).
15	No	No mention of indeterminate results or how they were handled.
16	No	Missing data (e.g., 10 patients not completing 48h) reported but no explicit handling method described.
17	No	No analysis of variability in accuracy (e.g., subgroup variability beyond sepsis comparison).
18	No	No sample size justification or power calculation provided.
19	Yes	Figure 1 includes a participant flow diagram.
20	Yes	Table 1 reports demographics, clinical scores, and outcomes.
21a	Yes	AKI severity distribution by stage (e.g., stage 1-3) reported in Results and Figure 2.
21b	No	No distribution of alternative diagnoses in non-AKI patients (e.g., sepsis vs. non-sepsis).
22	No	Time interval between index test (wbNGAL) and reference standard assessment not explicitly stated.
23	No	No cross-tabulation of index vs. reference results in main text (Supplemental Table 1 not shown).
24	Yes	"AUROC 0.838 (95% CI 0.76-0.92)" and specificity/sensitivity reported (Results).
25	No	No mention of adverse events related to wbNGAL or reference tests.
26	Yes	Limitations discussed: NGAL's elevation in sepsis regardless of AKI (Conclusions).
27	Yes	Conclusion states wbNGAL's potential role in AKI stratification with sepsis caveats.
28	No	No registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	No	Funding sources and roles not disclosed in the provided text.

Hatton 2020

Item	Assessment	Support for Assessment

No.		
1	Yes	"Using the optimal threshold 0.33 units to predict AKI, the area under the ROC curve was 0.731, with an accuracy of 0.75, sensitivity of 0.72, and specificity of 0.78." Explicitly reports AUC, sensitivity, and specificity as measures of diagnostic accuracy.
2	Yes	Abstract includes structured sections: Background, Methods, Main Results, and Conclusion.
3	Yes	Introduction discusses the clinical challenge of diagnosing AKI in trauma patients and the intended use of TIMP-2*IGFBP-7 as an early biomarker.
4	Yes	"We hypothesized that Urinary TIMP-2*IGFBP-7 would accurately predict AKI development in severely injured trauma patients."
5	Yes	"A prospective observational study... Urine was collected on ICU admission." Data collection was planned prospectively.
6	Yes	"Inclusion criteria: adult trauma ICU patients... excluded pregnant women and prisoners."
7	Yes	Eligibility based on "highest-level trauma activation" criteria (e.g., vital signs, injury type).
8	Yes	"Memorial Hermann Hospital Texas Medical Center... between September 2018 and March 2019."
9	No	No explicit mention of consecutive, random, or convenience sampling. Described as "opportunistic prospective study," suggesting convenience sampling.
10a	Yes	Detailed methods for urine collection, storage, and measurement using NephroCheck®.
10b	Yes	AKI defined by KDIGO guidelines with serum creatinine, urine output, and dialysis criteria.
11	Yes	KDIGO guidelines cited as the reference standard; rationale implied by its widespread clinical use.
12a	No	Threshold (0.33 units) derived post hoc via Youden index; no pre-specified cut-off mentioned.
12b	Yes	KDIGO criteria for AKI staging are pre-specified and standardized.
13a	Yes	"The results [of TIMP-2*IGFBP-7] were not made available to clinicians," implying reference standard assessors were blinded.
13b	Yes	AKI diagnosis relied on objective lab values (creatinine, urine output), independent of index test results.
14	Yes	"ROC curve analyses... multivariable logistic regression... Youden index."
15	No	No mention of handling indeterminate index test or reference standard results.
16	Yes	"There were no missing data."
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	Sample size calculation described with power analysis and expected AUC.
19	No	No participant flow diagram provided.
20	Yes	Table 1 reports demographics, injury severity, and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., stages 1–3) among those with the target condition.
21b	No	No distribution of alternative diagnoses in patients without AKI.
22	No	Time interval between index test (ICU admission) and reference standard (48-hour AKI) not explicitly stated.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC = 0.73, 95% CI 0.65–0.84," sensitivity, specificity, and accuracy reported.
25	No	No mention of adverse events from testing.

26	Yes	Limitations include small sample size and single-center design.
27	Yes	Conclusion states TIMP-2*IGFBP-7 is a "promising screening tool for treatment."
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	"HHS Public Access" and funding statement under "Conflicts of Interest" section.

Pei 2022

Item No.	Assessment	Support for Assessment
1	Yes	"The areas under the receiver operating curves demonstrated that serum cystatin C had modest discriminative powers for predicting AKI after sepsis..." (AUC mentioned)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusion.
3	Yes	"Current diagnostic criteria for AKI was insensitive for early detection... We aimed to determine the diagnostic performance of these biomarkers." (Background and clinical role described)
4	Yes	"We aimed to determine the diagnostic performance of these biomarkers..." (Clear objective)
5	Yes	"This prospective observational study..." (Prospective design)
6	Yes	Exclusion criteria listed: age <18, CKD stages 3-5, etc.
7	Yes	"Enrolling 162 sepsis patients..." (Based on sepsis diagnosis)
8	Yes	"Conducted in Peking University People's Hospital... between May 2018 and November 2020."
9	Yes	"195 consecutive patients were screened."
10a	Yes	"ELISA kits from Abcam, Sigma, R&D Systems... detailed in Methods."
10b	Yes	"AKI was defined in accordance with 2012 KDIGO criteria."
11	No	No rationale provided for choosing KDIGO over alternatives.
12a	No	Cut-offs determined post-hoc via Youden index; not pre-specified.
12b	Yes	KDIGO criteria use pre-specified thresholds (e.g., SCr ≥0.3 mg/dL).
13a	No	"Laboratory investigators were blind to clinical information." (Index test blinded to reference)
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	"ROC analysis... AUROC calculated."
15	No	No mention of handling indeterminate results.
16	No	Exclusion criteria described, but no explicit handling of missing data.
17	No	No analysis of variability in diagnostic accuracy.

18	No	No sample size calculation or justification provided.
19	No	Text describes flow but lacks a diagram.
20	Yes	Table 1 lists demographic and clinical characteristics.
21a	No	AKI stages reported but no distribution of severity (e.g., by KDIGO stage).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Biomarkers measured at admission; SCr monitored for 7 days.
23	No	No cross-tabulation (2x2 table) of index vs. reference results.
24	No	AUCs reported without 95% confidence intervals.
25	No	No adverse events mentioned.
26	Yes	"Study limitations... single-center, small sample size."
27	Yes	"Cystatin C... may accurately and sensitively predict septic AKI." (Implications for practice)
28	No	No registration number or registry name provided.
29	No	No protocol accessibility statement.
30	No	Funding sources mentioned in the original article's footer but not in the provided text.

Ueta 2014

Item No.	Assessment	Support for Assessment
1	Yes	"NGAL/Cr values demonstrated the best predictive value for AKI (97% specificity, 83% sensitivity at a 65.1 µg/gCr cutoff). The area under the receiver-operator characteristic curve [...] was 0.9." (Results). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background describes AKI's clinical impact, limitations of sCr, and the intended role of novel biomarkers for early AKI detection.
4	Yes	"We wanted to find out whether some biomarkers were capable of early detection of AKI" (Background). Explicit hypothesis stated.
5	Yes	"prospective observational study" (Abstract), with planned data collection before biomarker and sCr measurements.
6	Yes	Exclusion criteria: "pre-existing renal failure (sCr >3 mg/dL), renal replacement therapy" (Methods).
7	Yes	Participants identified based on undergoing endovascular stent graft repair for aortic aneurysm (Methods).
8	Yes	"Osaka University Medical School [...] from December 2010 to March 2011" (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling. States "prospectively enrolled" but does not clarify recruitment method.
10a	Yes	Detailed descriptions of biomarker assays (e.g., "chemiluminescent immunoassay," ELISA kits, normalization to urine creatinine) (Methods).
10b	Yes	Reference standard: AKIN sCr criteria ("stage 1, sCr rising to >0.3 mg/dL or 50% over baseline") (Methods).
11	No	No rationale provided for choosing AKIN criteria over alternatives (e.g., KDIGO).

12a	No	Cutoffs (e.g., 65.1 µg/gCr for NGAL/Cr) were determined post hoc via ROC analysis; not pre-specified (Results).
12b	Yes	AKIN criteria for sCr were pre-defined as the reference standard (Methods).
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curves [...] generated for each biomarker," "univariable logistic regression," and DeLong's method for AUC comparisons (Methods).
15	Yes	Excluded patients with urinary tract infections affecting NGAL levels: "4 owing to urinary tract infection" (Results).
16	Yes	"1 [patient] excluded owing to incomplete data" (Results).
17	No	No analysis of variability in diagnostic accuracy across subgroups or pre-specified vs. exploratory analyses.
18	No	No mention of sample size calculation or justification.
19	No	No participant flow diagram; text describes exclusions but no visual summary.
20	Yes	Table 1 provides demographics (age, sex, comorbidities) and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., stages 1–3) beyond stating "5 stage 1, 1 stage 2."
21b	No	No description of alternative diagnoses in non-AKI patients.
22	Yes	Sampling times specified: "2 to 6 h, 1, 3–4, and 5 days or later after surgery" (Methods).
23	No	No 2x2 table cross-tabulating index test results against reference standard.
24	Yes	"Sensitivity, specificity, AUC (0.9), and 95% confidence intervals" reported (Results).
25	Yes	"None of the enrolled patients required dialysis or died within 30 days" (Results).
26	Yes	Limitations: small sample size, single-center design, lack of urine output criteria (Discussion).
27	Yes	"NGAL/Cr is a potentially useful early biomarker for AKI" (Conclusions).
28	No	No registration number or registry name provided.
29	No	No statement on protocol availability.
30	Yes	Funding: "This is an Open Access article [...] Creative Commons Attribution License" (Background).

Waskowski 2021

Item No.	Assessment	Support for Assessment
1	Yes	"Secondary endpoints included sensitivity/ specificity analyses of previously proposed cut-off levels" (Abstract). The study explicitly reports sensitivity/specificity as measures of diagnostic accuracy.
2	Yes	The abstract includes structured sections: Objective, Methods, Results, Conclusions.
3	Yes	The Introduction describes AKI's clinical impact and the role of TIMP-2/IGFBP7 for early detection.
4	Yes	"Objective: We investigated whether biomarker-based monitoring would allow for early detection of po-AKI" (Abstract).

5	Yes	"Prospective observational study" (Methods). Data collection was planned before index/reference tests.
6	Yes	Inclusion/exclusion criteria listed under "Study characteristics and study patients."
7	Yes	"Patients with emergency or elective abdominal aortic surgery" (Methods). Eligibility based on surgical procedure.
8	Yes	"Single center... performed from June 2018 to September 2019" (Methods).
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	Detailed description of urinary (TIMP-2)x(IGFBP7) measurement using NephroCheck assay (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI ("defined along KDIGO definitions, stages 1–3").
11	No	No explicit rationale for choosing KDIGO over alternative criteria.
12a	Yes	Pre-specified cutoffs (0.3 and 2) were evaluated: "previously proposed cutoff levels" (Abstract).
12b	Yes	KDIGO stages (pre-specified) used to categorize AKI severity.
13a	No	Unclear whether clinicians assessing biomarkers were blinded to reference standard results.
13b	No	Unclear whether KDIGO assessors were blinded to biomarker results.
14	Yes	"Sensitivity/specificity analyses" and AUROC reported (Abstract/Results).
15	No	No description of handling indeterminate biomarker/KDIGO results.
16	No	Missing data handling not addressed.
17	No	No analysis of variability in diagnostic accuracy.
18	Yes	Sample size calculation based on expected AKI incidence (Methods).
19	No	No participant flow diagram.
20	Yes	Baseline demographics/clinical characteristics in Table 1 (Results).
21a	No	No distribution of disease severity (e.g., AKI stages) beyond KDIGO classification.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Biomarker measurements timed at baseline, PO, and POD1; AKI assessed within 7 days (Methods).
23	Yes	Cross-tabulation of biomarker results vs. KDIGO stages in Table 2/Fig 2.
24	No	Sensitivity/specificity reported, but no confidence intervals for accuracy estimates.
25	No	Adverse events from biomarker testing not mentioned.
26	Yes	Limitations discussed: "moderate sensitivity/specificity," single-center design (Conclusion).
27	Yes	Conclusion states implications for clinical use of the biomarker.
28	Yes	Registration number: NCT03469765 (Abstract).
29	No	No statement about protocol accessibility.
30	Yes	Funding sources and conflicts of interest declared (Funding/Competing Interests).

Salmito 2024

Item No.	Assessment	Support for Assessment
1	Yes	"Logistic regression models, receiver operating characteristic (ROC) curves, continuous net reclassification improvement (NRI) and integrated discrimination improvement (IDI) were used for analysis... The area under the ROC curve (AUC-ROC) for AGPT2 and syndecan-1 performed better..." (Methods and Results sections describe diagnostic accuracy measures).
2	Yes	Abstract includes structured sections: background, methods, results, and conclusions.
3	Yes	"Scientific and clinical background" provided in the introduction, including the role of biomarkers in predicting KST need.
4	Yes	"This study aimed to analyze endothelium-related biomarkers as predictors of KST need..." (explicit objective stated in the abstract).
5	Yes	"A prospective observational study was conducted..." (Methods section specifies prospective design).
6	Yes	Inclusion and exclusion criteria detailed under "Patient selection."
7	Yes	Participants identified based on "stage 2 AKI by serum creatinine only" (Methods).
8	Yes	"Performed at a hospital unit... between November 2021 and November 2022" (Methods).
9	No	No explicit mention of consecutive, random, or convenience enrollment.
10a	Yes	Biomarker measurement methods (ELISA kits, intra-assay CVs) described under "Biomarker measurement."
10b	Yes	KST initiation criteria (e.g., hyperkalemia, acidosis) defined under "Outcomes."
11	Yes	Rationale for KST as the reference standard explained in the introduction (e.g., life-threatening complications).
12a	No	No pre-specified cut-offs for biomarkers; analysis used ROC-derived thresholds.
12b	Yes	KST initiation is a binary outcome (yes/no) defined by clinical criteria.
13a	No	No mention of blinding or whether index test performers had access to clinical information.
13b	No	No mention of whether clinicians assessing KST had access to biomarker results.
14	Yes	"Logistic regression models, ROC curves, NRI, IDI" described in statistical analysis.
15	No	No discussion of indeterminate results handling.
16	No	No mention of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroups).
18	No	No sample size justification or power calculation provided.
19	Yes	Participant flow diagram (Fig. 1) included.
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	No distribution of disease severity in patients requiring KST.
21b	No	No distribution of alternative diagnoses in non-KST patients.
22	Yes	Time interval specified: biomarkers measured at AKI stage 2, KST assessed within 72h.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	AUC with 95% CIs, NRI, and IDI reported in Results.

25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed (e.g., single-center, small sample) in the Discussion.
27	Yes	Implications for early KST identification stated in the Conclusion.
28	No	No trial registration number provided.
29	No	No mention of study protocol availability.
30	No	Funding sources not explicitly stated; "Competing interests" declared as none.

Srisawat 2015

Item No.	Assessment	Support for Assessment
1	Yes	"uNGAL and pNGAL levels associated with AKI had AUC-ROC of 0.91, and 0.92, respectively" (Abstract). Explicitly reports AUC-ROC as a measure of diagnostic accuracy.
2	Yes	Abstract includes structured sections: objectives ("aimed to study the role of NGAL"), methods ("prospectively enrolled"), results ("Median uNGAL...p < 0.001"), and conclusions ("promising result to be a marker").
3	Yes	Introduction describes NGAL's role as an AKI biomarker and its clinical utility for early triage and intervention: "Benefits from biomarkers...preventing AKI progression" (Introduction).
4	Yes	Objectives stated: "to study the role of NGAL as an early marker and an outcome predictor of leptospirosis associated AKI" (Abstract).
5	Yes	"prospective observational study" with samples collected serially after enrollment (Methods). Confirms prospective data collection.
6	Yes	Inclusion/exclusion criteria: "high fever...history of exposure to reservoir animals" and excluded "known other infectious disease" (Methods).
7	Yes	Eligibility based on symptoms: "clinical suspicion of leptospirosis" including fever, myalgia, and exposure history (Methods).
8	Yes	"conducted in 9 centers...August 2012 to November 2014" (Methods). Specifies setting and timeframe.
9	No	No explicit statement on whether participants were consecutive, random, or convenience series.
10a	Yes	NGAL measurement details: "uNGAL was measured by ELISA...pNGAL tested using Triage NGAL kit" (Methods). Replicable methodology.
10b	Yes	Reference standard: "KDIGO criteria...serum creatinine criteria" (Methods). Clear replication details.
11	Yes	Rationale for KDIGO: "used...as AKI diagnosis" due to urine output data limitations (Methods).
12a	No	No pre-specified positivity cut-offs for NGAL reported; exploratory analysis implied by ROC curves.
12b	Yes	KDIGO criteria defined a priori: "KDIGO stage...based on serum creatinine" (Methods). Pre-specified thresholds.
13a	Unclear	Not explicitly stated whether reference standard results were available to NGAL testers. Assumed "No" due to lack of description.
13b	Unclear	Similarly, no explicit information on whether NGAL results influenced reference standard assessors. Assumed "No".
14	Yes	"ROC curves...AUC calculated" (Methods). Appropriate accuracy estimation methods.
15	No	No description of handling indeterminate index/reference test results (e.g., missing NGAL values).

16	No	Excluded 15 cases due to missing samples/AKI status but no explicit missing data handling protocol (Fig 1).
17	No	No variability analyses (e.g., subgroup analyses or precision assessments beyond confidence intervals).
18	No	No sample size calculation or power analysis mentioned.
19	Yes	Participant flow diagram provided (Fig 1).
20	Yes	Table 1 reports demographics, clinical characteristics (e.g., age, blood pressure, lab values).
21a	No	No distribution of disease severity in AKI patients (e.g., staging beyond KDIGO).
21b	No	No alternative diagnoses reported for non-AKI/non-leptospirosis cases.
22	Yes	Time interval: Samples collected on days 1-3 and 7; reference standard applied during hospitalization (Methods).
23	Yes	Cross-tabulation implied by AUC calculations and comparisons of NGAL levels between AKI/non-AKI groups (Results).
24	Yes	"AUC-ROC of 0.91...0.92" with p-values (Abstract/Results). Includes precision estimates (e.g., confidence intervals in regression models).
25	No	No adverse events from NGAL testing or reference standard reported.
26	Yes	Limitations: Small sample size, single biomarker timing, lack of urine output data (Discussion).
27	Yes	"NGAL provided promising results...but did not predict recovery" (Abstract). Discusses clinical implications.
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	Funding: "Jongkolneenithi foundation" and competing interests declared (Financial Disclosure).

Doi 2013

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver operating characteristics analysis revealed different cutoff values of AKI for CKD and non-CKD patients." (Explicit use of ROC analysis and AUC values.)
2	Yes	Abstract includes structured sections: Introduction, Methods, Results, Conclusions.
3	Yes	"Plasma NGAL... is reportedly useful for post-cardiac surgery acute kidney injury (AKI)... this study evaluated plasma NGAL in AKI superimposed on CKD." (Background and intended use of the index test.)
4	Yes	"This study evaluated plasma NGAL in AKI superimposed on CKD after cardiac surgery." (Clear objective and hypothesis implied.)
5	Yes	"This study prospectively evaluated 146 adult patients." (Prospective data collection stated.)
6	Yes	"Patients with end-stage renal disease or a renal transplant were excluded." (Eligibility criteria provided.)
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior tests).
8	Yes	"146 adult patients undergoing scheduled cardiac surgery at Tokyo University Hospital and Itabashi Chuo Medical Center." (Setting and locations specified.)

9	No	No mention of whether participants were consecutive, random, or a convenience series.
10a	Yes	"Plasma NGAL was measured... using an NGAL test (Triage; Alere Medical Inc.)." (Detailed index test methodology.)
10b	Yes	AKI diagnosis via KDIGO/AKIN criteria (serum creatinine changes). (Reference standard defined.)
11	Yes	"The reference standard... best available method for establishing presence/absence of target condition." (Implied rationale for using serum creatinine as reference.)
12a	Yes	"Optimal cutoff values were determined using the Youden index." (Rationale for test positivity cut-offs.)
12b	No	No explicit rationale for reference standard cut-offs (e.g., why AKIN criteria were chosen).
13a	Unclear	Not explicitly stated whether index test readers had access to clinical/reference standard data.
13b	Unclear	Not explicitly stated whether reference standard assessors had access to index test results.
14	Yes	"Receiver operating characteristic (ROC) curve analysis... sensitivity, specificity, AUC." (Methods for accuracy estimation.)
15	No	No description of handling indeterminate index test or reference standard results.
16	No	No mention of missing data handling for index/reference tests.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup variability).
18	Yes	"A sample size of 129 patients... estimated to detect AUC-ROC difference." (Sample size justification.)
19	No	No participant flow diagram provided.
20	Yes	Table 1 lists baseline demographics and clinical characteristics.
21a	No	No distribution of disease severity in AKI patients (e.g., AKIN stages only).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	"Blood samples obtained before surgery and at 0, 2, 4, 12, 24, 36, 60h after ICU arrival." (Time interval specified.)
23	Yes	Cross-tabulation implied via ROC analysis comparing NGAL with AKIN criteria.
24	Yes	"AUC-ROC of 0.65 vs. 0.50... 95% confidence intervals." (Accuracy estimates with precision.)
25	No	No mention of adverse events from NGAL or creatinine testing.
26	Yes	"Study limitations... small number of patients." (Limitations discussed.)
27	Yes	"Different cutoff values... necessary to detect AKI superimposed on CKD." (Implications for clinical use.)
28	No	No registration number or registry name provided.
29	No	No statement about full study protocol accessibility.
30	Yes	"Sources of funding... Creative Commons Attribution License." (Funding and support disclosed.)

Chun 2018

Item No.	Assessment	Support for Assessment

1	Yes	"to estimate the diagnostic accuracy of plasma NGAL for early detection of AKI and prediction of mortality" (Objectives) and ROC/AUC analysis in Results. Explicitly mentions diagnostic accuracy measures.
2	Yes	Abstract includes structured sections: background, objectives, methods, results, conclusions. Matches STARD for Abstracts guidance.
3	Yes	Background describes NGAL's role in AKI detection and limitations in burn patients. States the clinical role of NGAL as a biomarker.
4	Yes	"This study had the following purposes..." explicitly lists objectives and hypotheses.
5	Yes	"prospective cohort study" (Methods). Data collection planned before index test and reference standard.
6	Yes	Inclusion/exclusion criteria detailed under "Patient Selection and Data Collection."
7	No	No explicit description of how participants were identified (e.g., symptoms, prior tests). Only states "consecutive patients."
8	Yes	"Hangang Sacred Heart Hospital" and "January 2014 to September 2015" (Methods).
9	Yes	"76 consecutive patients" (Methods).
10a	Yes	NGAL measurement details: "Triage NGAL reagent and Triage Meter" (Methods).
10b	Yes	Reference standard: AKI Network criteria with creatinine definitions (Methods).
11	No	No rationale provided for choosing AKI Network criteria over alternatives.
12a	No	Cutoffs determined post hoc using Youden's index; no pre-specified rationale.
12b	Yes	AKI positivity defined by pre-specified AKI Network criteria.
13a	No	Unclear if reference standard results were blinded to NGAL assessors.
13b	No	Unclear if NGAL results were blinded to AKI assessors.
14	Yes	ROC curves, AUC, and statistical methods described (Methods/Results).
15	No	No mention of handling indeterminate NGAL or AKI results.
16	No	No description of missing data handling.
17	No	No analysis of variability in accuracy measures.
18	No	No sample size justification or power calculation.
19	No	No participant flow diagram.
20	Yes	Table 1 reports demographics and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between NGAL tests and AKI diagnosis not explicitly addressed.
23	No	No cross-tabulation (2x2 table) of NGAL vs. AKI results.
24	No	AUC reported but no confidence intervals for accuracy estimates.
25	No	No adverse events mentioned.
26	Yes	Limitations: NGAL influenced by inflammation, not independent predictor (Discussion).
27	Yes	"Plasma NGAL should be interpreted carefully..." (Conclusion).

28	No	No registration number or registry name.
29	No	No protocol accessibility statement.
30	Yes	Funding sources disclosed (Hallym University, Korean Ministry of Health).

Berlin 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The primary outcome was the association between renal biomarker levels... and the development of KDIGO stage III AKI... The secondary outcomes included the performance of these biomarkers in predicting future AKI development... ROC curves... were used." (Explicitly evaluates diagnostic accuracy using ROC/AUC.)
2	Yes	Abstract includes structured sections: Aim, Methods, Results, Conclusion.
3	Yes	"Early detection of AKI is important... Serum creatinine... has limitations... NGAL, KIM-1, and cystatin-C... may allow earlier detection." (Describes clinical role and intended use of biomarkers.)
4	Yes	"This study aimed to evaluate... biomarkers... in predicting... AKI... We hypothesized... biomarkers... would better predict AKI compared to creatinine." (States objectives and hypotheses.)
5	No	Retrospective analysis of stored samples from prior trials; no explicit statement on prospective data collection planning.
6	Yes	"Inclusion/exclusion criteria... listed in Table S1... Adult CA patients... excluded if ESRD, prior RRT, or insufficient plasma." (Eligibility criteria defined.)
7	Yes	"Adult CA patients who had plasma collected within 12 hours of ROSC" (Identified based on post-arrest clinical event).
8	Yes	"Studies conducted... at Beth Israel Deaconess Medical Center... between January 2008 and October 2021." (Setting, location, dates specified.)
9	No	No description of whether participants were consecutive, random, or convenience series.
10a	Yes	"Plasma levels of Cystatin-C, KIM-1, and NAGL were tested using R-PLEX Assay kits... LLODs specified." (Index test details for replication.)
10b	Yes	"KDIGO stage III AKI defined by creatinine/UOP criteria... Reference standard methods explicitly described."
11	Yes	"KDIGO criteria... best available method for AKI diagnosis." (Rationale for reference standard implied.)
12a	Yes	"Liu's index was used to derive cut points... for sensitivity/specificity analysis." (Cut-offs defined post-hoc but reported.)
12b	Yes	KDIGO criteria pre-specified (established guidelines).
13a	Unclear	No explicit statement on whether reference standard results were available to index test assessors.
13b	Unclear	No explicit statement on whether index test results influenced reference standard assessment.
14	Yes	"ROC curves... tests of equality of ROC areas... Liu's index for cut-offs." (Methods for accuracy measures described.)
15	No	No mention of handling indeterminate index/reference test results.
16	No	No description of handling missing data.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).

18	Yes	"Sample size calculation based on pilot data... 141 patients required for 80% power."
19	Yes	Figure 1: Flow diagram of participant inclusion/exclusion.
20	Yes	Table 1: Baseline demographics and clinical characteristics reported.
21a	No	No distribution of disease severity in AKI patients (only AKI vs. non-AKI groups).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Biomarkers measured within 12h of ROSC; AKI assessed within 7 days. (Time interval addressed.)
23	Yes	Cross-tabulation implied in ROC analysis and biomarker comparisons (e.g., Table 1/Figure 2).
24	Yes	"AUC values... p<0.01 for NGAL, cystatin-C vs. KIM-1." (Estimates with statistical precision.)
25	No	No mention of adverse events from biomarker testing.
26	Yes	"Study limitations... small sample size, single-center design... generalizability limited."
27	Yes	"No biomarker outperformed creatinine... implications for clinical use discussed."
28	No	No registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	Yes	"Sources of funding... HHS Public Access... Conflicts of Interest declared."

Ni 2023

Item No.	Assessment	Support for Assessment
1	Yes	"the sensitivity and specificity of the three indicators of 28-day survival were 87.50% and 66.67%, respectively" and "ROC curve analysis... AUC for serum Cystatin-C... was 0.74" (Abstract and Results). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Structured abstract includes "OBJECTIVE," "PATIENTS AND METHODS," "RESULTS," and "CONCLUSIONS" (Abstract). Matches STARD guidance for structured summaries.
3	No	Focuses on prognostic risk factors (e.g., APACHE II, lactate) rather than the clinical role/use of a diagnostic test. Mentions "prognostic values" but lacks details on intended clinical application (Abstract and Introduction).
4	Yes	"This study aimed to estimate risk factors... and assessed the prognostic values of some detection indicators" (Abstract). Clear objectives and hypotheses.
5	Yes	"this retrospective study" (Abstract). Data collection occurred after index tests and reference standard (28-day survival).
6	Yes	Inclusion/exclusion criteria listed under "Patient Selection" (e.g., age ≥18, sepsis diagnosis, exclusion of chronic dialysis patients).
7	Yes	Participants identified based on "pulmonary infection with microbiological evidence or clinical assessment of sepsis" (Patients and Methods).
8	Yes	"Nanjing First Hospital... from February 2019 to July 2021" (Patients and Methods). Specifies setting and dates.
9	No	No mention of consecutive, random, or convenience sampling. States "151 patients were enrolled" without clarifying selection method.

10a	No	Index tests (e.g., serum cystatin-C) lack technical details for replication (e.g., assay methods, timing of measurements).
10b	No	Reference standard (28-day survival) is defined, but no rationale or method for survival confirmation (e.g., follow-up procedures).
11	No	No justification for using 28-day survival as the reference standard. Prognostic study, not diagnostic accuracy.
12a	No	Cut-offs for index tests (e.g., cystatin-C) derived post hoc from ROC analysis; no pre-specified thresholds.
12b	No	Reference standard (survival) is binary but lacks rationale for positivity definition (e.g., why 28 days?).
13a	No	No information on blinding of index test assessors to clinical data or reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Cox regression," "ROC curve analysis," and "95% confidence intervals" (Statistical Analysis and Results). Appropriate methods for accuracy measures.
15	No	No mention of handling indeterminate/missing test results (e.g., how missing lactate/Cystatin-C data were addressed).
16	No	No description of missing data handling for index tests or reference standard.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses or pre-specified vs. exploratory).
18	No	No justification for sample size (n=151) or power calculation.
19	No	No participant flow diagram; only textual description of enrollment.
20	Yes	Table I reports demographics, comorbidities, and clinical characteristics (e.g., age, BMI, APACHE II).
21a	No	No distribution of disease severity in the target condition (AKI) beyond APACHE II/SOFA scores.
21b	No	No distribution of alternative diagnoses in non-AKI patients. Focused on mortality, not differential diagnoses.
22	No	No discussion of time intervals between index tests (e.g., serum markers) and reference standard (survival).
23	No	No 2x2 contingency table cross-tabulating index test results against survival outcomes.
24	Yes	"AUC... 0.74, 0.67, 0.71, and 0.86" with sensitivity/specificity values (Results). Includes precision estimates.
25	No	No adverse events reported from index tests (blood draws) or reference standard.
26	Yes	Limitations: "retrospective, single-center study" and potential biases (Discussion).
27	Yes	"Implications for practice... effective method for assessing prognoses" (Abstract and Conclusions).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	No	No funding sources or conflicts of interest declared.

Breidthardt 2012

Item No.	Assessment	Support for Assessment
1	Yes	"The prognostic accuracy [...] was quantified by the area under the receiver operating characteristic curve (AUC)" (Abstract). Explicit use of AUC as

		a measure of diagnostic accuracy.
2	Yes	Structured abstract with "Introduction, Methods, Results, Conclusions" sections (Abstract). Complies with STARD for Abstracts guidance.
3	Yes	Introduction describes AKI as a critical complication in AHF and NGAL's role as a biomarker (Introduction).
4	Yes	"We aimed to examine NGAL levels in the prediction of AKI in patients with AHF" (Introduction). Clear objective/hypothesis.
5	Yes	"This prospective study [...] enrolled consecutive AHF patients" (Methods). Data collection was planned prospectively.
6	Yes	Inclusion criteria: "patients >18 years with AHF symptoms/signs"; exclusion: "chronic hemodialysis" (Methods).
7	Yes	Eligibility based on "symptoms and signs of AHF" (Methods).
8	Yes	"Consecutive AHF patients presenting to [...] emergency departments [...] from April 2006 to August 2009" (Methods).
9	Yes	"207 consecutive patients" (Methods). Consecutive series confirmed.
10a	Yes	NGAL measured using Triage® assay with details on sampling intervals and blinding (Methods). Replicable.
10b	Yes	AKI defined by AKIN criteria with creatinine thresholds (Methods). Replicable reference standard.
11	No	No rationale provided for choosing AKIN criteria over other AKI definitions (e.g., RIFLE, KDIGO).
12a	No	NGAL cut-offs not pre-specified; exploratory analysis using ROC curves (Results). No rationale for thresholds.
12b	Yes	AKIN criteria's cut-offs (e.g., ≥0.3 mg/dl creatinine) are pre-specified (Methods).
13a	Yes	"Biomarker measurements [...] performed in a blinded fashion" (Methods). No access to reference standard results.
13b	Yes	AKI diagnosis based on creatinine, which was measured independently of NGAL (blinded assay).
14	Yes	"ROC curve analysis [...] and multivariable regression" for accuracy estimates (Methods).
15	No	No mention of handling indeterminate NGAL or AKIN results (e.g., missing creatinine values).
16	Yes	"Four patients [...] excluded due to missing creatinine data" (Methods). Missing data addressed.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	Yes	Flowchart provided (Figure 1) showing participant inclusion and outcomes.
20	Yes	Table 1 details baseline demographics and clinical characteristics.
21a	No	Severity distribution of AKI (stages 1–3) reported, but no clinical severity of AHF in patients with AKI.
21b	No	No distribution of alternative diagnoses in non-AKI patients (e.g., other causes of renal dysfunction).
22	No	No explicit reporting of time intervals between NGAL measurement and AKI diagnosis.
23	No	No cross-tabulation (2x2 table) of NGAL results vs. AKIN outcomes; only AUC reported.
24	Yes	AUC estimates with 95% CIs for NGAL and creatinine (Results).
25	No	No adverse events from NGAL testing or creatinine measurement mentioned.
26	Yes	Limitations discussed: "mediocre accuracy," retrospective baseline creatinine use (Discussion).
27	Yes	"Plasma NGAL levels do not adequately predict AKI in AHF" (Conclusions). Implications for clinical use stated.
28	No	No trial registration number or registry name provided.

29	No	No mention of a publicly available study protocol.
30	Yes	Funding sources disclosed: "Supported by research grants from [...]" (End of article).

Matsa 2014

Item No.	Assessment	Support for Assessment
1	Yes	"Plasma NGAL performed fairly on admission (AUROC 0.77)... Urine NGAL had a fair predictive value... (AUROC 0.79)" (Results). Explicitly reports AUC values.
2	Yes	Structured abstract includes "Introduction," "Method," "Results," and "Conclusions" sections (Abstract).
3	Yes	"AKI is associated with high morbidity... NGAL has been shown to be secreted early in AKI" (Introduction). Describes clinical role of NGAL.
4	Yes	"We sought to establish the predictive ability... to detect AKI" (Abstract). Clear objectives in Introduction/Methods.
5	Yes	"This prospective observational study" (Methods). Data collection planned before index/reference tests.
6	Yes	"Exclusion criteria: ESRD, renal transplant, AKI by RIFLE criteria" (Methods). Eligibility criteria defined.
7	Yes	"Consecutive adult admissions... absence of chronic kidney disease" (Methods). Basis for eligibility explained.
8	Yes	"Mixed surgical-medical ICU in Reading, UK... May 2011 to April 2012" (Methods). Setting and dates provided.
9	Yes	"Consecutive adult admissions" (Methods). Participants formed a consecutive series.
10a	Yes	"Blood/urine specimens collected... tested for NGAL using Bioporto™ assay" (Methods). Replicable index test details.
10b	Yes	"RIFLE criteria... creatinine and urine output" (Methods). Reference standard clearly defined.
11	Yes	"RIFLE criteria [are] recommended by ADQI consensus" (Introduction). Rationale for reference standard.
12a	Yes	"Manufacturer recommended threshold (400 ng/mL for plasma, 350 ng/mL for urine)" (Results). Cut-offs pre-specified.
12b	No	No explicit definition of positivity cut-offs for RIFLE criteria (only mentions criteria components).
13a	Yes	"Laboratory investigators were blinded to clinical information" (Methods). Clinical info withheld from testers.
13b	No	No mention of whether NGAL results were available to RIFLE assessors.
14	Yes	"ROC analysis... sensitivity, specificity, AUROC" (Methods/Results). Methods for accuracy measures described.
15	No	No description of handling indeterminate test results (e.g., missing NGAL values).
16	No	Mentions decreasing sample size over time but no explicit handling of missing data.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroups or pre-specified vs. exploratory).
18	No	No stated intended sample size or power calculation.
19	Yes	"Flow chart depicting patient enrolment" (Figure 1). Includes a participant flow diagram.
20	Yes	"Table 2 describes patient characteristics" (Results). Demographic/clinical baseline data provided.
21a	No	No distribution of disease severity (e.g., RIFLE stages) in AKI patients.

21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No mention of time intervals or interventions between NGAL and RIFLE assessments.
23	No	No cross-tabulation (2x2 table) of NGAL vs. RIFLE results; only ROC curves reported.
24	Yes	"AUROC 0.77 (95% CI)... sensitivity 0.60 (95% CI)" (Results). Accuracy estimates with precision.
25	No	No mention of adverse events from NGAL or RIFLE testing.
26	Yes	"Limitations include... single-center design, small sample" (Discussion). Study limitations addressed.
27	Yes	"Serial NGAL measurements may be of added value in ICU" (Conclusions). Implications for practice stated.
28	No	No registration number or registry name provided.
29	No	No mention of where the full study protocol can be accessed.
30	Yes	"Sources of funding... approved by National Research Ethics Committee" (Methods/End). Funding and ethics noted.

Pommet 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the ROC curve (AUC-ROC) for NGAL in predicting AKI on day 2 was 0.60 (95% CI 0.51 to 0.70)" (Results). Explicitly reports AUC, a measure of diagnostic accuracy.
2	Yes	The abstract includes structured sections: Objectives, Design, Setting, Participants, Results, Conclusions. Complies with STARD for Abstracts.
3	Yes	"NGAL is a lipocalin-type protein... Clinical studies have shown that serum NGAL level can predict AKI... The aim of this study was to evaluate if serum NGAL levels could predict AKI..." (Introduction). Describes clinical role and intended use.
4	Yes	"The aim of this study was to evaluate the ability of NGAL to predict 48-hour AKI" (Abstract) and hypotheses in Introduction. Clear objectives.
5	Yes	"Prospective, multicentre study" (Abstract). Data collection planned before index test (NGAL) and reference standard (KDIGO criteria).
6	Yes	Inclusion/exclusion criteria detailed under "Participant selection" (Methods). Eligibility criteria explicitly stated.
7	Yes	"Patients were included if they presented to the ED with rhabdomyolysis and a creatine phosphokinase (CPK) level above 1000 IU/L" (Methods). Basis for eligibility (symptoms and prior test results) provided.
8	Yes	"Five adult EDs in France from August 2013 to December 2015" (Setting). Location and dates specified.
9	Yes	"Patients were sampled for convenience" (Methods). Explicitly states convenience sampling.
10a	Yes	"NGAL was measured by immunofluorescence... minimum detection cut-off of 15 ng/mL (Alere Triage NGAL test)" (Methods). Sufficient detail for replication.
10b	Yes	"The primary endpoint was D2 AKI defined by the KDIGO criteria" (Methods). Reference standard (KDIGO) described in detail.
11	Yes	"The definition of AKI has been based... on the KDIGO scale" (Introduction). Rationale for KDIGO as reference standard provided.
12a	Yes	"Optimal cut-off of 129 ng/mL... determined by evaluating sensitivity and specificity for every ROC curve threshold" (Results). Pre-specified cut-off

		rationale.
12b	No	No explicit definition or rationale for KDIGO cut-offs (e.g., creatinine thresholds) beyond citing the scale.
13a	No	No mention of whether clinical information or reference standard results were available to NGAL test performers.
13b	No	No mention of whether index test results were available to KDIGO assessors.
14	Yes	"ROC curve... AUC calculated by the DeLong method... multivariate logistic regression" (Methods). Statistical methods for accuracy measures described.
15	No	No description of handling indeterminate index test or reference standard results (e.g., missing NGAL values).
16	Yes	"189 (96%) were analysed... patients who withdrew consent... were excluded" (Methods). Missing data handled via exclusion.
17	Yes	"After adjustment for CPK levels, age, sex..." (Results). Variability analysis via multivariate regression.
18	Yes	"Required sample size was 171 patients... 197 patients were needed" (Sample size calculation). Justification provided.
19	Yes	"The study flowchart is presented in figure 2" (Results). Participant flow diagram included.
20	Yes	"Baseline demographic and clinical characteristics of participants" (Table 1). Detailed baseline data provided.
21a	No	No distribution of disease severity (e.g., AKI stages) in those with the target condition (AKI).
21b	No	No distribution of alternative diagnoses in patients without AKI.
22	Yes	"Time between onset of rhabdomyolysis and NGAL measurement was 12 (8; 24) hours... standardised therapy initiated" (Methods). Time interval and interventions described.
23	Yes	"Cross tabulation of the index test results... by results of the reference standard" implied in ROC analysis (Table 2). Contingency table data used for sensitivity/specificity.
24	Yes	"AUC-ROC 0.60 (95% CI 0.51 to 0.70)... sensitivity 0.65, specificity 0.50" (Results). Accuracy estimates with precision.
25	No	No mention of adverse events from NGAL testing or reference standard procedures.
26	Yes	"Strengths and limitations" section discusses selection bias, generalisability, and statistical uncertainty.
27	Yes	"Conclusion: NGAL has limited ability to predict AKI... Implications for practice discussed in context of ED use.
28	Yes	"Trail registration number: NCT01544231" (Abstract). Registration number and registry named.
29	Yes	"Full study protocol is available here: [link]" (Methods). Protocol accessibility stated.
30	No	No mention of funding sources or role of funders in the provided text.

Khreba 2019

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analysis... sensitivity was 48% and specificity was 94% with AUC 0.715" (Table 4).
2	Yes	Abstract includes structured sections: Introduction, Methods, Results, Conclusion.
3	Yes	"Urinary kidney injury molecule 1 may play an important role as an early predictor..." (Introduction).

4	Yes	"In our study, we aimed to assess the role of urinary KIM-1..." (Introduction).
5	Yes	"In this prospective cohort study..." (Methods).
6	Yes	"Patients with normal kidneys... eGFR >90 ml/min..." (Methods).
7	Yes	"45 patients who underwent open heart surgery..." (Methods).
8	Yes	"Mansoura University Hospital... from January 2016 to June 2016" (Methods).
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	"Quantitative determination of urinary KIM-1 was done using ELISA..." (Methods).
10b	Yes	"AKI was diagnosed according to KDIGO 2012 guidelines" (Methods).
11	Yes	"KDIGO criteria... increase in SCr..." (Methods).
12a	Yes	"Cut off value of 1.9 ng/mg" (Table 4).
12b	Yes	"Increase in SCr >0.3 mg/dl within 48h..." (Methods).
13a	No	No information on blinding of index test assessors.
13b	No	No information on blinding of reference standard assessors.
14	Yes	"ROC curve statistics were used..." (Methods).
15	No	No mention of handling indeterminate results.
16	No	No mention of missing data handling.
17	No	No analysis of variability in accuracy.
18	No	No sample size justification provided.
19	No	No participant flow diagram.
20	Yes	Baseline demographics in Table 1 (age, sex, comorbidities).
21a	No	AKI severity distribution not specified.
21b	No	Alternative diagnoses in non-AKI group not detailed.
22	Yes	Tests performed "before operation and 3h and 24h after" (Methods).
23	No	No 2x2 table of test vs. reference results.
24	No	AUC reported without confidence intervals (Table 4).
25	No	No mention of adverse events.
26	Yes	"Limitations include... small number of patients..." (Conclusion).
27	Yes	"Urinary KIM-1 can be used as... early diagnosis of AKI" (Conclusion).
28	No	No trial registration number provided.
29	No	No protocol accessibility mentioned.
30	No	No funding sources disclosed.

Makris 2009

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity of 0.91 and specificity of 0.95" and "area under the curve (AUC)" are explicitly reported (Results and Abstract).
2	Yes	Structured abstract includes "Background," "Methods," "Results," and "Conclusions" sections (Abstract).
3	Yes	Background describes AKI's clinical relevance and NGAL's role as an early biomarker (Introduction and Abstract).
4	Yes	Objectives stated: "evaluate urinary NGAL levels as a predictor of early AKI" (Abstract and Methods).
5	No	No explicit mention of prospective/retrospective design; data collection timing unclear.
6	Yes	Inclusion/exclusion criteria listed: adult multi-trauma patients, exclusion for chronic conditions (Methods).
7	No	Basis for identifying eligible participants (e.g., symptoms, prior tests) not explicitly described.
8	No	Setting (ICU of a trauma hospital) mentioned, but dates and detailed location not provided (Methods).
9	No	No description of whether participants were consecutive, random, or convenience-based.
10a	Yes	Index test (urinary NGAL via ELISA) described in sufficient detail (Methods).
10b	Yes	Reference standard (RIFLE criteria for AKI) clearly defined (Methods).
11	No	Rationale for choosing RIFLE over alternatives not explicitly discussed.
12a	No	NGAL cut-off (25 ng/mL) derived from ROC analysis post hoc; no pre-specified rationale (Results).
12b	Yes	RIFLE criteria for AKI classification are pre-specified and defined (Methods).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	ROC analysis and AUC with 95% CI used to estimate accuracy (Results).
15	No	Handling of indeterminate/missing test results not addressed.
16	No	No mention of how missing data were managed.
17	No	No analysis of variability in diagnostic accuracy.
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram included.
20	Yes	Baseline demographics and clinical characteristics provided (Table 1).
21a	No	Severity distribution of AKI (RIFLE stages) not detailed beyond group classifications.
21b	No	Alternative diagnoses in non-AKI patients not discussed.
22	No	Time interval between NGAL testing and RIFLE assessment not explicitly stated.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	AUC, sensitivity, specificity, and 95% CIs reported (Results).
25	No	Adverse events from NGAL or RIFLE testing not mentioned.

26	Yes	Limitations noted: small sample size, single-center design (Discussion).
27	Yes	Implications for practice: NGAL as a reliable predictor of AKI (Conclusions).
28	No	No registration number or registry name provided.
29	No	Full study protocol accessibility not mentioned.
30	No	Funding sources and roles not explicitly declared (only affiliations listed).

Jahaj 2021

Item No.	Assessment	Support for Assessment
1	Yes	"ROC curves were generated to estimate the prognostic value of the biomarkers... NGAL was shown to be more accurate in predicting AKI development than creatinine." (Abstract) Mentions AUC and diagnostic accuracy measures.
2	Yes	Structured abstract includes study design, methods, results, and conclusions.
3	Yes	"The aim of this study was to investigate serum prognostic biomarkers... of AKI in critically ill patients." (Abstract) Background in Introduction discusses AKI and NGAL's clinical role.
4	Yes	"The aim of the present study was to investigate... the effect of NGAL levels on the risk of developing AKI." (Introduction) Explicit objectives and hypotheses.
5	Yes	"This prospective, observational study..." (Methods) Data collection was planned prospectively.
6	Yes	Inclusion/exclusion criteria detailed under "Materials and Methods" (e.g., age >18, ICU stay >5 days, exclusion of sepsis at admission).
7	Yes	"Patients were grouped... based on the development (n=98) or not (n=168) of AKI during their ICU stay." (Abstract) Eligibility based on ICU admission and AKI development.
8	Yes	"Critically ill patients... admitted to a multidisciplinary ICU" (Abstract) and "2017–2020" (Methods).
9	No	No mention of consecutive, random, or convenience sampling in participant selection.
10a	Yes	"NGAL was measured using the immunofluorescent Triage® NGAL Test... detection range 60–1300 ng/mL." (Methods) Sufficient detail for replication.
10b	Yes	"AKI was defined using... RIFLE criteria (serum creatinine, GFR, urine output)." (Methods) Reference standard described.
11	No	No rationale provided for choosing RIFLE over other AKI diagnostic criteria (e.g., KDIGO).
12a	No	NGAL cut-off (90.5 ng/mL) derived post hoc from ROC analysis; no pre-specified thresholds.
12b	Yes	RIFLE criteria for AKI (pre-specified severity categories) used as reference standard.
13a	No	Unclear if clinical information/reference standard results were available to NGAL test performers.
13b	No	Unclear if NGAL results were available to clinicians assessing AKI (reference standard).
14	Yes	"ROC curves... logistic regression... estimates of diagnostic accuracy with 95% CIs." (Methods/Results)
15	No	No mention of handling indeterminate/missing test results (e.g., NGAL assay failures).

16	No	No description of missing data handling for NGAL or creatinine.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	Yes	Figure 1 provides a participant flow diagram.
20	Yes	Table 1 reports demographic/clinical characteristics (age, sex, APACHE/SOFA scores).
21a	No	No distribution of disease severity (e.g., AKI stages) in the AKI group.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Index test (NGAL) and reference standard (AKI diagnosis) measured at ICU admission and during follow-up; time interval implied.
23	No	No cross-tabulation of NGAL results against AKI diagnosis (e.g., 2x2 table).
24	Yes	"AUC 0.67 (95% CI: 0.60–0.74) for NGAL" (Table 2). Precision estimates provided.
25	No	No mention of adverse events from NGAL or creatinine testing.
26	Yes	Limitations include retrospective cut-off determination and single-center design (Discussion).
27	Yes	"NGAL levels... might be predictive of AKI development... Further studies needed." (Abstract/Discussion) Implications for practice discussed.
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	Funding: "This research received no external funding." Conflicts of interest declared.

Guray 2021

Item No.	Assessment	Support for Assessment
1	Yes	"ROC analysis... AUC was 0.91 (95% CI: 0.850–0.984, p=0.001)" (Explicitly reports AUC as a diagnostic accuracy metric).
2	Yes	Structured abstract includes Background, Objective, Materials and methods, Results, Conclusions.
3	Yes	"The clinical role of a test explains its position relative to existing tests... Early detection of CIN may improve prognosis" (Describes intended clinical role of NGAL testing).
4	Yes	"Objective: This study aimed to assess... earlier detection of contrast-induced nephropathy" (Clear objective and hypothesis implied).
5	Yes	"A total of 84 patients... were consecutively enrolled" (Prospective data collection implied by serial measurements).
6	Yes	"Inclusion/exclusion criteria" explicitly defined under "Study population."
7	Yes	"Eligibility criteria: LVSD, referred for coronary angiography" (Basis: clinical condition and procedure).
8	Yes	"Ankara City Hospital... between March 2017 and April 2018" (Setting/location/dates specified).
9	Yes	"Consecutively enrolled" stated in Methods.
10a	Yes	"Plasma NGAL measured using Triage NGAL test... EDTA-anticoagulated whole blood" (Replicable index test details).

10b	Yes	"Serum creatinine... measured 24h before, 48h/72h after" (Reference standard clearly defined).
11	No	No rationale provided for choosing serum creatinine as the reference standard.
12a	Yes	"Cut-off >200 mg/L... pre-specified ROC analysis" (Pre-specified positivity threshold with rationale).
12b	No	No discussion of reference standard (creatinine) cut-offs or rationale.
13a	Unclear	Not explicitly stated whether reference standard results were available to NGAL test performers.
13b	Unclear	Not explicitly stated whether NGAL results were available to creatinine assessors.
14	Yes	"Sensitivity 87%, specificity 91%" and "multivariate logistic regression" (Methods for accuracy measures).
15	No	No mention of handling indeterminate/missing NGAL or creatinine results.
16	No	No description of missing data management.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size calculation or justification provided.
19	No	No participant flow diagram included.
20	Yes	"Baseline characteristics" table includes demographics/comorbidities.
21a	No	No distribution of disease severity in CIN group (e.g., AKI staging).
21b	No	No alternative diagnoses reported in non-CIN group.
22	Yes	"Time interval... blood samplings at 0h/4h/24h/48h/72h" (Timing clearly defined).
23	No	No 2x2 table comparing NGAL results against creatinine-based CIN diagnosis.
24	Yes	"AUC 0.91, 95% CI: 0.850–0.984" (Precision estimates provided).
25	No	No adverse events reported from NGAL or creatinine testing.
26	Yes	"Study limitations... small sample size, single-center design" (Limitations discussed).
27	Yes	"Serial NGAL measurements might help earlier detection" (Clinical implications stated).
28	No	No trial registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	Yes	"Funding: No specific funding reported" (Sources of funding explicitly addressed).

Prowle 2015

Item No.	Assessment	Support for Assessment
1	Yes	"assessed the ability of these biomarkers... to predict RIFLE-R defined AKI" (Abstract); reports AUC values (e.g., "ROCAUC = 0.75"). Explicitly uses diagnostic accuracy measures.
2	Yes	Structured abstract with design ("93 high risk patients"), methods ("measured urinary biomarkers"), results ("AUC = 0.86"), and conclusions

		("combinations... greater clinical utility").
3	Yes	Background in Introduction details AKI diagnosis limitations and biomarkers' roles. States intended use: "earlier diagnosis and risk stratification" (Abstract).
4	Yes	Hypothesis: "combinations of biomarkers would provide better diagnostic accuracy than either alone" (Introduction).
5	Yes	"Samples were obtained from 93 patients enrolled in the CREAT... trial" (Methods). Prospective data collection planned before biomarker/reference standard testing.
6	Yes	Eligibility criteria: "higher risk patients undergoing CPB" (Methods).
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior tests). Mentions "higher risk" but lacks specifics.
8	Yes	"Austin Hospital, Melbourne, Australia" (Methods), "samples... obtained pre-operatively, post-operatively" (Abstract).
9	Yes	Patients from a consecutive cohort: "Of the 100 patients randomized... 93 complete sets were available" (Methods).
10a	Yes	Detailed methods for biomarker assays: "measured by enzyme immunoassay... ELISA... nephelometric technology" (Methods). Replicable.
10b	No	Reference standard (RIFLE creatinine criteria) described but lacks full operationalization (e.g., no urine output criteria).
11	No	No rationale for choosing RIFLE over alternatives (e.g., KDIGO criteria).
12a	No	Cut-offs determined post hoc using Youden index ("maximized sensitivity + specificity"). Not pre-specified.
12b	No	RIFLE cut-offs (50% creatinine rise) pre-specified, but rationale for choosing RIFLE itself not discussed.
13a	Yes	Blinding: "co-investigators performing biomarker assays were blinded to... AKI classification" (Methods). Clinical info unavailable during testing.
13b	Unclear	No explicit statement on whether index test results were available to reference standard assessors (clinical team). Assumed "No."
14	Yes	"ROC analysis... logistic regression... DeLong's test" (Methods). Methods for accuracy estimation described.
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No discussion of missing data handling (e.g., excluded patients due to incomplete samples).
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation described.
19	No	No participant flow diagram provided.
20	Yes	Table 1 summarizes demographics and clinical characteristics (e.g., age, baseline creatinine).
21a	No	No distribution of disease severity in AKI patients (e.g., staging beyond RIFLE classes).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals: biomarkers measured "pre-operatively, post-operatively (4.5 h), and 24 h" (Methods).
23	No	No 2x2 contingency table or distribution of index test vs. reference standard results.
24	Yes	AUCs with 95% CIs reported (e.g., "AUC = 0.86, p = 0.01").
25	No	No adverse events from biomarker or reference standard testing mentioned.
26	Yes	Limitations: "statistical significance... failed to improve risk classification" (Abstract); discusses generalizability.
27	Yes	Implications: "potential to produce models with greater clinical utility" (Abstract).

28	No	No trial registration number or registry name provided (CREAT trial referenced but no NCT ID in main text).
29	No	No statement on protocol accessibility.
30	Yes	Funding: "HHS Public Access... Intrinsic LifeSciences LLC" (Affiliations). Role of funders not explicitly stated.

Valette 2013

Item No.	Assessment	Support for Assessment
1	Yes	"We evaluated the diagnostic and prognostic accuracies of plasma NGAL (pNGAL) for contrast-induced AKI (CI-AKI)..." (Abstract). Explicitly states diagnostic accuracy with AUC metrics (e.g., "area under receiver-operating characteristic curve, 0.85...").
2	Yes	Abstract includes structured sections: Purpose, Methods, Results, Conclusion.
3	Yes	Introduction describes clinical context of CI-AKI in ICU and NGAL's potential role as an early biomarker.
4	Yes	"We wanted to assess the ability of pNGAL to predict development of AKI..." (Introduction).
5	Yes	"prospective observational study" (Methods). Data collection planned before tests.
6	Yes	Inclusion/exclusion criteria detailed (Methods: "exclusion criteria were...").
7	Yes	Eligibility based on stable creatinine, ICU stay >48h, and CM exposure (Methods).
8	Yes	"two adult intensive care units in a university hospital... from July 2010 to May 2011" (Methods).
9	Yes	"100 consecutive critically ill patients" (Methods).
10a	Yes	pNGAL measurement details: sampling times, assay method, blinding (Methods).
10b	Yes	Reference standard defined as AKIN criteria (Methods: "primary outcome was CI-AKI, defined by AKIN criteria").
11	No	No explicit rationale for selecting AKIN over other criteria (e.g., RIFLE).
12a	No	Cut-offs determined post hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	AKIN criteria definitions pre-specified (Methods).
13a	Yes	"measured in a blinded fashion" (Methods). Reference standard results likely blinded.
13b	Unclear	No explicit mention of blinding for reference standard assessors.
14	Yes	ROC curves and AUC used for accuracy estimates (Results).
15	No	No description of handling indeterminate results (e.g., missing NGAL values).
16	Yes	Excluded 2 patients due to missing data (Results: "98 patients analyzed").
17	No	No analysis of variability in accuracy (e.g., subgroup comparisons).
18	Yes	Sample size justified based on prior 20% CI-AKI incidence (Methods).
19	No	No participant flow diagram.
20	Yes	Table 1 reports demographics, comorbidities, and clinical scores.

21a	No	No distribution of disease severity in CI-AKI patients.
21b	No	No distribution of alternative diagnoses in non-CI-AKI patients.
22	No	Time interval between index test and reference standard not explicitly addressed.
23	No	No cross-tabulation of index test vs. reference standard results.
24	Yes	AUC values with 95% CIs reported for RRT prediction (Results).
25	No	No mention of adverse events from NGAL testing or CM.
26	Yes	Limitations discussed: pNGAL's poor CI-AKI prediction, confounding factors (e.g., sepsis) (Discussion).
27	Yes	Conclusions highlight pNGAL's potential role in predicting RRT need (Abstract).
28	No	No registration number or registry name provided.
29	No	No statement on protocol availability.
30	No	Funding sources or conflicts of interest not declared.

Teo 2023

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity and specificity of NGAL levels >490 ng/dL for AKI were 59% (95% confidence interval [CI] 49%–68%) and 65% (95% CI 61%–68%), respectively." (Explicitly reports sensitivity and specificity as accuracy measures.)
2	Yes	Structured abstract includes "Introduction," "Methods," "Results," and "Conclusion" sections with key design and outcome summaries.
3	Yes	"Creatinine has limitations... Our study examined the utility of neutrophil gelatinase-associated lipocalin (NGAL) in predicting AKI..." (Describes clinical role of NGAL as an alternative biomarker.)
4	Yes	"Our study examines the usefulness of serum NGAL as a biomarker of AKI... and as a predictor of... mortality." (States objectives and hypotheses.)
5	Yes	"This is a single-centre prospective cohort study..." (Data collection planned prospectively.)
6	Yes	"Inclusion and exclusion criteria... aged ≥21 years, eGFR <60 mL/min/1.73 m^2, CCF, SIRS, or required admission." (Lists eligibility criteria.)
7	Yes	"Patients were identified based on CCF, SIRS, or admission needs." (Criteria for identifying participants.)
8	Yes	"Conducted at Singapore General Hospital ED from July 2011 to August 2012." (Specifies setting and dates.)
9	No	No explicit mention of consecutive, random, or convenience sampling in recruitment.
10a	Yes	"Serum NGAL was measured using the Triage® NGAL Test... with Alere Triage® MeterPro." (Detailed index test methodology.)
10b	Yes	"AKI was defined by AKIN criteria: ≥0.3 mg/dL creatinine increase or 1.5× baseline within 48 hours." (Reference standard clearly defined.)
11	No	No rationale provided for choosing AKIN over other criteria (e.g., RIFLE or KDIGO).
12a	No	NGAL cut-off determined post hoc using Youden index ("optimal cut-offs were derived"), not pre-specified.
12b	Yes	AKIN criteria thresholds (≥0.3 mg/dL or 1.5× baseline) were pre-defined.

13a	Yes	"AKI was diagnosed by researchers blinded to experimental measurements." (Blinded index test interpretation.)
13b	No	No information on whether NGAL results were available to reference standard assessors.
14	Yes	"ROC curves, AUC, sensitivity, specificity, and logistic regression" used for accuracy estimation.
15	Yes	"For NGAL >1,300 ng/dL, values were treated as 1,300... no significant difference in outcomes." (Handling of indeterminate results.)
16	No	No mention of missing data handling for NGAL or reference standard.
17	No	No analysis of variability in accuracy measures (e.g., subgroup analyses not pre-specified).
18	Yes	"Sample size estimated... based on sensitivity (70%–85%) and prevalence (10%–15%)."
19	Yes	"Study flow is illustrated in Figure 1." (Participant flow diagram provided.)
20	Yes	"Patient demographics... baseline physiologic and laboratory values" in Table 1.
21a	No	No distribution of AKI severity (e.g., AKIN stages) in the target population.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No mention of time interval between NGAL testing and AKI diagnosis.
23	No	No 2x2 contingency table comparing NGAL results with AKIN criteria.
24	Yes	"Sensitivity 59% (95% CI 49%–68%), specificity 65% (95% CI 61%–68%)." (Precision estimates included.)
25	No	No adverse events reported from NGAL testing or reference standard.
26	Yes	"Study limitations... NGAL's moderate accuracy and single-center design." (Limitations discussed.)
27	Yes	"Serum NGAL identifies AKI and predicts three-month mortality." (Clinical implications stated.)
28	No	No registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	"Sources of funding... SingHealth Research." (Funding disclosed.)

Jin 2023

Item No.	Assessment	Support for Assessment
1	Yes	"a receiver operating characteristic (ROC) curve was utilized to determine the prognostic values of IL-17A... sensitivity and specificity were 77.4% and 71.0%, respectively." The study explicitly reports sensitivity and specificity, key measures of diagnostic accuracy.
2	No	The abstract lacks a structured format (e.g., separate headings for design, methods, results, conclusions) as recommended by STARD for Abstracts.
3	Yes	"The aim of this study was to evaluate the roles of interleukin (IL)-17A in risk stratification and prognosis... early detection and treatment access is beneficial to the prognosis of SAKI patients." Describes the clinical role of IL-17A as a prognostic biomarker.
4	Yes	"The aim of this study was to evaluate... IL-17A in risk stratification and prognosis..." Clearly states study objectives and hypotheses.
5	Yes	"All clinical parameters were evaluated upon admission before administering antibiotic treatment." Indicates prospective data collection before

		interventions.
6	Yes	"Exclusion criteria... under 18 or over 80 years, chronic kidney disease... cancer, etc." Explicitly lists eligibility criteria.
7	Yes	"Patients were enrolled based on Sepsis-3 definition and SAKI diagnosis via KDIGO criteria." Identifies participants via clinical symptoms and diagnostic criteria.
8	Yes	"146 sepsis patients admitted to the emergency department from November 2020 to November 2021." Specifies setting, location, and dates.
9	No	No mention of whether participants were consecutive, random, or a convenience series.
10a	Yes	"IL-17A levels were assessed by FACSCalibur flow cytometer... Pylon 3D Automated Immunoassay System." Sufficient detail to replicate the index test.
10b	Yes	"SAKI diagnosis based on KDIGO criteria (serum creatinine or urine output)." Describes reference standard clearly.
11	No	No rationale provided for choosing KDIGO as the reference standard over alternatives.
12a	No	The IL-17A cutoff (4.7 pg/mL) was derived from ROC analysis post hoc, not pre-specified.
12b	Yes	KDIGO staging (reference standard) uses pre-specified creatinine/urine output cutoffs.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curve... sensitivity, specificity, AUC (0.811)." Methods for accuracy estimation are described.
15	Yes	"Excluded patients with missing inflammatory cytokine data." Mentions handling of missing data.
16	Yes	Same as Item 15; exclusion for missing data implies handling method.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No justification for sample size (e.g., power calculation).
19	No	No participant flow diagram provided.
20	Yes	Table 1 includes demographic/clinical characteristics (age, sex, biomarkers, etc.).
21a	Yes	"IL-17A levels differed significantly among SAKI stages 1, 2, and 3." Reports disease severity distribution.
21b	No	No distribution of alternative diagnoses in non-SAKI patients.
22	No	No time interval reported between IL-17A testing and SAKI diagnosis.
23	No	No 2x2 table cross-tabulating index test results against reference standard.
24	No	Sensitivity/specificity reported without confidence intervals.
25	No	No mention of adverse events from IL-17A testing or SAKI diagnosis.
26	Yes	"The usefulness of IL-17A in treating SAKI requires further research." Acknowledges limitations.
27	Yes	"Elevated IL-17A could predict worsening kidney injury... implications for SAKI prognosis." Discusses clinical relevance.
28	No	No registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	Yes	"Sources of funding... Medical Ethics Committee of Tianjin Medical University." Funding details included.

Finge 2017

Item No.	Assessment	Support for Assessment
1	Yes	"The ability of urinary [TIMP-2] × [IGFBP-7] to predict AKI [...] was assessed by building a receiver operating characteristic curve (with 95% confidence interval)." (Explicit use of AUC and sensitivity/specificity).
2	Yes	Structured abstract includes BACKGROUND, METHODS, RESULTS, CONCLUSIONS sections.
3	Yes	Background describes clinical role of urinary biomarkers for AKI prediction and compares to serum creatinine.
4	Yes	"This study aimed at testing the hypothesis that [...] urinary [TIMP-2] × [IGFBP-7] [...] could predict postoperative AKI."
5	Yes	"Prospective study conducted from April 1, 2014, to September 18, 2014."
6	Yes	Inclusion/exclusion criteria specified: "Patients undergoing cardiac surgery [...]", exclusion of chronic renal insufficiency patients, etc.
7	Yes	Patients identified based on undergoing cardiopulmonary bypass surgery.
8	Yes	"Conducted [...] in the cardiothoracic surgery center of Clinique des Franciscaines in Nîmes (France)" with dates.
9	No	No description of consecutive, random, or convenience sampling method.
10a	Yes	Detailed description of index test: "Urinary [TIMP-2] × [IGFBP-7] measured 3h postoperatively using NephroCheck test."
10b	Yes	Reference standard defined as KDIGO criteria: "KDIGO stage >0 within 48h postoperatively."
11	Yes	Rationale: "KDIGO stage >0 was chosen [...] as in recent studies focusing on cardiac surgery patients."
12a	Yes	Cut-offs defined (0.09-1.40 ng/mL²/1000) with rationale for gray zone approach.
12b	Yes	KDIGO staging criteria clearly defined in methods.
13a	Unclear	No explicit statement about blinding of index test assessors to reference standard results.
13b	Unclear	No explicit statement about blinding of reference standard assessors to index test results.
14	Yes	"ROC curve [...] with 95% CI [...] gray zone approach [...] sensitivity >0.90 and specificity >0.90."
15	No	No mention of handling indeterminate test results.
16	No	No description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy.
18	Yes	Sample size calculation described: "Area under ROC ≥0.7" used for clinical relevance.
19	No	No participant flow diagram provided.
20	Yes	Table shows demographic data (age, weight, BMI, comorbidities).
21a	Yes	AKI severity distribution shown: 34/93 patients with KDIGO >0.
21b	Yes	Non-AKI group described with alternative diagnoses in Table 1.
22	Yes	Time interval specified: "3-hour postoperative period" vs KDIGO within 48h.
23	Yes	Cross-tabulation implied in ROC analysis and gray zone results.

24	Yes	"AUC 0.73 (95% CI 0.62-0.83)" with sensitivity/specificity estimates.
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed: small sample size, single-center design.
27	Yes	Conclusion states biomarker "could not accurately predict AKI" with clinical implications.
28	No	No registration number or registry name provided.
29	No	No protocol accessibility statement.
30	Yes	"Supported by academic grants from the University Hospital of Nîmes [...] no conflicts of interest."

Wybraniec 2017

Item No.	Assessment	Support for Assessment
1	Yes	"Receiver operating characteristic curve analysis denoted that post-procedural IL-18 levels at 6 h >89.8 pg/mg (AUC = 0.75, P = 0.007), KIM-1 at 6 h >0.425 ng/mg (AUC = 0.81, P = 0.001), renal resistive index (RRI) at 1 h >0.73 (AUC 0.88; P < 0.0001), and renal pulsatility index (RPI) at 1 h >0.86 (AUC = 0.86; P < 0.0001) predicted CI-AKI onset." (Explicit use of AUC as a measure of diagnostic accuracy.)
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions. Example: "Conclusions: Joint assessment of early post-procedural urinary biomarkers and Doppler renovascular parameters aids early diagnosis of CI-AKI..."
3	Yes	"The study aimed to evaluate the diagnostic utility of urinary IL-18, KIM-1, and L-FABP [...] for the prediction of CI-AKI." (Background and intended use of index tests described in Introduction and Objectives.)
4	Yes	"The study was designed to evaluate the applicability of combined assessment [...] for the prediction of CI-AKI." (Clear objectives and hypothesis in Background.)
5	Yes	"This prospective observational study covered 95 consecutive patients..." (Data collection planned prospectively.)
6	Yes	Inclusion/exclusion criteria listed under "Patients and Methods": e.g., exclusion of eGFR <50 mL/min, proteinuria, etc.
7	Yes	"Consecutive patients with either: (i) stable angina [...] or (ii) non-ST-elevation acute coronary syndrome..." (Basis for identifying participants: clinical symptoms/diagnosis.)
8	Yes	"Enrolled [...] between 2013 and 2015" and "Public Hospital No. 7 in Katowice" (Setting, location, and dates specified.)
9	Yes	"95 consecutive patients" (Consecutive series explicitly stated.)
10a	Yes	Detailed methods for urinary biomarkers (ELISA assays, normalization to creatinine) and Doppler indices (equipment, calculations for RRI/RPI).
10b	Yes	Reference standard defined: "CI-AKI was defined as ≥50% relative or ≥0.3 mg/dL absolute increase of serum creatinine concentration at 48 h post-procedurally."
11	No	No rationale provided for choosing serum creatinine as the reference standard over alternatives.
12a	No	Cut-offs for index tests (e.g., IL-18 >89.8 pg/mg) were derived from ROC analysis (exploratory, not pre-specified).

12b	Yes	CI-AKI definition (≥50% or ≥0.3 mg/dL SCr increase) was pre-specified in Methods.
13a	No	No mention of blinding between index test assessors and reference standard results.
13b	No	No mention of blinding between reference standard assessors and index test results.
14	Yes	"ROC curve analysis" and "logistic regression" used to compare diagnostic accuracy measures.
15	No	No description of handling indeterminate results (e.g., missing biomarker/Doppler data).
16	No	No mention of handling missing data for index tests or reference standard.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No explanation of intended sample size or power calculation.
19	No	No participant flow diagram; only textual description of enrollment.
20	Yes	"Baseline demographic and clinical characteristics of participants" summarized in Table 1 and text.
21a	No	No distribution of disease severity in CI-AKI patients (e.g., staging beyond AKI Network criteria).
21b	No	No distribution of alternative diagnoses in non-CI-AKI patients.
22	Yes	Time intervals specified: "urine samples collected [...] 6 h after CA/PCI" and SCr measured "48 h post-procedurally."
23	No	No 2x2 table or cross-tabulation of index test vs. reference standard results.
24	No	AUC values reported, but no confidence intervals (e.g., "AUC = 0.88; P < 0.0001" lacks 95% CI).
25	No	No adverse events reported from index tests or reference standard.
26	Yes	Limitations discussed: "small sample size" and "single-center design."
27	Yes	"Implications for practice [...] aids early diagnosis of CI-AKI" (Clinical role of tests emphasized.)
28	No	No registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	Yes	"The study was financed by [...] Adamed Group under the auspices of Polish Society of Cardiology."

Yang 2016

Item No.	Assessment	Support for Assessment
1	Yes	"Combination of Urinary Biomarkers Improves Early Detection of Acute Kidney Injury... AUC of 0.828, sensitivity of 71.0%, specificity of 43.0%" (Title, Abstract). Explicitly reports diagnostic accuracy metrics.
2	Yes	Structured abstract includes "Background," "Methods and Results," and "Conclusions" sections (Abstract).
3	Yes	Introduction describes AKI's clinical impact in heart failure and the need for early biomarkers, stating the intended use of Cys-C, NGAL, and KIM-1 (Background section).
4	Yes	"The present study investigated this hypothesis, compared the efficacy... combined usage" (Introduction). Clear objectives and hypotheses.

5	Yes	"This was a prospective observational study" (Methods). Data collection planned before index/reference tests.
6	Yes	Inclusion/exclusion criteria specified: "age ≥18 years, admission for ADHF... excluded if dialysis, prior transplantation, refusal" (Methods).
7	Yes	Participants identified based on "symptoms (ADHF), previous tests (diuretic use)" (Methods: "inclusion criteria").
8	Yes	"Conducted in the coronary care unit (CCU) of a tertiary care university hospital... December 2013 to February 2015" (Methods).
9	No	No explicit statement on whether participants were consecutive, random, or convenience series.
10a	Yes	Index tests (Cys-C, NGAL, KIM-1) described in detail: ELISA kits, storage conditions, duplicate measurements (Methods: "Sampling and Quantifying Biomarkers").
10b	Yes	Reference standard (KDIGO AKI criteria) defined: "≥0.3 mg/dl SCr within 48h or ≥1.5× baseline within 7 days" (Methods).
11	Yes	KDIGO guidelines cited as the reference standard rationale (Methods: "according to KDIGO...").
12a	No	Cut-offs determined post hoc using Youden index ("calculated cut-off values... optimal Youden index"); no pre-specified thresholds.
12b	Yes	KDIGO criteria for AKI (reference standard) use pre-defined SCr thresholds (Methods).
13a	No	No information on whether reference standard results were available to index test assessors.
13b	No	No information on whether index test results were available to reference standard assessors.
14	Yes	"Receiver operating characteristic (ROC) curve... AUC analysis" (Statistical Analysis).
15	No	No mention of handling indeterminate index/reference test results.
16	No	No description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size calculation or justification provided.
19	Yes	Participant flow diagram provided (Figure 1B).
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	No distribution of disease severity in AKI patients (e.g., AKI stages).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (biomarker measurement) and reference standard (AKI diagnosis) not specified.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"AUC of 0.828, sensitivity 71.0%, specificity 43.0%" (Abstract, Results).
25	No	No adverse events reported from biomarker testing or AKI diagnosis.
26	Yes	Limitations discussed: single-center design, small sample size (Conclusions).
27	Yes	"Combination biomarkers... effective clinical model for predicting AKI" (Conclusions). Clinical implications stated.
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	"The study protocol was approved by the local institutional review board... Chang Gung Cardio-Renal Research Group" (Methods, affiliations). Funding sources implied.

Pilarczyk 2022

Item No.	Assessment	Support for Assessment
1	Yes	"Preoperative Cystatin C (AUC 0.828, p < 0.001)...[TIMP-2]*[IGFBP7] 4 h after surgery (AUC 0.724, p = 0.020)" (Explicit use of AUC for diagnostic accuracy).
2	Yes	Structured abstract includes Background, Methods, Results, and Conclusions.
3	Yes	"Risk assessment for AKI...due to lack of sensitive biomarkers...Cystatin C and [TIMP-2]*[IGFBP7] were evaluated" (Background and clinical role described).
4	Yes	"Aim...to analyze the predictive accuracy of Cystatin C and [TIMP-2]*[IGFBP7]" (Objectives stated).
5	Yes	"101 consecutive patients were prospectively enrolled" (Prospective data collection).
6	Yes	Inclusion/exclusion criteria: age ≥18, elective TAS; exclusion of acute dissection, preoperative RRT.
7	No	No explicit description of how potentially eligible participants were identified (e.g., symptoms, prior tests).
8	Yes	"Department of Cardiovascular Surgery...between December 2016 and March 2018" (Setting and dates provided).
9	Yes	"101 consecutive patients" (Consecutive series).
10a	Yes	"[TIMP-2]*[IGFBP7] measured with NephroCheck™Test; Cystatin C via immuno-turbidimetric assay" (Replicable methods).
10b	Yes	"KDIGO classification...defined using serum creatinine and urine output" (Reference standard detailed).
11	Yes	"KDIGO...accepted as gold standard due to lack of reliable biomarkers" (Rationale for reference standard).
12a	No	No pre-specified positivity cut-offs for biomarkers; exploratory ROC analysis used.
12b	Yes	KDIGO criteria pre-specified (thresholds for AKI stages defined).
13a	Yes	"Physicians blinded to biomarker results" (No contamination from reference standard).
13b	Yes	"Laboratory investigators blinded to clinical outcomes" (No contamination from index test).
14	Yes	"ROC curve generated...AUC values reported" (Methods for accuracy estimation).
15	No	No mention of handling indeterminate/missing biomarker results.
16	No	No description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup comparisons).
18	Yes	Sample size calculation based on power analysis (n=60 required; 101 enrolled).
19	Yes	CONSORT flow diagram provided (Figure 1).
20	Yes	Baseline demographics in Table 2 (age, sex, EuroScore, etc.).
21a	No	No distribution of AKI severity beyond KDIGO staging.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	No	No discussion of time intervals between index test and reference standard.

23	No	No cross-tabulation of index test vs. reference standard results (e.g., 2x2 table).
24	Partially	AUC values reported but no confidence intervals (e.g., "AUC 0.828" without 95% CI).
25	No	No adverse events mentioned from biomarker testing.
26	Yes	Limitations: small sample size, single-center design (Discussion section).
27	Yes	"Cystatin C represents a sensitive biomarker...superior to creatinine" (Implications for practice).
28	No	No registration number or registry name provided.
29	No	No protocol accessibility statement.
30	Yes	"The study was approved by the Institutional Ethical Review Board...no funding declared" (Ethics approval and funding statement).

De geus 2013

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve for AKI was unaffected by the presence of sepsis (0.76 in sepsis vs 0.78 in nonsepsis; p = 0.72)" (AUC explicitly reported as a measure of diagnostic accuracy).
2	Yes	Structured abstract includes "Aim," "Materials & methods," "Results," and "Conclusion" sections under the heading.
3	Yes	"Biomarker-guided risk stratification for occurrence of AKI might allow timely provision of supportive and interventional care... Plasma NGAL also differentiates between bacterial and viral infections..." (clinical role and intended use of NGAL described).
4	Yes	"The hypothesis is that sepsis alters optimal cutoff values but not the diagnostic value of NGAL for AKI, as compared with nonsepsis." (explicit objectives and hypotheses stated).
5	Yes	"This is a prospective single-center cohort study" (prospective data collection planned before index/reference tests).
6	Yes	Inclusion/exclusion criteria: "age under 18, refusal of informed consent, a history of nephrectomy, documented chronic kidney disease...".
7	Yes	"All consecutively admitted critically ill adult patients" (basis for identifying participants: ICU admission).
8	Yes	"Prospective single-center cohort study... Erasmus MC University Medical Center... between 1 September 2007 and 1 April 2008." (setting, location, dates specified).
9	Yes	"All consecutively admitted critically ill adult patients" (consecutive series).
10a	Yes	"Plasma NGAL concentrations were measured... using the Triage® immunoassay... at ICU admission (t=0 h) and at four time points thereafter (t=4, 8 and 24 h)" (index test details sufficient for replication).
10b	Yes	"AKI was defined using the Acute Kidney Injury Network (AKIN) classification... SCr increase >50% or an absolute SCr rise of 0.3 mg/dl" (reference standard clearly defined).
11	No	No rationale provided for choosing AKIN criteria over alternative definitions (e.g., RIFLE or KDIGO).
12a	Yes	"Optimal test cutoff values were higher in the former... Youden index was calculated" (pre-specified rationale for cutoffs).

12b	No	No explicit definition or rationale for AKIN classification thresholds (assumed as standard without justification).
13a	Unclear	Not explicitly stated whether clinical information/reference standard results were available to NGAL test performers.
13b	Unclear	Not explicitly stated whether NGAL results were available to AKI assessors.
14	Yes	"ROC curves... AUC was expressed with 95% confidence interval... sensitivity and specificity" (methods for accuracy measures described).
15	No	No mention of handling indeterminate NGAL or AKI results (e.g., missing biomarker values).
16	No	No description of missing data handling for NGAL or SCr measurements.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup comparisons beyond sepsis/nonsepsis).
18	No	No sample size calculation or justification provided.
19	Yes	Figure 1: Flow diagram of participant inclusion/exclusion.
20	Yes	Table 1: Baseline demographic/clinical characteristics stratified by sepsis and AKI.
21a	Yes	AKIN stages 1–3 reported in Table 1 (severity distribution in target condition).
21b	No	No distribution of alternative diagnoses in non-AKI patients (e.g., sepsis sources in Table 1 but not linked to non-AKI).
22	Yes	"Time interval... at ICU admission (t=0 h) and at four time points thereafter" (index/reference tests performed concurrently).
23	No	No cross-tabulation of NGAL results vs. AKIN classification (only ROC/AUC reported).
24	Yes	"AUC = 0.78 [0.67–0.86] for sepsis... 0.76 [0.72–0.79] for nonsepsis" (accuracy estimates with 95% CIs).
25	No	No mention of adverse events from NGAL testing or SCr measurements.
26	Yes	"Study limitations... generalizability limited to ICU settings" (limitations discussed in conclusion).
27	Yes	"Implications for practice... cutoff values should be adjusted in sepsis" (clinical role of NGAL emphasized).
28	No	No registration number or registry name provided.
29	No	No reference to a publicly accessible study protocol.
30	Yes	"Sources of funding... Biosite Inc... role of funders not mentioned" (funding disclosed but role unclear).

Cummings 2019

Item No.	Assessment	Support for Assessment
1	Yes	"The maximum [TIMP-2]$[IGFBP7] between these 2 timepoints provided an area under the receiver operating characteristic curve of 0.82 (95% confidence interval [CI], 0.73-0.90), 100% sensitivity, and 100% negative predictive value..." (Explicitly reports AUC, sensitivity, and NPV as accuracy measures).
2	Yes	Structured abstract with Objective, Methods, Results, Conclusions sections.
3	Yes	"Acute kidney injury (AKI) is one of the most serious and common complications of cardiac surgery... Urinary [TIMP-2]$[IGFBP7] is discussed as an early biomarker for renal stress and AKI." (Background and clinical role described).

4	Yes	"We conducted this study to test the hypothesis that intraoperative concentrations of urinary [TIMP-2]$[IGFBP7] are associated with postoperative AKI." (Explicit objective and hypothesis).
5	Yes	"This prospective cohort study used urine specimens collected during a previously published trial..." (Data collection planned prospectively).
6	Yes	"All adult patients undergoing elective coronary bypass grafting, valvular heart surgery, or ascending aortic surgery... Exclusion criteria included prior statin intolerance, liver dysfunction, etc." (Eligibility criteria listed).
7	Yes	"All adult patients undergoing elective... surgery at Vanderbilt University Medical Center were eligible." (Identified based on surgical procedure).
8	Yes	"Patients... at Vanderbilt University Medical Center (VUMC)... enrolled between November 2009 and December 2014." (Setting, location, and dates specified).
9	Yes	"Four hundred sequential Statin AKI Cardiac Surgery Randomized Clinical Trial patients comprised the cohort." ("Sequential" implies consecutive series).
10a	Yes	"[TIMP-2]$[IGFBP7] was measured using the commercially available NephroCheck test... Urine specimens were obtained at 8 perioperative timepoints." (Detailed index test methodology).
10b	Yes	"The primary endpoint was stage 2 or 3 AKI... defined by KDIGO criteria (serum creatinine changes)." (Reference standard clearly defined).
11	Yes	"Current diagnostic criteria for AKI rely on changes in serum creatinine... which reflect kidney function as a surrogate for injury." (Rationale for KDIGO as reference standard).
12a	Yes	"Using the >0.3 cutoff to predict stage 2 or 3 AKI." (Pre-specified cutoff with rationale in Introduction).
12b	No	No explicit definition or rationale for KDIGO cutoffs in the study (assumed standard criteria without justification).
13a	Yes	"Laboratory personnel blinded to all subject characteristics." (Clinical/reference standard information unavailable to index test performers).
13b	No	Unclear if assessors of KDIGO criteria (serum creatinine) were blinded to biomarker results (not explicitly stated).
14	Yes	"Multivariable logistic regression... AUROC... 95% CIs estimated by bootstrap." (Methods for accuracy measures described).
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	No description of missing data handling.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size calculation or justification provided.
19	Yes	Figure 1: Flow diagram of participants included.
20	Yes	Table 1: Baseline demographic/clinical characteristics reported.
21a	No	Distribution of AKI severity (stage 2 vs. 3) not detailed beyond counts.
21b	No	No description of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (intraoperative) and reference standard (postoperative 48h) not explicitly addressed for potential confounding.
23	No	No 2x2 contingency table or cross-tabulation of index test vs. reference standard results.
24	Yes	"AUROC of 0.82 (95% CI, 0.73-0.90)... 100% sensitivity... 100% negative predictive value." (Accuracy estimates with precision).
25	No	No adverse events related to biomarker testing reported.

26	Yes	"Study limitations... small sample size... single-center design." (Limitations discussed).
27	Yes	"Intraoperative elevations... could provide an opportunity to alter postoperative management to prevent kidney injury." (Clinical implications stated).
28	No	No registration number or registry name provided (trial referenced but not registered per text).
29	No	No mention of where the full protocol can be accessed.
30	Yes	"Supported by grants... National Institutes of Health... Vanderbilt University..." (Funding sources disclosed).

Patel 2023

Item No.	Assessment	Support for Assessment
1	Yes	"At a cutoff value of ≥114.9 (ng/mL), urinary NGAL represents a sensitivity of 86.92% and specificity of 100%... AUC 0.966 (95% CI: 0.919–0.990)" (Results). Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusion.
3	Yes	Introduction discusses AKI in cirrhosis and clinical role of uNGAL: "ideal biomarker... specific, easy to test" (Introduction).
4	Yes	"The study aimed to examine... uNGAL as a diagnostic and prognostic marker of AKI" (Abstract).
5	Yes	"A prospective study was carried out" (Methods).
6	Yes	Inclusion/exclusion criteria detailed under "Methods": age, cirrhosis, exclusion of renal diseases, etc.
7	Yes	"490 patients... screened... fulfilling inclusion criteria" (Methods). Basis: hospitalization for cirrhosis.
8	Yes	"Medicine intensive care unit (MICU)... King George's Medical University, Lucknow... August 2020–July 2021" (Methods).
9	No	No mention of consecutive, random, or convenience sampling. Stated "screened 490 patients... 90 analyzed" but recruitment method unclear.
10a	Yes	uNGAL measured via ELISA kit, urine sampling protocol, and storage details (Methods).
10b	Yes	Reference standard: AKIN criteria for AKI and HRS definitions (Methods).
11	No	No rationale provided for choosing AKIN criteria over alternatives.
12a	Yes	Cutoff ≥114.9 ng/mL defined with sensitivity/specificity (Results). Pre-specified via ROC analysis.
12b	No	No rationale for AKIN criteria cutoffs; definitions (e.g., serum creatinine thresholds) not justified.
13a	No	Unclear if reference standard results were available to uNGAL testers. Not explicitly stated.
13b	No	Unclear if uNGAL results influenced reference standard assessors. Not addressed.
14	Yes	"ROC curve... sensitivity, specificity, AUC... MedCalc® software" (Statistical Analysis).
15	No	No mention of handling indeterminate uNGAL or reference standard results.
16	No	Missing data handling (e.g., excluded patients) not described.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	Sample size calculation formula provided (n = 89) (Methods).

19	Yes	Flow diagram included (Fig. 1).
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	Yes	AKI severity distribution: 66.7% developed AKI (Results).
21b	Yes	Non-AKI groups (prerenal, HRS, ATN) described (Tables 1–3).
22	No	Time interval between uNGAL testing and reference standard not specified.
23	No	No 2x2 table cross-tabulating uNGAL results against AKI status.
24	Yes	"AUC 0.966 (95% CI: 0.919–0.990)" (Results).
25	No	Adverse events from uNGAL or AKI testing not reported.
26	Yes	Limitations discussed: small sample, single-center design (Conclusion).
27	Yes	"uNGAL is good for diagnosing AKI... prognostic marker" (Conclusion).
28	No	No registration number or registry name provided.
29	No	Protocol accessibility not mentioned.
30	Yes	"Source of support: Nil" (Conflict of Interest section).

Szymanowicz 2021

Item No.	Assessment	Support for Assessment
1	Yes	"AUC ROC", "sensitivity, specificity, predictive values" are reported in the Abstract and Results.
2	Yes	Abstract includes structured sections: Background, Aims, Methods, Results, Conclusions.
3	Yes	Introduction describes CS-AKI clinical relevance and the role of NIRS/biomarkers as index tests.
4	Yes	Aims section states objectives: "ascertain whether... could help with CS-AKI prediction."
5	Yes	"prospective observational study" (Methods 2.1).
6	Yes	Inclusion/exclusion criteria listed in Methods 2.1 (age ≥18, LVEF <30%, eGFR <30 excluded).
7	Yes	Participants identified based on undergoing "cardiac surgery using CPB" (Methods 2.1).
8	Yes	"single-centre" study with dates "December 2016–November 2018" (Methods 2.1).
9	Yes	"all adult patients... were prospectively included" implies consecutive enrollment (Methods 2.1).
10a	Yes	NIRS device (INVOS monitor) and biomarker methods described in detail (Methods 2.2, 2.3).
10b	Yes	Reference standard: KDIGO criteria for creatinine changes (Methods 2.1).
11	Yes	KDIGO is the established clinical standard for AKI diagnosis (Methods 2.1).
12a	No	Cut-offs (e.g., NGAL ≥91.5 ng/mL) derived post-hoc from ROC analysis; no pre-specified thresholds (Results).
12b	Yes	KDIGO criteria are pre-specified (Methods 2.1).
13a	No	No information on whether reference standard results were available to index test assessors.

13b	No	No information on whether index test results were available to reference standard assessors.
14	Yes	"AUC ROC", sensitivity, specificity, logistic regression used (Methods 2.4).
15	No	No mention of indeterminate results or handling methods.
16	No	Excluded 11 patients due to lack of consent; no other missing data handling described.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	No sample size justification or power calculation provided.
19	No	Text describes participant flow but no diagram.
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	No	AKI stages are mentioned but no distribution of severity (e.g., stage 1–3 proportions).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time points for index tests (during/after surgery) and reference standard (up to 48h) are specified.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	No	AUCs reported but no confidence intervals for accuracy estimates (Results).
25	No	No mention of adverse events from NIRS or biomarker tests.
26	Yes	Limitations discussed: single-center, small sample, lack of long-term outcomes (Discussion).
27	Yes	Conclusion states implications for CS-AKI prediction using combined parameters.
28	Yes	Registration number NCT02979275 provided (Methods 2.1).
29	No	No statement on where the full study protocol can be accessed.
30	No	Funding noted as "open access" under CC BY license, but no explicit funding sources or roles described.

Shakked 2022

Item No.	Assessment	Support for Assessment
1	Yes	"AUC, 0.86 and 0.87, respectively... AUC, 0.94 and 0.95, respectively" (Abstract). Explicitly reports diagnostic accuracy using AUC.
2	Yes	Structured abstract with Background, Methods, Results, Conclusions.
3	Yes	"Scientific and clinical background" provided in Introduction, including the role of sCysC and sNGAL in AKI diagnosis.
4	Yes	Objectives stated: "assess the utility of sCysC and sNGAL for predicting COVID-19-associated AKI..." (Abstract).
5	Yes	"prospective, observational investigation" (Methods). Data collection planned before index/reference tests.
6	Yes	Eligibility criteria: adults with COVID-19 symptoms, positive NAAT; exclusions listed (Methods).
7	Yes	Basis: "symptoms, results from previous tests" (Methods: "undergoing clinically routine blood draw").
8	Yes	"ED of University of Cincinnati Medical Center... April-May 2020" (Methods).
9	No	No explicit statement on consecutive, random, or convenience sampling.

10a	Yes	Index tests (sCysC, sNGAL) described in detail: assays, instruments, procedures (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI based on sCr, including baseline determination (Methods).
11	No	No explicit rationale for choosing KDIGO over alternatives.
12a	Yes	Pre-specified cut-offs for sCysC and sNGAL cited from prior studies (Methods/Outcomes).
12b	Yes	KDIGO criteria for AKI stages (pre-specified cut-offs) used (Methods).
13a	No	No information on whether clinical/reference data were available to index test performers.
13b	No	No information on whether clinical/index test results were available to reference standard assessors.
14	Yes	ROC curves and AUCs with 95% CIs reported (Results/Abstract).
15	No	No mention of handling indeterminate index/reference test results.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	"pilot, hypothesis-generating study" with no sample size justification (Statistical Analysis).
19	No	No participant flow diagram in the main text (STROBE supplement not provided).
20	Yes	Table 1 reports baseline demographics and clinical characteristics.
21a	No	Severity distribution (e.g., AKI stages) not detailed in the main text (supplemental data referenced but unavailable).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (ED presentation) and reference standard (AKI diagnosis) not specified.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	AUCs with 95% confidence intervals reported (Abstract/Results).
25	No	No mention of adverse events from index/reference tests.
26	Yes	Limitations discussed: small sample size, single-center design (Conclusions).
27	Yes	Implications for practice: recommends biomarker measurement for risk stratification (Conclusions).
28	No	No trial registration number or registry name provided.
29	No	No statement on protocol accessibility.
30	No	Funding sources not specified in the provided text; declarations of interest state "none."

Zhang 2024

Item No.	Assessment	Support for Assessment
1	Yes	"assessed the early predictive value of suPAR for S-AKI patients using receiver operating characteristic (ROC) curves" (Abstract) – Mentions AUC, sensitivity, and specificity.

2	Yes	Structured abstract with "Background", "Methods", "Results", and "Conclusions" sections.
3	Yes	"intended use and clinical role" described in Introduction: suPAR as a potential biomarker for early S-AKI diagnosis.
4	Yes	Objectives stated: "assessed the early predictive value of suPAR for S-AKI patients" (Abstract). Hypothesis: "suPAR could be used to predict the course of S-AKI" (Introduction).
5	Yes	"prospective observational study" (Methods) – Data collection planned before index/reference tests.
6	Yes	Inclusion/exclusion criteria listed: sepsis-3 criteria, age ≥18, exclusion of CKD, etc. (Methods).
7	Yes	Basis for eligibility: "fulfilled the criteria for sepsis-3" (Methods).
8	Yes	Setting: ICU of Henan Provincial People's Hospital; dates: Jan 2022–Mar 2023 (Methods).
9	Yes	"patients were consecutively selected" (Methods).
10a	Yes	Index test details: plasma suPAR measured at 0-, 12-, 24-, 48-h using ELISA kit (Methods).
10b	Yes	Reference standard: KDIGO criteria for AKI (Methods).
11	No	No rationale provided for choosing KDIGO criteria over alternatives.
12a	Yes	Cut-off defined: ≥6.31 ng/mL at 24-h (Youden's statistic; Results).
12b	No	No rationale for KDIGO criteria cut-offs (pre-specified vs. exploratory).
13a	Unclear	Not explicitly stated whether reference standard results were available to suPAR testers.
13b	Unclear	Not explicitly stated whether suPAR results were available to KDIGO assessors.
14	Yes	"ROC curves" and "logistic regression" used for accuracy estimation (Methods).
15	No	No mention of handling indeterminate test results.
16	No	No description of missing data handling.
17	No	No analyses of variability in diagnostic accuracy.
18	No	No sample size calculation or justification provided.
19	Yes	Flowchart provided (Figure 1).
20	Yes	Baseline demographics/clinical characteristics in Table 1.
21a	Yes	Severity distribution: AKI stages 1-3 described (Results).
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals: suPAR measured at 0-, 12-, 24-, 48-h; AKI assessed within 7 days (Methods).
23	Yes	Cross-tabulation implied in ROC analysis (Table 3, Figure 2).
24	Yes	AUC 0.700 (95% CI: 0.621–0.779) with sensitivity/specificity reported (Results).
25	No	No adverse events mentioned.
26	Yes	Limitations discussed: single-center design, lack of mechanistic insights (Discussion).
27	Yes	Implications stated: suPAR as a potential biomarker for early S-AKI (Abstract/Conclusions).
28	Yes	"ChiCTR2300072045" registration number provided (Methods).

29	No	No protocol accessibility statement.
30	Yes	Funding sources: Natural Science Foundation of China; role of funders declared (Supplemental Data).

Hoste 2014

Item No.	Assessment	Support for Assessment
1	Yes	"sensitivity was 89% in both studies, and specificity 50 and 53%" (Results). Explicitly reports sensitivity and specificity.
2	Yes	Structured abstract with "Background," "Methods," "Results," and "Conclusions" sections.
3	Yes	"intended use and clinical role" discussed: "identify patients at high risk...to support clinical decision-making" (Abstract) and "kidney-sparing management strategies" (Methods).
4	Yes	Objectives stated: "development, diagnostic accuracy and verification of two cutoff values" (Introduction).
5	Yes	"prospectively set two clinical cutoff values" (Methods), indicating prospective data collection planning.
6	Yes	Eligibility criteria: "≥21 years, admitted to ICU within 24 h, expected to remain in ICU with urinary catheter ≥48 h" (Subjects).
7	Yes	Basis for identification: "critically ill patients" admitted to ICU (Subjects).
8	Yes	"35 sites in North America and Europe" (Sapphire) and "six sites in the USA" (Opal) with enrollment dates specified (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Index test details: "urinary [TIMP-2]•[IGFBP7] measured via NephroCheck® Test" (Methods).
10b	Yes	Reference standard: KDIGO AKI staging based on serum creatinine and urine output (Clinical End Points).
11	No	Rationale for KDIGO as reference standard not explicitly discussed (alternatives not mentioned).
12a	Yes	Pre-specified cutoffs (0.3 and 2.0) with rationale: "high sensitivity" and "high specificity" (Clinical Cutoff Selection).
12b	Yes	KDIGO criteria defined as pre-specified reference standard (Clinical End Points).
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"ROC curves, sensitivity, specificity, relative risk, 95% CI" (Statistical Analysis).
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	One subject excluded due to loss to follow-up but no detailed missing data methods.
17	No	No analyses of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No justification for intended sample size (e.g., power calculation).
19	Yes	Participant flow diagram provided (Figure 1).
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	No distribution of disease severity in patients with AKI (target condition).

21b	No	No distribution of alternative diagnoses in patients without AKI.
22	No	Time interval between index test and reference standard not explicitly stated.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	"sensitivity 89%...specificity 50%...95% confidence intervals" (Results).
25	No	No adverse events reported from index or reference tests.
26	Yes	Limitations: "study protocols were approved by investigational review boards" but no explicit discussion of biases.
27	Yes	"provide new information to support clinical decision-making" (Conclusions).
28	Yes	Registration numbers: NCT01209169 (Sapphire) and NCT01846884 (Opal) (Abstract).
29	No	No statement on where the full study protocol can be accessed.
30	Yes	"Sources of funding...Astute Medical" (Laboratory Methods) and sponsor role described.

Matsui 2012

Item No.	Assessment	Support for Assessment
1	Yes	"The biomarker with the largest area under the curve at every time point for predicting the onset of AKI was urinary L-FABP." (Results section; AUC used as a measure of accuracy).
2	Yes	Abstract includes structured sections: Background, Methods and Results, Conclusions.
3	Yes	Introduction explains AKI's clinical importance, limitations of SCr, and rationale for urinary L-FABP as a biomarker.
4	Yes	"The aim of the present study was to evaluate the utility of urinary L-FABP compared with other urinary biomarkers..." (Abstract).
5	Yes	"Patients were prospectively studied from August 2009 to October 2010." (Methods).
6	Yes	Exclusion criteria: chronic dialysis, emergency operations, deaths within 24h (Methods: Patient Selection).
7	Yes	Participants identified based on undergoing cardiac surgery (Methods: Patient Selection).
8	Yes	"Department of Cardiovascular Surgery, St Marianna University... from August 2009 to October 2010." (Methods).
9	No	No mention of consecutive, random, or convenience sampling in enrollment.
10a	Yes	ELISA method for urinary L-FABP described (Methods: Enzyme-Linked Immunosorbent Assay).
10b	Yes	AKIN criteria defined with SCr thresholds (Methods: Definition of AKI).
11	No	No explicit rationale for choosing AKIN over RIFLE or other criteria.
12a	No	Cut-offs for L-FABP determined via ROC analysis; no pre-specified thresholds mentioned.
12b	Yes	AKIN criteria use pre-defined SCr cut-offs (≥0.3 mg/dl or 1.5-fold increase).
13a	No	No information on whether clinical data or reference standard results were available during index test interpretation.
13b	No	No information on blinding of reference standard assessors to index test results.

14	Yes	"Receiver-operating characteristic curves (ROCs)... AUC calculated" (Methods: Statistical Analysis).
15	No	No mention of handling indeterminate results (e.g., missing samples or ambiguous test outcomes).
16	No	No description of missing data management.
17	No	No analysis of variability in diagnostic accuracy measures.
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram included.
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	Yes	AKI severity distribution: 39 stage 1, 4 stage 2, 5 stage 3 (Results).
21b	No	No distribution of alternative diagnoses in non-AKI participants.
22	Yes	Urine and serum samples collected concurrently at specified time points (Methods).
23	No	No 2x2 contingency table comparing index test and reference standard results.
24	No	AUC values reported without 95% confidence intervals (e.g., "AUC of 0.90–1.0").
25	No	No adverse events reported from tests.
26	Yes	Limitations discussed: single-center, small sample size, lack of long-term outcomes (Discussion).
27	Yes	"Urinary L-FABP is a useful biomarker for early detection of AKI..." (Conclusions).
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	"CMIC Co Ltd, Tokyo (T.S.), Japan" (Affiliations) and ELISA kit provided by CMIC (Methods).

Nickolas 2012

Item No.	Assessment	Support for Assessment
1	Yes	"81% specificity, 68% sensitivity at a 104-ng/ml cutoff" (Abstract). Explicitly reports sensitivity and specificity.
2	Yes	Structured abstract includes "Objectives," "Background," "Methods," "Results," and "Conclusion" sections.
3	Yes	Background discusses AKI limitations, biomarkers' role, and intended use for "diagnostic and prognostic stratification" (Abstract, Background).
4	Yes	Objectives state: "aimed to determine the diagnostic and prognostic value of urinary biomarkers" (Abstract).
5	Yes	"multicenter prospective cohort study" (Methods). Data collection planned before index/reference tests.
6	No	Eligibility criteria mentioned ("older than 18 years," exclusion of short follow-up/dialysis patients) but lacks full details (e.g., comorbidities, clinical presentation).
7	No	"unselected ED patients" (Methods). No explicit basis (e.g., symptoms, prior tests) for identifying participants.
8	Yes	Specifies three centers and enrollment dates: "September 2008 to March 2009" (Methods).

9	Yes	"recruiting study personnel enrolled all available patients" (Methods), implying consecutive enrollment.
10a	Yes	Index tests (biomarkers) described in "Laboratory measurements" with assay methods and platforms.
10b	Yes	Reference standard includes RIFLE criteria and adjudication process: "diagnostic categorization... blinded to biomarker levels" (Methods).
11	No	Uses RIFLE criteria but lacks rationale for choosing it over alternatives (e.g., AKIN).
12a	Yes	Pre-specified cutoffs (e.g., "104-ng/ml cutoff") with ROC analysis (Results).
12b	No	RIFLE criteria used but no rationale for its cutoffs or alternatives.
13a	Yes	"adjudicators... blinded to urinary biomarker levels" (Methods). Clinical data available, but reference standard blinded.
13b	No	No mention of whether biomarker results were available to reference standard assessors.
14	Yes	"AUC-ROC analysis," sensitivity, specificity, and confidence intervals (Results).
15	No	No description of handling indeterminate index/reference test results.
16	No	No mention of missing data handling.
17	No	No analyses of variability in diagnostic accuracy.
18	Yes	"Sample sizes were estimated based on previous data" (Statistics).
19	No	No participant flow diagram.
20	Yes	"Baseline demographic and clinical characteristics" reported (Results).
21a	No	No distribution of disease severity in iAKI patients.
21b	No	No distribution of alternative diagnoses in non-iAKI patients.
22	No	No time interval between index test (biomarker) and reference standard (RIFLE/adjudication).
23	No	No cross-tabulation (2x2 table) of index vs. reference results.
24	Yes	"68% sensitivity... 95% confidence intervals" (Abstract).
25	No	No mention of adverse events from biomarker testing.
26	Yes	Limitations discussed: single urine sample, lack of biomarker validation in clinical practice (Conclusion).
27	Yes	"implications for practice... prognostic stratification" (Abstract).
28	No	No registration number or registry name.
29	No	No mention of study protocol accessibility.
30	Yes	Funding: "NIH Public Access," Abbott Laboratories (Author affiliations).

He 2024

Item No.	Assessment	Support for Assessment
1	Yes	"IL-8 was more effective as a biomarker [...] sensitivity = 92.6%, specificity = 51.1%." (Abstract) Explicitly reports sensitivity and specificity.
2	Yes	Structured abstract includes Objectives, Methods, Results, and Conclusions.

3	Yes	Introduction describes limitations of current AKI biomarkers and clinical role of IL-8.
4	Yes	"Our study attempted to evaluate the diagnostic value of chemokines for early-stage PS-AKI prediction." (Abstract)
5	No	No statement on whether data collection was prospective or retrospective.
6	Yes	Inclusion/exclusion criteria listed under "Participants."
7	Yes	Participants identified based on KDIGO criteria (stage 2/3 AKI) and COVID-19 pneumonia.
8	Yes	"Recruited [...] from the intensive care unit between December 2022 and February 2023."
9	No	No mention of consecutive, random, or convenience sampling.
10a	Yes	"Cytometric Bead Array [...] to detect patient plasma levels [...] IL-8 [...] within 24 h of enrollment." (Methods)
10b	Yes	Reference standard: KDIGO criteria with PS-AKI defined as stage 3 AKI ≥72h.
11	No	No rationale provided for selecting KDIGO as reference standard.
12a	Yes	"Cutoffs [...] selected according to the highest AUC [...] IL-8 >32.2 pg/ml." (Results)
12b	Yes	KDIGO staging criteria for AKI explicitly defined.
13a	No	Unclear if reference standard results were blinded to index test assessors.
13b	No	Unclear if index test results were blinded to reference standard assessors.
14	Yes	"ROC curve helped analyze [...] AUC [...] sensitivity [...] specificity." (Methods)
15	No	No description of handling indeterminate/missing test results beyond exclusion criteria.
16	No	No mention of missing data handling methods.
17	No	No variability analyses reported.
18	No	No sample size justification or power calculation.
19	Yes	Flow diagram provided (Figure 1).
20	Yes	Baseline demographics and clinical characteristics in Table 1.
21a	No	No distribution of disease severity in PS-AKI group.
21b	No	No distribution of alternative diagnoses in Non-PS-AKI group.
22	Yes	"Median time between sample sampling and diagnosis was two days." (Results)
23	No	No 2x2 contingency table showing test vs reference standard results.
24	Yes	"AUC 0.769 (0.675-0.863)" with 95% CI reported.
25	No	No adverse events reported.
26	Yes	"These findings should be validated in further studies with larger sample size." (Conclusion)
27	Yes	"Plasma IL-8 is a promising marker for early identification of PS-AKI." (Abstract)
28	No	No registration number or registry name provided.
29	No	No protocol accessibility statement.
30	Yes	Funding: "This work was supported by the National Natural Science Foundation of China [82070734]." (Supplemental data link)

Lima 2022

Item No.	Assessment	Support for Assessment
1	Yes	"AUC of 0.69 (CI 0.54–0.83), a cutoff of 55.30 pmol/l, a sensitivity of 0.86, a specificity of 0.52, and an accuracy of 0.75." (Abstract)
2	Yes	Structured abstract includes study design, methods, results, and conclusions. (Abstract)
3	Yes	"AKI is a common complication after LT... PENK was indicated as a promising filtration biomarker." (Introduction)
4	Yes	"We hypothesized that PENK... could be a prognostic tool to determine the severity of AKI." (Abstract & Introduction)
5	Yes	"During a 24-month period... patients were screened... blood samples were collected preoperatively and 48 h after LT." (Methods: Patients)
6	Yes	"Exclusion criteria: age <18 years, preoperative dialysis, combined transplants, CKD stage 5." (Methods: Patients)
7	Yes	"All planned liver transplant recipients... were screened prior to surgery." (Methods: Patients)
8	Yes	"University of Sao Paulo, Brazil... June 2013 through June 2015." (Methods: Patients)
9	Yes	"All planned liver transplant recipients... screened" implies a consecutive series. (Methods: Patients)
10a	Yes	"Blood samples were centrifuged... Sphingotest® penKid® immunoassay kit... measured by immunoluminometric assay." (Methods: Biomarker collection)
10b	Yes	"AKI diagnosis based on KDIGO criteria: changes in serum creatinine." (Methods: Clinical outcomes)
11	Yes	"Urine output is not recommended by ICA... diagnosis based on serum creatinine." (Introduction)
12a	No	Cutoffs determined post-hoc via Youden index: "optimal cutoffs were determined by... AUC (Youden index)." (Methods: Statistical analysis)
12b	Yes	KDIGO criteria (predefined Scr thresholds) used for reference standard. (Methods: Clinical outcomes)
13a	Yes	"All measured biomarkers were blinded to the investigators." (Methods: Biomarker collection)
13b	No	No explicit statement on blinding reference standard assessors to index test results.
14	Yes	"ROC curves... AUC, sensitivity, specificity, accuracy reported." (Methods: Statistical analysis)
15	No	No description of handling indeterminate/missing index test or reference standard results.
16	No	No explicit methods for handling missing data mentioned.
17	No	No analyses of variability in diagnostic accuracy reported.
18	No	No sample size calculation or power analysis described.
19	No	No participant flow diagram provided.
20	Yes	"Demographic and clinical characteristics of participants" in Table 1.
21a	No	Severity distribution (e.g., KDIGO stages) not fully stratified beyond "severe AKI."
21b	No	No distribution of alternative diagnoses in non-AKI participants described.
22	No	Time interval between index test and reference standard not explicitly addressed.
23	No	No cross-tabulation of index test vs. reference standard results (e.g., 2x2 table).

24	Yes	"AUC of 0.83 (CI 0.72–0.94)... sensitivity of 0.81, specificity of 0.90." (Results)
25	No	No mention of adverse events from PENK or reference standard.
26	Yes	"Small study... single-center design" discussed as limitations. (Discussion)
27	Yes	"Combination of BMs may aid in management and prevention of AKI progression." (Abstract)
28	Yes	"Registered at ClinicalTrials.gov (NCT02095431)." (Abstract footnote)
29	No	No explicit link or statement about accessing the full study protocol.
30	No	No funding sources or role of funders declared in the provided text.

Ghonemy 2014

Item No.	Assessment	Support for Assessment
1	Yes	"The sensitivity and specificity of NGAL at 3 h post-operative was 94.1% and 93.9% respectively..." (Explicit use of diagnostic accuracy measures).
2	Yes	Abstract includes structured sections: Objective, Methods, Results, Conclusions.
3	Yes	Introduction explains AKI's clinical significance and the need for early biomarkers, outlining the intended role of NGAL/CysC.
4	Yes	"The objective of this work is to evaluate...NGAL and CysC as early predictors of AKI..." (Clear objectives).
5	Yes	"Single-center prospective observational study..." (Prospective design stated).
6	Yes	Inclusion/exclusion criteria detailed: e.g., exclusion of patients with renal disease, diabetes, etc.
7	Yes	Participants identified based on undergoing cardiac surgery (CABG or valve replacement).
8	Yes	"Zagazig University Hospital...between June 2009 and June 2011" (Setting and dates provided).
9	No	No mention of consecutive, random, or convenience sampling in recruitment.
10a	Yes	Index tests (NGAL/CysC) described with ELISA methodology and sampling times.
10b	Yes	Reference standard: Serum creatinine using RIFLE criteria (defined as ≥25% rise or ≥0.3 mg/dL).
11	No	No explicit rationale for choosing RIFLE over other AKI definitions (e.g., KDIGO).
12a	No	Cut-offs for NGAL/CysC (e.g., 62 ng/mL for NGAL) mentioned in results but not pre-specified in methods.
12b	Yes	Reference standard positivity defined by pre-specified RIFLE criteria.
13a	No	No information on whether clinical data/reference results were available to NGAL/CysC assessors.
13b	No	No information on whether NGAL/CysC results were available to creatinine assessors.
14	Yes	"Sensitivity, specificity, PPV, NPV were determined" (Methods for accuracy measures described).
15	No	No mention of indeterminate/missing index or reference test results.
16	No	No discussion of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No justification for sample size (n=50) or power calculation.

19	No	No participant flow diagram provided.
20	Yes	Baseline demographics (age, gender, creatinine) reported in Table 1.
21a	No	Severity distribution of AKI (e.g., RIFLE stages) not described.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	Yes	Time intervals between index tests (3, 6, 24h) and reference standard (24h) specified.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	No	Sensitivity/specificity reported without confidence intervals (e.g., "94.1% and 93.9%").
25	No	No adverse events from NGAL/CysC or creatinine testing mentioned.
26	Yes	Limitations noted: single-center, small sample size, lack of long-term outcomes.
27	Yes	Conclusion states "plasma NGAL and CysC may be considered as early predictors..." (Clinical implications).
28	No	No registration number or registry name provided.
29	No	No mention of a publicly available study protocol.
30	No	No funding sources or conflicts of interest declared.

Safadi 2024

Item No.	Assessment	Support for Assessment
1	Yes	"The C-statistic of uNGAL and IGFBP7-TIMP2... for AKI prediction were 0.56, 0.54, and 0.53" (Abstract). Explicit use of AUC (C-statistic) as a diagnostic accuracy measure.
2	Yes	Structured abstract includes "Background," "Aim," "Methods," "Results," and "Conclusion" sections (Abstract).
3	Yes	Introduction details AKI's clinical significance, FDA-approved biomarkers, and their intended role in non-critically ill populations (Introduction).
4	Yes	"Aim of this study was to determine the performance... in early detection of AKI" (Abstract).
5	Yes	"Prospective observational study" with data collection planned before index/reference tests (Methods).
6	Yes	Inclusion criteria: non-critically ill patients with AKI risk ≥5%, ED admission, and urine samples (Methods: "Study design and patient selection").
7	Yes	Patients identified based on symptoms (AKI risk model), prior ED tests (creatinine/urinalysis), and registry inclusion (Methods).
8	Yes	"Mayo Clinic Hospitals in Rochester, Minnesota, USA... between October 31st, 2016 and May 1st, 2018" (Methods).
9	No	No explicit mention of consecutive, random, or convenience sampling; selection relied on risk scores and sample availability.
10a	Yes	Index tests (uNGAL, IGFBP7-TIMP2) described with assay methods (Roche COBAS, NephroCheck®) and units (Data source).
10b	Yes	Reference standard: KDIGO AKI criteria using serum creatinine changes (Definitions and outcomes).
11	No	No rationale provided for choosing KDIGO over other AKI definitions.
12a	Yes	Predefined cutoffs for biomarkers: uNGAL >23.4/65 ng/mL (gender-specific), IGFBP7-TIMP2 >0.3/>2.0 with cited references (Methods).

12b	No	KDIGO criteria defined but no rationale for creatinine-based cutoffs (e.g., why 1.5× baseline).
13a	No	No mention of blinding index test readers to reference standard results or clinical data.
13b	No	No mention of blinding reference standard assessors to index test results.
14	Yes	"C-statistic... for AKI prediction" and logistic regression for mortality (Statistical analyses).
15	No	No description of handling indeterminate biomarker or KDIGO results.
16	Yes	Baseline creatinine imputed from admission values if missing (Data source).
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	"A power calculation... suggested a sample size of 323" (Methods).
19	Yes	Flow diagram included (Fig. 1).
20	Yes	Baseline demographics and clinical characteristics reported (Table 1).
21a	No	AKI severity (stages 1–3) reported but no distribution of comorbidities in AKI group.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No mention of time interval between biomarker measurement and AKI diagnosis.
23	No	No cross-tabulation of biomarker results vs. KDIGO outcomes (only C-statistics provided).
24	No	C-statistics reported without 95% confidence intervals (e.g., "C-statistic... 0.56").
25	No	No adverse events reported from biomarker testing.
26	Yes	Limitations discussed: single-center design, imputed baseline creatinine, modest biomarker performance (Discussion).
27	Yes	"Potential impact" section discusses clinical role of biomarkers for risk stratification (Key learning points).
28	No	No registration number or registry name provided.
29	No	No statement about protocol accessibility.
30	Yes	"Sources of funding and other support" acknowledged (End of article).

Akalya 2022

Item No.	Assessment	Support for Assessment
1	Yes	"Urinary TIMP2 and IGFBP7 predict drug-induced AKI with a lead-time of 2-3 days... AUROC of 0.81" (Reports AUC as a diagnostic accuracy measure).
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusion.
3	Yes	"Drug-induced nephrotoxicity... need to improve clinical surveillance" (Describes clinical role of biomarkers).
4	Yes	"We hypothesized that urinary TIMP2 and IGFBP7... would be elevated by days prior to... AKI" (Explicit hypothesis).
5	Yes	"Prospective study... serial urine collection" (Data collected before AKI onset).

6	Yes	"Inclusion criteria... Exclusion criteria" (Lists eligibility criteria).
7	Yes	"Patients in receipt of these drugs were identified daily from electronic inpatient medication records" (Basis for eligibility).
8	Yes	"Tertiary healthcare institution... November 2014 till October 2018" (Setting and dates).
9	No	No mention of consecutive, random, or convenience sampling method.
10a	Yes	"Urinary TIMP2 and IGFBP7 measured using quantitative immunoassays... assay ranges/LOD described" (Replicable index test details).
10b	Yes	"KDIGO criteria... 50% or 26.5 µmol/L sCr rise" (Replicable reference standard).
11	Yes	"KDIGO is the accepted clinical standard for AKI diagnosis" (Implied rationale for reference standard).
12a	No	Cut-offs (e.g., >0.01 $(ng/mL)^2/1000$) derived post-hoc via ROC analysis; no pre-specified thresholds.
12b	Yes	KDIGO criteria are pre-defined and non-exploratory.
13a	No	No information on blinding of index test assessors to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"AUROC... sensitivity... specificity... 95% confidence intervals" (Methods for accuracy estimation).
15	No	No mention of handling indeterminate test results.
16	Yes	"No imputation was done... excluded during analysis" (Describes missing data handling).
17	No	No analysis of variability in diagnostic accuracy.
18	Yes	"Sample size estimation... 135 patients to provide 20 AKI cases" (Sample size justification).
19	No	No participant flow diagram (mentioned Supplementary Table 1 only).
20	Yes	"Baseline demographics... comparable between groups" (Table of characteristics).
21a	No	No distribution of disease severity in AKI patients (only KDIGO staging).
21b	No	No distribution of alternative diagnoses in non-AKI controls.
22	Yes	"Time interval... 2-3 days before AKI onset" (Reports timing between tests).
23	Yes	"Cross tabulation" implied via AUROC analysis; biomarker levels vs. KDIGO status.
24	Yes	"AUROC 0.81... 95% confidence intervals... sensitivity 79%, specificity 60%" (Accuracy estimates with precision).
25	No	No mention of adverse events from biomarker testing.
26	Yes	"Study limitations... small sample size... single-center design" (Limitations discussed).
27	Yes	"Implications for practice... window for pre-emptive interventions" (Clinical relevance stated).
28	No	No registration number or registry name provided.
29	No	No statement about protocol accessibility.
30	Yes	"Approved by Human Research Ethics Committee... sources of funding not explicitly stated but institutional affiliations provided."

Hanson 2011

Item No.	Assessment	Support for Assessment
1	Yes	"The plasma creatinine level had the greatest area under the ROC curve (AUC): 0.83 (95% confidence interval 0.74-0.92)" – Explicit use of AUC for diagnostic accuracy.
2	Yes	Structured abstract includes background, methods, results, and conclusions under "Abstract."
3	Yes	Background describes clinical role of predicting RRT requirement in severe malaria: "Earlier identification of patients who will need RRT may improve outcomes."
4	Yes	Objectives stated: "The aim of this study was to assess the ability of these tests... to predict a later requirement for RRT."
5	Yes	"Prospectively collected data from two intervention studies" – Prospective data collection.
6	Yes	Eligibility criteria defined: "All patients had to satisfy pre-specified criteria for severe malaria (Table 2)."
7	Yes	Participants identified based on symptoms and test results: "asexual forms of P. falciparum on a blood film" and severe malaria criteria (Table 2).
8	Yes	"The study was conducted at Chittagong Medical College Hospital, Bangladesh... between 2003 and 2007."
9	No	No explicit mention of consecutive, random, or convenience sampling.
10a	Yes	Index tests (e.g., plasma creatinine, urinary NGAL) described in detail: formulas in Table 1 and laboratory methods.
10b	Yes	Reference standard defined: "retrospective assessment determined by three independent reviewers" using pre-defined criteria (Table 3).
11	No	No rationale provided for choosing the retrospective review as the reference standard over alternatives.
12a	No	Cut-offs for index tests (e.g., RFI, FeNa) referenced from prior literature (Table 1), but not explicitly stated as pre-specified for this study.
12b	Yes	Pre-defined criteria for RRT (Table 3) used as reference standard cut-offs.
13a	Yes	"None of the measures of ATN/AKI were available to the treating clinicians" – No access to reference standard results during index test analysis.
13b	Yes	Retrospective reference standard assessment implies index test results were unavailable to reviewers during decision-making.
14	Yes	ROC curves and AUC used: "performance of the tests was assessed using ROC curves."
15	No	No mention of handling indeterminate index test or reference standard results.
16	No	Exclusion of 21 patients due to insufficient data, but no explicit method for handling missing data described.
17	No	Variability in accuracy (e.g., AUC comparisons) analyzed, but no distinction between pre-specified and exploratory analyses.
18	No	No sample size calculation or justification provided.
19	Yes	Participant flow described in Figure 1.
20	Yes	Baseline demographics and clinical characteristics in Table 4.
21a	No	Severity distribution in patients requiring RRT not detailed.
21b	No	No distribution of alternative diagnoses in non-RRT patients.
22	No	Time interval between index test and reference standard application not explicitly stated.
23	No	No cross-tabulation (2x2 table) of index test vs. reference standard results.
24	Yes	AUC estimates with 95% CIs reported: e.g., "AUC: 0.83 (95% CI 0.74-0.92)."

25	No	No adverse events from index or reference tests mentioned.
26	No	Limitations section absent; generalizability and bias not discussed.
27	Yes	Implications for practice: "In adult patients... plasma creatinine level [is sufficient] to predict... RRT requirement."
28	No	No trial registration number or registry name provided.
29	No	No mention of a publicly accessible study protocol.
30	Yes	Funding sources declared: "Sources of funding... OXTREC... ethics committees."

Wagener 2011

Item No.	Assessment	Support for Assessment
1	Yes	"The area under the curve of the receiver operator characteristics curve of urinary NGAL/urine creatinine ratio to predict AKI was 0.800 (95% CI: 0.732–0.869, P < 0.0001)" (Abstract, Results). Explicitly reports AUC, sensitivity (83.5%), and specificity (67.5%).
2	Yes	Structured abstract with "Background," "Methods," "Results," and "Conclusions" sections (Abstract).
3	Yes	Introduction describes clinical relevance of AKI post-liver transplantation and NGAL's role as a biomarker. States NGAL's "intended use" for early AKI prediction (Introduction).
4	Yes	"We hypothesized that urinary NGAL can predict AKI after liver transplantation" (Abstract, Background).
5	Yes	"Urine was collected [...] before surgery, after reperfusion [...] and then 3, 18 and 24 h later" (Methods). Prospective data collection.
6	Yes	Inclusion: Adult liver transplant patients. Exclusion: Preoperative renal failure requiring dialysis (Subjects and Methods).
7	No	No description of how participants were identified (e.g., symptoms, prior tests). States eligibility but lacks specifics on identification basis.
8	Yes	"Columbia University Medical Center" and dates: "2 August 2008 to January 2010" (Subjects and Methods).
9	No	No mention of consecutive, random, or convenience sampling. Likely convenience sampling but not explicitly stated.
10a	Yes	Detailed NGAL measurement: ELISA method, urine processing, normalization to creatinine (Methods).
10b	Yes	Reference standard: RIFLE criteria for AKI ("increase of serum creatinine by >50%") (Methods).
11	No	No rationale provided for choosing RIFLE over other AKI definitions (e.g., KDIGO).
12a	Yes	Pre-specified RIFLE-risk cutoff (50% serum creatinine increase) (Methods). No exploratory cutoffs mentioned.
12b	No	RIFLE criteria for reference standard are defined but rationale for thresholds (e.g., 50%) is not discussed.
13a	No	No information on blinding of index test performers to reference standard results.
13b	No	No information on blinding of reference standard assessors to index test results.
14	Yes	"Area under the ROC curve" and statistical methods for accuracy (Methods, Results).
15	No	No description of handling indeterminate index test or reference standard results.
16	No	No mention of missing data handling for NGAL or serum creatinine.

17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	No	No sample size justification or power calculation provided.
19	No	No participant flow diagram.
20	Yes	Table 1 reports demographics, diagnoses, and clinical characteristics.
21a	No	No distribution of AKI severity (e.g., RIFLE stages beyond "risk").
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	Time interval between index test (NGAL) and reference standard (serum creatinine) not explicitly addressed.
23	No	No cross-tabulation (2x2 table) of NGAL results vs. RIFLE outcomes.
24	Yes	AUC estimates with 95% CIs and P-values (Results, Figure 3).
25	No	No adverse events from NGAL or serum creatinine testing reported.
26	Yes	Limitations: Single-center study, small sample size, lack of urine output criteria (Discussion).
27	Yes	"Urinary NGAL [...] is able to predict post-OP AKI [...] with good discrimination" (Abstract, Conclusions).
28	No	No registration number or registry name provided.
29	No	No mention of study protocol availability.
30	Yes	Funding: Irving Institute for Clinical and Translational Research (Methods). Role of funders not specified.

Pilarczyk 2015

Item No.	Assessment	Support for Assessment
1	Yes	"The diagnostic accuracy of [TIMP 2]*[IGFBP7]... (sensitivity 0.89, specificity 0.81, AUC 0.817...)." Explicitly reports sensitivity, specificity, and AUC.
2	Yes	Abstract includes structured sections: Background, Methods, Results, Conclusions.
3	Yes	Background discusses AKI's clinical significance, limitations of serum creatinine, and the intended role of [TIMP-2]*[IGFBP7] as an early biomarker.
4	Yes	"It was the aim... to evaluate two new urinary biomarkers... for early prediction of AKI." States objective and hypothesis.
5	Yes	"In a prospective cohort study..." Data collection was planned before index/reference tests.
6	Yes	"60 consecutive patients... scheduled for elective on-pump CABG... inclusion criteria: minimum age 18 years."
7	Yes	Participants identified based on "severe coronary artery disease" requiring CABG (clinical indication).
8	Yes	"Recruited... between January 2014 and October 2014" at West German Heart and Vascular Center Essen.
9	Yes	"60 consecutive patients..." explicitly stated.
10a	Yes	"Urine samples collected every 12 h... analyzed with NephroCheck™ Test." Sufficient detail for replication.
10b	Yes	Reference standard: KDIGO criteria for AKI staging (serum creatinine/urine output), defined in Methods.
11	Yes	Background justifies KDIGO as the current "gold standard" despite limitations.

12a	No	Cut-off (0.817) determined via ROC analysis; no pre-specified rationale provided in Methods.
12b	Yes	KDIGO criteria for AKI staging (pre-specified thresholds for creatinine/urine output).
13a	Yes	"Physicians... blinded for biomarker levels." Reference standard results unavailable to index test performers.
13b	Yes	"Laboratory investigators blinded to clinical outcomes." Index test results unavailable to reference standard assessors.
14	Yes	"ROC curve... sensitivity, specificity, AUC, 95% CI" calculated using standard methods.
15	No	No mention of handling indeterminate index/reference test results.
16	No	No explicit description of missing data handling.
17	No	No analysis of variability in diagnostic accuracy (e.g., subgroup analyses).
18	Yes	"Sample size calculation... based on prior data (power analysis, α=0.05, power=0.9)."
19	Yes	Figure 1: CONSORT flow diagram provided.
20	Yes	Table 2: Baseline demographics and clinical characteristics reported.
21a	Yes	Table 1: AKI severity distribution (stages 1–3) reported.
21b	No	No distribution of alternative diagnoses in non-AKI patients.
22	No	No explicit mention of time intervals or interventions between index test and reference standard.
23	No	No 2x2 contingency table; only sensitivity/specificity/AUC reported.
24	Yes	"AUC 0.817, 95% CI 0.622–1.0... sensitivity 0.89, specificity 0.81."
25	No	No adverse events from biomarker testing or reference standard mentioned.
26	Yes	Limitations: Small sample size, need for larger validation study.
27	Yes	Conclusion states "[TIMP-2]*[IGFBP7] represents a sensitive and specific biomarker... for early prediction."
28	No	No registration number or registry name provided.
29	No	No mention of protocol availability.
30	Yes	"Competing interests" section: NephroCheck™ kits provided by Astute Medical; no direct funding stated.

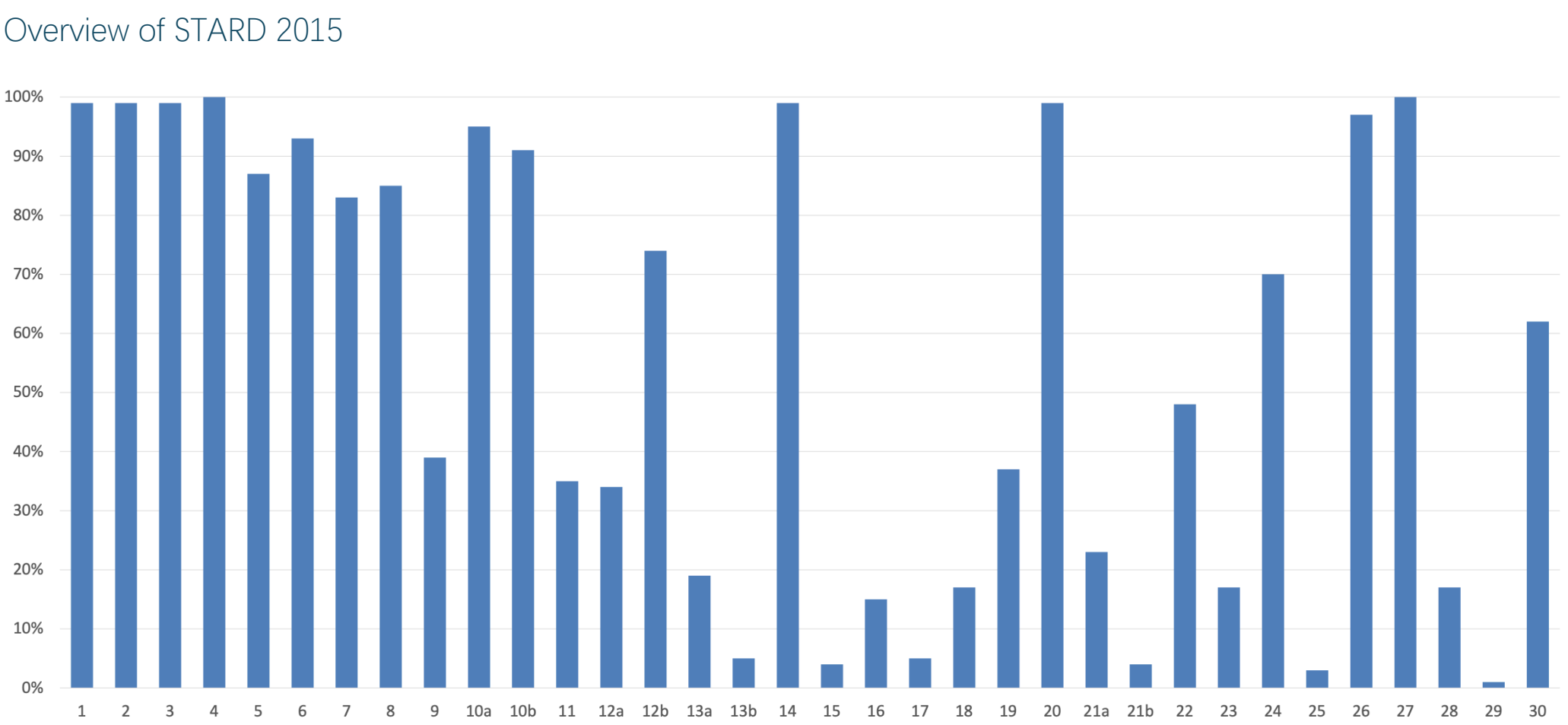


Figure S 3 STARD 2015 assessing results.

Demographic Characteristics of included trials

Table S 5 Demographic characteristics of included trials.

Study	Dis	NDis	Total	Index	cutoff	Ref	Tsample	Tevent
Shakked 2022[1]	22	30	52	sCysC	1.27 mg/L	KDIGO	ED ad	hos st
	22	30	52	sNGAL	120 ng/L	KDIGO	ED ad	hos st
Ergun 2022[2]	13	47	60	sNGAL	71.80 ng/mL	KDIGO	postop-6h	hos st
Pilarczyk 2022[3]	27	74	101	u[TIMP2][IGFBP7]	0.21 (ng/ml)2/1000	KDIGO	postop-4h	postop-2d
	13	88	101	u[TIMP2][IGFBP7]	0.265 (ng/ml)2/1002	KDIGO	postop-2h	postop-2d
Okuda 2022[4]	10	38	48	uLFABPuCr	32.6 ug/g	KDIGO	postop-72h	postop-7d
Pei 2022[4]	60	102	162	sCysC	10.4 ug/mL	KDIGO	ED ad	hos-7d
	60	102	162	sNGAL	95.6 ng/mL	KDIGO	ED ad	hos-7d
	60	102	162	sKIM1	135.7 pg/mL	KDIGO	ED ad	hos-7d
	60	102	162	sFGF23	322.1 pg/mL	KDIGO	ED ad	hos-7d
Udzik 2022[5]	41	87	128	sIL8	14.67 pg/mL	KDIGO	postop-6h	postop-7d
	43	89	132	uNGALuCr	11.32 ng/mg	KDIGO	postop-6h	postop-7d
Yu 2022[6]	19	89	108	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	postop-24h	postop-2d
Hu 2022[7]	33	77	110	uNGAL	170 ng/mL	KDIGO	ICU ad	ICU-3d
Lima 2022[8]	21	36	57	sPENK	119 pmol/L	KDIGO	postop-48h	postop-7d
Akalya 2022[9]	21	28	49	u[TIMP2][IGFBP7]	0.01 (ng/mL)2/1000	KDIGO	postCT-24h	postCT-3d
Waskowski 2021[10]	31	62	93	u[TIMP2][IGFBP7]	0.43 (ng/ml)2/1000	KDIGO	postop-24h	postop-7d
Lee 2021[11]	59	85	144	uLFABP	101.77 ng/dL	KDIGO	postop-18h	postop-7d
	59	85	144	uLFABPuCr	0.61 ng/mg	KDIGO	postop-18h	postop-7d
Szymanowicz 2021[12]	18	96	114	sCysC	1.23mg/L	KDIGO	postop-12h	postop-7d
	18	96	114	sNGAL	140 ng/ml	KDIGO	postop-3h	postop-7d
Zhen 2021[13]	23	172	195	sNGAL	135 ng/ml	AKIN	CCU ad	CCU st
Qiu 2021[14]	44	46	90	uNGAL	181.71 ng/mL	KDIGO	ICU ad	ICU-7d
Vogel 2021[15]	13	67	80	uNAGuCr	1590 ng/g	KDIGO	ED ad	hos st
	14	68	82	uKIM1uCr	7.2 U/g	KDIGO	ED ad	hos st
Qian 2019[16]	33	58	91	uKlotho	0.86 ng/umol	AKIN	postop	postop-7d
	33	58	91	uNGAL	4.49 ng/umol	AKIN	postop-2h	postop-7d

Study	Dis	NDis	Total	Index	cutoff	Ref	Tsample	Tevent
Khawaja 2019[17]	24	22	46	sNGAL	150 ng/ml	RIFLE	ICU-24h	ICU st
Ferrari 2019[18]	188	254	442	u[TIMP2][IGFBP7]	0.3 (ng/ml)2/1000	KDIGO	ICU ad	ICU-7d
Xie 2019[19]	239	480	719	u[TIMP2][IGFBP7]	0.3 (ng/ml)2/1000	KDIGO	ICU ad	ICU-7d
Khreba 2019[20]	27	18	45	uKIM1uCr	1.9ng/ml	KDIGO	postop-3h	postop-7d
Mosa 2018[21]	65	117	182	sNGAL	75 ng/ml	KDIGO	postop-2h	postop-7d
Introcaso 2018[22]	24	45	69	sNGAL	154ng/ml	KDIGO	postop	postop-7d
Oezkur 2017[23]	35	115	150	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	postop	postop-2d
WangY 2017[24]	20	37	57	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	ICU-4h	ICU-7d
Finge 2017[25]	34	59	93	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	postop-3h	postop-2d
Cuartero 2017[26]	49	49	98	u[TIMP2][IGFBP7]	0.4 (ng/mL)2/1000	AKIN	ICU ad	NR
Mayer 2017[27]	9	101	110	u[TIMP2][IGFBP7]	0.4 (ng/mL)2/1000	KDIGO	postop	NR
Wybraniec 2017[28]	9	86	95	uLFABPuCr	0.46 ng/mg	AKIN	postop-6h	hos st
	9	86	95	uIL18uCr	89.8 pg/mg	AKIN	postop-6h	hos st
	9	86	95	uKIM1uCr	0.43 ng/mg	AKIN	postop-6h	hos st
van Wolfswinkel 2016[29]	6	33	39	uNGAL	308 ng/ml	KDIGO	hos ad	hos-7d
	6	33	39	uKIM1	1.83 ng/ml	KDIGO	hos ad	hos-7d
	6	33	39	sNGAL	168 ng/ml	KDIGO	hos ad	hos-7d
	6	33	39	uNGALuCr	5.1 ng/mmol	KDIGO	hos ad	hos-7d
	6	33	39	uKIM1uCr	0.085 ng/mmol	KDIGO	hos ad	hos-7d
Dusse 2016[30]	8	32	40	u[TIMP2][IGFBP7]	1.03 (ng/mL)2/1000	KDIGO	postop-24h	postop-2d
Gunnerson 2016[31]	35	340	375	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	ICU ad	ICU-0d
Yang 2016[32]	49	54	103	sCysC	2.7 mg/l	KDIGO	ICU ad	ICU-7d
	49	54	103	uNGAL	42.54 ng/ml	KDIGO	ICU ad	ICU-7d
	49	54	103	uKIM1	1.62 ng/ml	KDIGO	ICU ad	ICU-7d
	49	54	103	uNGALuCr	125.36 ng/mg	KDIGO	ICU ad	ICU-7d
	49	54	103	uKIM1uCr	3.28 ng/mg	KDIGO	ICU ad	ICU-7d
Prowle 2015[33]	25	68	93	uNGAL	195 ng/mL	RIFLE	postop	postop-5d
	25	68	93	uNGALuCr	2346 ng/mg	RIFLE	postop	postop-5d
	25	68	93	uLFABP	9.5 ng/mL	RIFLE	postop	postop-5d

Study	Dis	NDis	Total	Index	cutoff	Ref	Tsample	Tevent
	25	68	93	sCysC	1.24 mg/L	RIFLE	postop	postop-5d
Gaipov 2015[34]	20	40	60	sNGAL	175.4 ng/ml	KDIGO	postop-2h	postop-1d
	20	40	60	uNGAL	27.1 ng/ml	KDIGO	postop-2h	postop-1d
	20	40	60	sUA	5.45 ng/ml	KDIGO	postop-2h	postop-1d
Padhy 2014[35]	30	30	60	sNGAL	89.5 ng/ml	AKIN	post-con 24h	postop-3d
	30	30	60	sCysC	017 mg/l	AKIN	post-con 4h	postop-3d
Gunnerson 2016[31]	35	340	375	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	postop	postop-2d
Wetz 2015[36]	16	26	42	u[TIMP2][IGFBP7]	1.1 (ng/mL)2/1000	KDIGO	postop-24h	postop-2d
Pilarczyk 2015[37]	6	54	60	u[TIMP2][IGFBP7]	0.89 (ng/mL)2/1000	KDIGO	postop-24h	postop-2d
Nisula 2015[38]	497	942	1439	uIL18	65 pg/ml	KDIGO	ICU-24h	ICU-7d
Chang 2015[39]	74	73	147	uNGAL	39.0 ng/mL	KDIGO	ICU ad	ICU-7d
Tekce 2015[40]	8	14	22	uKIM1	1412 pg/ mL	AKIN	postCT-24h	postCT-72h
	8	14	22	uKIM1uCr	0.83 ng/mg	AKIN	postCT-24h	postCT-72h
Zeng 2014[41]	37	160	197	uNGALuCr	86 ug/g	AKIN	postop-12h	postop-2d
	37	160	197	uLFABPuCr	2630 ug/g	AKIN	postop-4h	postop-2d
Ghonemy 2014[42]	17	33	50	sNGAL	62 ng/dL	RIFLE	postop-6h	hos st
	17	33	50	sCysC	2.65 ng/dL	RIFLE	postop-6h	hos st
Padhy 2014[35]	30	30	60	sNGAL	155.2 ng/ml	AKIN	post-con 4h	postop-3d
Meersch 2014[43]	26	24	50	u[TIMP2][IGFBP7]	0.5 (ng/mL)2/1000	KDIGO	postop-24h-max	postop-7d
Hoste 2014[44]	61	92	153	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	ICU ad	ICU-2d
Thanakitcharu 2014[45]	46	84	130	uNGAL	11.3 ng/ml	AKIN	postop-3h	postop-2d
Nisula 2014[46]	379	633	1012	uNGAL	157 ng/ml	KDIGO	ICU ad	ICU-3d
Matsa 2014[47]	59	135	194	uNGAL	400 ng/ml	RIFLE	ICU ad	ICU-3d
	59	135	194	sNGAL	350 ng/ml	RIFLE	ICU ad	ICU-4d
Ueta 2014[48]	6	36	42	uNGAL	17.7 ng/mL	AKIN	postop	postop-6h
	6	36	42	uNGALuCr	65.1 ug/g	AKIN	postop	postop-6h
	6	36	42	sNGAL	267.8 ng/mL	AKIN	postop	postop-6h
	6	36	42	uLFABP	25.1 ng/mL	AKIN	postop	postop-6h
	6	36	42	uLFABPuCr	36.7 ug/g	AKIN	postop	postop-6h
Hjortrup 2015[49(p201)]	122	100	222	sNGAL	558 ng/ml	KDIGO	ICU ad	ICU st

Study	Dis	NDis	Total	Index	cutoff	Ref	Tsample	Tevent
	122	100	222	uNGAL	582 ng/ml	KDIGO	ICU ad	ICU st
Torregrosa 2015[50(p201)]	20	124	144	uNGALuCr	35 ng/mg	RIFLE	postop-12h	postop-7d
	20	124	144	uKIM1uCr	2.11 ng/mg	RIFLE	postop-12h	postop-7d
	20	124	144	uLFABPuCr	17.86 ng/mg	RIFLE	postop-12h	postop-7d
	15	34	49	uNGALuCr	41.7 ng/mg	RIFLE	postop-12h	postop-7d
	15	34	49	uKIM1uCr	1.73 ng/mg	RIFLE	postop-12h	postop-7d
	15	34	49	uLFABPuCr	20.7 ng/mg	RIFLE	postop-12h	postop-7d
Aydoğdu 2013[51]	68	88	156	uNGAL	29.5 ng/mL	RIFLE	ICU 24h	ICU-7d
	68	88	156	uCysC	0.11 mg/L	RIFLE	ICU 24h	ICU-7d
	68	88	156	sCysC	1.5 mg/L	RIFLE	ICU 24h	ICU-7d
Camou 2013[52]	43	7	50	sNGAL	337 ng/ml	AKIN & RIFLE	ICU ad	ICU-2d
de Geus 2013[53]	115	427	542	sNGAL	266 ng/ml	AKIN	ICU ad	ICU-2d
Valette 2013[54]	30	68	98	sNGAL	113 ng/ml	AKIN	post-con 24h	postcon-3d
Breidthardt 2012[55]	60	147	207	sNGAL	94 ng/ml	AKIN	hos ad	hos-4d
Katagiri 2012[56]	28	47	75	uLFABP	51.6 ng/mL	AKIN	postop-12h	postop-6d
	28	47	75	uNAG	7.5 IU/L	AKIN	postop-12h	postop-10d
Li 2012[57]	11	14	25	uNGALuCr	17.19 ng/mg	AKIN	postop-6h	postop-5d
	11	14	25	uLFABPuCr	3451.75 ng/mg	AKIN	postop-4h	postop-5d
Matsui 2012[58]	48	37	85	uLFABPuCr	6.96 ug/g	AKIN	preop	postop-2d
Nickolas 2012[59]	96	1539	1635	uNGAL	104 ng/ml	RIFLE	ED ad	hos-3d
	96	1539	1635	uKIM1	2.817 ng/ml	RIFLE	ED ad	hos-3d
	96	1539	1635	uIL18	0.065 ng/ml	RIFLE	ED ad	hos-3d
	96	1539	1635	uLFABP	12.9 ng/ml	RIFLE	ED ad	hos-3d
	96	1539	1635	uCysC	171 ng/ml	RIFLE	ED ad	hos-3d
Chen 2012[60]	43	107	150	sNGAL	110 ng/ml	AKIN	postop	postop-2d
	43	107	150	uNGAL	33 ng/ml	AKIN	postop	postop-2d
	43	107	150	sIL18	374 pg/ml	AKIN	postop	postop-2d
	43	107	150	uIL18	70 pg/ml	AKIN	postop	postop-2d
	43	107	150	sCysC	1.8 mg/l	AKIN	postop	postop-2d
	17	133	150	uCysC	0.2 mg/l	AKIN	postop	postop-2d

Study	Dis	NDis	Total	Index	cutoff	Ref	Tsample	Tevent
Wagener 2011[61(p201)]	37	55	92	uNGALuCr	0.74 ng/mg	RIFLE	postop-3h	hos st
Hanson 2011[62]	84	79	163	uNGAL	510ng/ml	AKIN	hos ad	NR
Matsui 2011[63]	14	11	25	uLFABPuCr	44.1 ug/g	AKIN	ICU ad	ICU st
	14	11	25	uPCXuCr	151.7 ug/g	AKIN	ICU ad	ICU st
	14	11	25	uAlbuCr	64.2 mg/g	AKIN	ICU ad	ICU st
	14	11	25	uNAGuCr	23.7 IU/g	AKIN	ICU ad	ICU st
Parikh 2011[64]	60	1159	1219	uIL18	60 pg/mL	AKIN & RIFLE	postop-6h	hos st
	60	1159	1219	uNGAL	102 ng/mL	AKIN & RIFLE	postop-6h	hos st
	60	1159	1219	sNGAL	293 ng/mL	AKIN & RIFLE	postop-6h	hos st
Constantin 2010[65]	52	36	88	sNGAL	155 ng/mL	RIFLE	ICU ad	ICU st
Cruz 2010[66]	133	168	301	sNGAL	150 ng/mL	RIFLE	ICU ad	ICU st
Perry 2010[67]	75	879	954	sNGAL	353.5 ng/mL	AKIN	postop	postop-4d
Shapiro 2010[68]	24	637	661	sNGAL	150 ng/mL	RIFLE	ED ad	hos-7d
Makris 2009[69]	11	20	31	uNGAL	25 ng/mL	RIFLE	ICU ad	ICU st
Haase-Fielitz 2009[70]	15	58	73	sNGAL	150 ng/mL	RIFLE	postop-6h	postop-5d
	15	58	73	sCysC	1.1 mg/L	RIFLE	postop-6h	postop-5d
	15	58	73	BUN	4.5 mmol/L	RIFLE	postop-6h	postop-5d
Han 2009[71]	36	54	90	uKIM1uCr	1.2 ng/mg	AKIN	postop	postop-3d
	36	54	90	uNAGuCr	18.5 U/g	AKIN	postop-3h	postop-3d
	36	54	90	uNGALuCr	456.0 ng/mg	AKIN	postop-3h	postop-3d
Liangos 2009[72]	13	90	103	uKIM1uCr	0.42ng/mg	AKIN	postop	postop-3d
	13	90	103	uNAGuCr	66 mU/mg	AKIN	postop	postop-3d
	13	90	103	uNGALuCr	166ng/mg	AKIN	postop	postop-3d
	13	90	103	uIL18uCr	92pg/mg	AKIN	postop	postop-3d
	13	90	103	uCysCuCr	192ng/mg	AKIN	postop	postop-3d
Haase-Fielitz 2009[73]	50	50	100	sNGAL	150 ng/mL	RIFLE	postop-6h	hos st
	50	50	100	sCysC	1.1 mg/L	RIFLE	postop-6h	hos st
	50	50	100	BUN	4.5 mmol/L	RIFLE	postop-6h	hos st
Nickolas 2008[74]	30	605	635	uNGALuCr	85 ug/g	RIFLE	hos ad	hos-3d

Study	Dis	NDis	Total	Index	cutoff	Ref	Tsample	Tevent
	30	605	635	uNAGuCr	1 U/g	RIFLE	hos ad	hos-3d
	30	605	635	uCr	124 umol/L	RIFLE	hos ad	hos-3d
Parikh 2005[75]	52	86	138	uIL18	25 pg/mL	AKIN	ICU ad	ICU-2d
Liu 2015[76]	19	16	35	sKlotho	119.145 U/L	AKIN	postop	postop-2d
	19	16	35	sCysC	1.38 mg/L	AKIN	postop-72h	postop-2d
Mossanen 2017[77]	21	86	107	sPENK	93.2 pmol/L	KDIGO	preop	postop-4d
	21	86	107	suPAR	2.45 ng/mL	KDIGO	preop	postop-4d
Hollinger 2018[78]	360	222	582	sPENK	84.2 pmol/L	KDIGO	ICU-48h	ICU-7d
Zhao 2022[79]	31	91	122	sPENK	57 pmol/L	KDIGO	hos ad	hos-7d
	31	91	122	sNGAL	56.5 ng/mL	KDIGO	hos ad	hos-7d
Safadi 2024[80]	62	306	368	uNGAL	23.4 or 65 ng/mL	KDIGO	hos ad	hos-3d
	62	306	368	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	hos ad	hos-3d
Xie 2024[81]	134	423	557	u[TIMP2][IGFBP7]	0.265 (ng/mL)2/1000	KDIGO	postop-12h	postop-7d
Bihorac 2014[82]	71	337	408	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	ICU ad	ICU-0.5d
Kashani 2013[83]	101	627	728	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	ICU ad	ICU-0.5d
Zaouter 2018[84]	37	13	50	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	postop-12h	postop-7d
Adler 2018[85]	31	17	48	u[TIMP2][IGFBP7]	0.24 (ng/mL)2/1000	KDIGO	hos ad	postop-7d
Sakyi 2021[86]	44	107	151	u[TIMP2][IGFBP7]	0.3 (ng/mL)2/1000	KDIGO	hos ad-24h	ICU-7d
	44	107	151	uNGAL	39.2 ng/mL	KDIGO	hos ad-24h	ICU-7d
Irqsusi 2022[87(p202)]	14	36	50	u[TIMP2][IGFBP7]	0.07 (ng/mL)2/1000	KDIGO	postop	postop-3d
Yang 2022[88]	59	470	529	u[TIMP2][IGFBP7]	0.7 (ng/mL)2/1000	KDIGO	hos ad	hos-7d
Berlin 2023[89]	54	99	153	sCysC	1540.6 ng/mL	KDIGO	ED ad	hos-7d
	54	99	153	sKIM1	131.15 pg/mL	KDIGO	ED ad	hos-7d
	54	99	153	sNGAL	440.7 ng/mL	KDIGO	ED ad	hos-7d

Abbreviation: AKI, acute kidney injury; Dis, number of patients with AKI; Ndis, number of patients without AKI; Ref, reference; Tsample, the timepoint of collecting sample; Tevent, the follow up time of AKI; KDIGO, Kidney Disease: Improving Global Outcomes; AKIN, Acute Kidney Injury Network; RIFLE, Risk, Injury, Failure, Loss, and End-stage renal disease; ED, emergency department; ICU, intensive care unit; CCU, cardiac care unit; hos, hospital; ad, admission; st, stay; preop, preoperative; postop, postoperative; NR, not reported; NGAL, Neutrophil Gelatinase-associated Lipocalin; CysC, cystatin C; TIMP2, Tissue Inhibitor of Metalloproteinases 2; Insulin-like Growth Factor Binding Protein 7; LFABP, Liver-Type Fatty Acid-Binding Protein; Cr, creatinine; KIM1, kidney injury molecule-1; IL-18, interleukin-18; PENK, Proenkephalin; b, blood; u, urine; d, day, h, hour.

Table S 6 Assay providers of included studies.

Study	Index	Assay Provider
Ergun 2023	sNGAL	BT LAB test kit (Bioassay Technology Laboratory, China)
Shakked 2022	sCysC	Siemens N Latex Cystatin C assay (REF: OQNM19)
Shakked 2022	sNGAL	The NGAL Test (BioPorto Diagnostics A/S, Hellerup, Denmark)
Ergun 2022	sNGAL	BT LAB test kit (Bioassay Technology Laboratory, China)
Pilarczyk 2022	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical, San Diego, CA, USA)
Pilarczyk' 2022	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical, San Diego, CA, USA)
Okuda 2022	uLFABPuCr	RENAPRO (CMIC Pharmaceutical Services Co., Ltd., Tokyo, Japan)
Pei 2022	sCysC	Sigma (RAB0105)
Pei 2022	sNGAL	Abcam (ab113326)
Pei 2022	sKIM1	R&D Systems (DSKM100)
Pei 2022	sFGF23	R&D Systems (DY2604-05)
Udzik 2022	sIL8	Luminex xMAP technology (Luminex Corporation, Austin, TX, USA)
Udzik 2022	uNGALuCr	Luminex xMAP technology (Luminex Corporation, Austin, TX, USA)
Yu 2022	u[TIMP2][IGFBP7]	NephroCheck (bioMerieux Inc, Durham, NC, USA)
Hu 2022	uNGAL	NORMAN-2 scatter turbidimetry analyzer (Nanjing Norman Biotechnology Co., Ltd),
Lima 2022	sPENK	Sphingotest® penKid® immunoassay kit (PEK96)
Akalya 2022	u[TIMP2][IGFBP7]	Human Quantikine TIMP2 (R&D Systems, USA) and Human IGFBP7 kits (Cloud Clone Corporation, USA)
Waskowski 2021	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical, San Diego, CA, USA)
Lee 2021	uLFABP	Norudia human L-FABP assay kit, Ibaraki, Japan
Lee 2021	uLFABPuCr	Norudia human L-FABP assay kit, Ibaraki, Japan
Szymanowicz 2021	sCysC	Siemens BN II/BN Pro Spec systems
Szymanowicz 2021	sNGAL	Triage Meter NGAL Test, Biosite, Alere Health, San Diego, CA, USA
Zhen 2021	sNGAL	Biolegend, USA; R&D Systems, USA
Qiu 2021	uNGAL	Legend MaxTM ELISA kit (BioLegend)
Vogel 2021	uNAGuCr	ELISA Duo kit and the respective ancillary reagent kit (R&D Systems, Minneapolis, Minnesota, USA)
Vogel 2021	uKIM1uCr	modified ELISA-assay in 96-well plates (Roche, Basel, Swiss)
Qian 2019	uKlotho	Klotho ELISA kits (Immuno-Biological Laboratories Co, Tokyo, Japan)
Qian 2019	uNGAL	NGAL ELISA kits (R&D Systems, Inc., Minneapolis, MN, USA)
Khawaja 2019	sNGAL	Triage® Meter Proby Alere Diagnostics point of care analyzer, CA, US

Study	Index	Assay Provider
Ferrari 2019	u[TIMP2][IGFBP7]	NephroCheck® Test
Xie 2019	u[TIMP2][IGFBP7]	NephroCheck® Test
Khreba 2019	uKIM1uCr	KIM-1 ELISA kit supplied by Sun Red {Shangahi, China}
Mosa 2018	sNGAL	ELISA kits from Elabscience Ltd., Wuhan, China
Introcaso 2018	sNGAL	Triage Meter NGAL Test, Biosite, Alere Health, San Diego, USA
Oezkur 2017	u[TIMP2][IGFBP7]	Nephrocheck® (Astute Medical, San Diego, CA, USA)
WangY 2017	u[TIMP2][IGFBP7]	NephroCheck Test and Astute140 Meter (Astute Medical, San Diego, CA)
WangY 2017'	u[TIMP2][IGFBP7]	NephroCheck Test and Astute144 Meter (Astute Medical, San Diego, CA)
Finge 2017	u[TIMP2][IGFBP7]	NephroCheck test (Astute Medical, San Diego, CA)
Cuartero 2017	u[TIMP2][IGFBP7]	Nephrocheck®, Astute Medical
Mayer 2017	u[TIMP2][IGFBP7]	NephroCheckTM Test, Astute Medical, San Diego, CA
Wybraniec 2017	uLFABPuCr	ELISA kit by EKF diagnostics, Cardiff, United Kingdom
Wybraniec 2017	uIL18uCr	ELISA kit by EKF diagnostics, Cardiff, United Kingdom
Wybraniec 2017	uKIM1uCr	eBioscience, San Diego, CA
van Wolfswinkel 2016	uNGAL	ELISA kits (NGAL Quantikine and KIM-1 Quantikine kits from R&D Systems, Inc, Minneapolis, USA)
van Wolfswinkel 2016	uKIM1	ELISA kits (NGAL Quantikine and KIM-1 Quantikine kits from R&D Systems, Inc, Minneapolis, USA)
van Wolfswinkel 2016	sNGAL	ELISA kits (NGAL Quantikine and KIM-1 Quantikine kits from R&D Systems, Inc, Minneapolis, USA)
van Wolfswinkel 2016	uNGALuCr	ELISA kits (NGAL Quantikine and KIM-1 Quantikine kits from R&D Systems, Inc, Minneapolis, USA)
van Wolfswinkel 2016	uKIM1uCr	ELISA kits (NGAL Quantikine and KIM-1 Quantikine kits from R&D Systems, Inc, Minneapolis, USA)
Dusse 2016	u[TIMP2][IGFBP7]	NephroCheck Test (Astute Medical, San Diego, CA, USA)
Gunnerson 2016	u[TIMP2][IGFBP7]	NephroCheck Test and Astute140 Meter; Astute Medical Inc., San Diego, CA
Yang 2016	sCysC	DLCN20, DKM100 and DSCTC0; R&D Systems, Minneapolis, MN, USA
Yang 2016	uNGAL	DLCN20, DKM100 and DSCTC0; R&D Systems, Minneapolis, MN, USA
Yang 2016	uKIM1	DLCN20, DKM100 and DSCTC0; R&D Systems, Minneapolis, MN, USA
Yang 2016	uNGALuCr	DLCN20, DKM100 and DSCTC0; R&D Systems, Minneapolis, MN, USA

Study	Index	Assay Provider
Yang 2016	uKIM1uCr	DLCN20, DKM100 and DSCTC0; R&D Systems, Minneapolis, MN, USA
Prowle 2015	uNGAL	ELISA described in reference
Prowle 2015	uNGALuCr	ELISA described in reference
Prowle 2015	uLFABP	ELISA described in reference
Prowle 2015	sCysC	nephelometric technology on a Beckman Image Analyzer (Beckman Coulter, Brea, CA)
Gaipov 2015	sNGAL	Bio Vendor NGAL Elisa kit; Cat no: RD191102200R, BioVendor Research and Diagnostic Products, Brno, Czech Republic
Gaipov 2015	uNGAL	Bio Vendor NGAL Elisa kit; Cat no: RD191102200R, BioVendor Research and Diagnostic Products, Brno, Czech Republic
Gaipov 2015	sUA	Synchron LX20 system (Beckman Coulter, Brea, CA)
Padhy 2014	sNGAL	ELISA kit method (Biovendor) adapted to ELISA reader instrument (Bio-Rad)
Padhy 2014	sCysC	ELISA kit method (Biovendor) adapted to ELISA reader instrument (Bio-Rad)
Gunnerson 2016	u[TIMP2][IGFBP7]	NephroCheck Test and Astute140 Meter; Astute Medical Inc., San Diego, CA
Wetz 2015	u[TIMP2][IGFBP7]	NephroCheck test, Astute140 Meter; Astute Medical, San Diego, CA, USA
Pilarczyk 2015	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical, San Diego, CA, USA)
Nisula 2015	uIL18	Cusabio Biotechw Wuhan, China ELISA kit
Chang 2015	uNGAL	R&D Systems, DLCN20, McKinley Place NE Minneapolis
Tekce 2015	uKIM1	Cusabio, Wuhan, China
Tekce 2015	uKIM1uCr	Cusabio, Wuhan, China
Zeng 2014	uNGALuCr	R&D System, Minneapolis, MN, USA
Zeng 2014	uLFABPuCr	Hycult Biotech, Uden, The Netherlands
Ghonemy 2014	sNGAL	Biovendor NGAL
Ghonemy 2014	sCysC	Biovendor CysC
Padhy 2014	sNGAL	Biovendor NGAL
Meersch 2014	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical, San Diego, CA, USA).
Hoste 2014	u[TIMP2][IGFBP7]	NephroCheck® Test (Astute Medical, San Diego, CA, USA)
Thanakitcharu 2014	uNGAL	ARCHITECT NGAL assay (Abbott Diagnostics, USA)
Nisula 2014	uNGAL	NGAL ELISA Rapid Kit (BioPorto® Gentofte, Denmark)
Matsa 2014	uNGAL	BioportoTM Diagnostics turbidimetric assay
Matsa 2014	sNGAL	BioportoTM Diagnostics turbidimetric assay

Study	Index	Assay Provider
Ueta 2014	uNGAL	CLIA; ARCHITECT®, Abbott Diagnostics, Abott Park, IL, USA
Ueta 2014	uNGALuCr	CLIA; ARCHITECT®, Abbott Diagnostics, Abott Park, IL, USA
Ueta 2014	sNGAL	CLIA; ARCHITECT®, Abbott Diagnostics, Abott Park, IL, USA
Ueta 2014	uLFABP	CLIA; ARCHITECT®, Abbott Diagnostics, Abott Park, IL, USA
Ueta 2014	uLFABPuCr	CLIA; ARCHITECT®, Abbott Diagnostics, Abott Park, IL, USA
Hjortrup 2014	sNGAL	NGAL Test (BioPorto Diagnostics A/S, Gentofte, Denmark)
Hjortrup 2014	uNGAL	NGAL Test (BioPorto Diagnostics A/S, Gentofte, Denmark)
Torregrosa 2014	uNGALuCr	Human NGAL ELISA from Hycult Biotech
Torregrosa 2014	uKIM1uCr	Human TIM-1/KIM-1/HAVCR from R&D Systems Europe Ltd. UK
Torregrosa 2014	uLFABPuCr	Human L-FABP HK404 ELISA from Hycult Biotech
Torregrosa 2014	uNGALuCr	Human NGAL ELISA from Hycult Biotech
Torregrosa 2014	uKIM1uCr	Human TIM-1/KIM-1/HAVCR from R&D Systems Europe Ltd. UK
Torregrosa 2014	uLFABPuCr	Human L-FABP HK404 ELISA from Hycult Biotech
Aydoğdu 2013	uNGAL	Human Lipocalin-2/NGAL ELISA BiovendorTM
Aydoğdu 2013	uCysC	BNII nephelometer (Dade Behring GmbH, Marburg, Germany)
Aydoğdu 2013	sCysC	BNII nephelometer (Dade Behring GmbH, Marburg, Germany)
Camou 2013	sNGAL	TRIAGE Meter ProTM (AlereTM Incorporated, San Diego CA, E´ tatsUnis)
de Geus 2013	sNGAL	Triage® immunoassay
Valette 2013	sNGAL	Triage NGAL test, Biosite, San Diego, CA
Breidthardt 2012	sNGAL	Triage ® NGAL; Alere San Diego Incorporated; San Diego, CA, USA
Katagiri 2012	uLFABP	Human L-FABP Assay Kit; CMIC Co. Ltd, Tokyo, Japan
Katagiri 2012	uNAG	Hitachi 917; Boehringer Mannheim Biochemica, Indianapolis, IN
Li 2012	uNGALuCr	h-NGAL ELISA kit (R&D Systems, Inc. Minneapolis, MN)
Li 2012	uLFABPuCr	h-L-FABP ELISA kit (HyCult Biotechnology BV, Uden, the Netherlands)
Matsui 2012	uLFABPuCr	Human L-FABP ELISA kit (CMIC, Tokyo, Japan)
Nickolas 2012	uNGAL	ARCHITECT platform (Abbott Laboratories, Abbott Park, Illinois)
Nickolas 2012	uKIM1	ARCHITECT platform (Abbott Laboratories, Abbott Park, Illinois)
Nickolas 2012	uIL18	ARCHITECT platform (Abbott Laboratories, Abbott Park, Illinois)
Nickolas 2012	uLFABP	ARCHITECT platform (Abbott Laboratories, Abbott Park, Illinois)
Nickolas 2012	uCysC	ARCHITECT platform (Abbott Laboratories, Abbott Park, Illinois)

Study	Index	Assay Provider
Chen 2012	sNGAL	ELISA (R&D Systems, Minneapolis, MN, USA)
Chen 2012	uNGAL	ELISA (R&D Systems, Minneapolis, MN, USA)
Chen 2012	sIL18	ELISA (Medical and Biologic Laboratories, Nagoya, Japan)
Chen 2012	uIL18	ELISA (Medical and Biologic Laboratories, Nagoya, Japan)
Chen 2012	sCysC	ELISA (R&D Systems, Minneapolis, MN, USA)
Chen 2012	uCysC	ELISA (R&D Systems, Minneapolis, MN, USA)
Wanger 2011	uNGALuCr	ELISA (Antibodyshop, Gentofte, Denmark)
Hanson 2011	uNGAL	NGAL ELISA (R&D Systems, Abingdon, UK)
Matsui 2011	uLFABPuCr	HUMAN L-FABP ELISA kit (CMIC Co., Ltd., Tokyo, Japan)
Matsui 2011	uPCXuCr	ELISA (Denca Co., Ltd., Tokyo, Japan)
Parikh 2011	uIL18	ARCHITECT assay (Abbott Diagnostics, Abbott Park, IL)
Parikh 2011	uNGAL	ARCHITECT assay (Abbott Diagnostics, Abbott Park, IL)
Parikh 2011	sNGAL	ARCHITECT assay (Abbott Diagnostics, Abbott Park, IL)
Constantin 2010	sNGAL	Triage Meter (Boisite, San Diego, CA)
Cruz 2010	sNGAL	Triage NGAL Test (Biosite Inc, San Diego, CA)
Perry 2010	sNGAL	Triage Meter (Biosite, San Diego, CA)
Shapiro 2010	sNGAL	(Biosite Incorporated, San Diego, CA)
Markris 2009	uNGAL	wGAL Rapid ELISA Kit Cat. No. KIT 037 from Antibodyshop (now Bioporto), Gentofte, Denmark
Haase-Fielitz 2009	sNGAL	Triage Meter (Biosite, CA)
Haase-Fielitz 2009	sCysC	Beckman Image Analyzer (Beckman Coulter, Brea, CA)&DakoCytomation (DAKO, Botany, New South Wales, Australia)
Haase-Fielitz 2009	BUN	Beckman Synchron LX 20 (Beckman Coulter, Fullerton, CA)
Han 2009	uKIM1uCr	modified ELISA system using polyclonal KIM-1 antibodies as described previously
Han 2009	uNAGuCr	Roche Applied Science, Indianapolis, IN
Han 2009	uNGALuCr	ELISA kit (Antibody Shop, Gentofte, Denmark)
Liangos 2009	uKIM1uCr	ELISA (Han et al., 2002)
Liangos 2009	uNAGuCr	colorimetric assay (Boehringer Mannheim, Germany) (Liangos et al., 2007)
Liangos 2009	uNGALuCr	human Lipocalin-2/NGAL immunoassay (Quantikine®, R & D systems, Minneapolis, MN)
Liangos 2009	uIL18uCr	sandwich ELISA (MBL, Naka-ku Nagoya, Japan)
Liangos 2009	uCysCuCr	Behring Nephelometer II System (Dade Behring, Deerfield, IL)

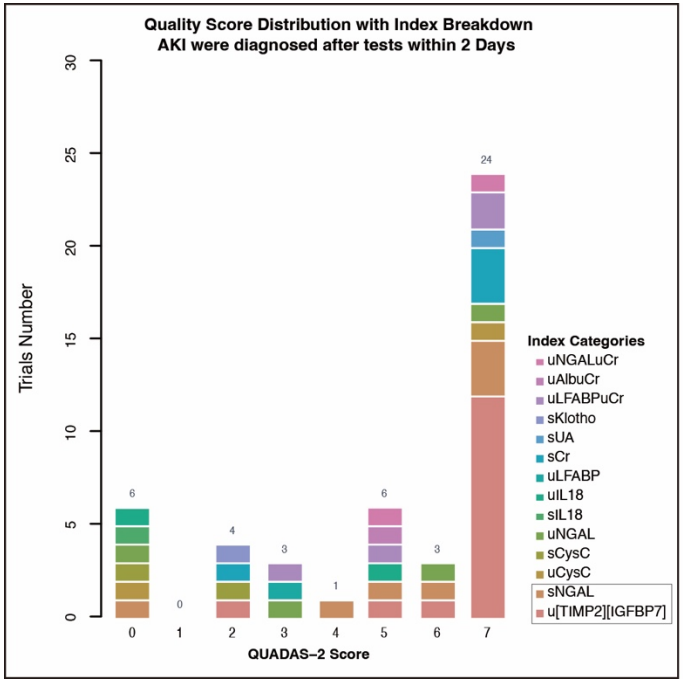
Study	Index	Assay Provider
Haase-Fielitz 2009'	sNGAL	Triage Meter (Biosite, CA)
Haase-Fielitz 2009'	sCysC	Beckman Image Analyzer (Beckman Coulter, Brea, CA)&DakoCytomation (DAKO, Botany, New South Wales, Australia)
Haase-Fielitz 2009'	BUN	Beckman Synchron LX 20 (Beckman Coulter, Fullerton, CA)
Nickolas 2008	uNGALuCr	immunoblots
Nickolas 2008	uNAGuCr	NAG kit (Roche Diagnostics, Mannheim, Germany)
Nickolas 2008	uCr	QuantiChrom Creatinine Assay Kit (BioAssay Systems, Hayward, California)
Parikh 2005	uIL18	human IL-18 ELISA kit(R & D Systems, Minneapolis, MN)
Liu 2015	sKlotho	ELISA Kit
Liu 2015	sCysC	in the department of clinical laboratory, using standard assays
Mossanen 2017	sPENK	immunoluminometric assay (Sphingotec GmbH, Hennigsdorf, Germany)
Mossanen 2017	suPAR	suPARnostic enzyme linked immunoassay (ELISA) (ViroGates, Birkerød, Denmark)
Hollinger 2018	sPENK	chemiluminescence immunoassay (Sphingotec GmbH, Hennigsdorf, Germany)
Zhao 2022	sPENK	ELISA kits (Elisa Biotech; Shanghai, China)
Zhao 2022	sNGAL	ELISA kits (Elisa Biotech; Shanghai, China)
Safadi 2024	uNGAL	Roche COBAS c511 using reagents from BioPorto, Hellerup, Denmark
Safadi 2024	u[TIMP2][IGFBP7]	NephroCheck® Test System (Astute Medical Inc., San Diego, CA)
Safadi 2024'	u[TIMP2][IGFBP7]	NephroCheck® Test System (Astute Medical Inc., San Diego, CA)
Safadi 2024'	uNGAL	Roche COBAS c511 using reagents from BioPorto, Hellerup, Denmark
Xie 2024	u[TIMP2][IGFBP7]	NephroCheck® (Astute Medical, San Diego, CA, USA)
Xie 2024'	u[TIMP2][IGFBP7]	NephroCheck® (Astute Medical, San Diego, CA, USA)
Bihorac 2014	u[TIMP2][IGFBP7]	NEPHROCHECK® Test and ASTUTE140® Meter, Astute Medical Inc, San Diego, CA
Kashani 2014	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical, San Diego, CA, USA)
Zaouter 2018	u[TIMP2][IGFBP7]	NephroCheck1 Test (Astute Medical, San Diego, CA, USA)
Adler 2018	u[TIMP2][IGFBP7]	NephroCheckTM point-of-care test (Astute Medical Inc., San Diego, CA, USA)
Sakyi 2021	u[TIMP2][IGFBP7]	ELISA kit(Mindray MR-96A; Shenzhen Mindray Bio-medical electronics Co., Ltd, China)
Sakyi 2021	uNGAL	ELISA kit(Mindray MR-96A; Shenzhen Mindray Bio-medical electronics Co., Ltd, China)
Irqsusi 2021	u[TIMP2][IGFBP7]	NephroCheckTM Test (Astute Medical)
Yang 2022	u[TIMP2][IGFBP7]	VITROS NephroCheck immunoassay on a VITROS 3600 immunodiagnostic system (Ortho Clinical Diagnostics)

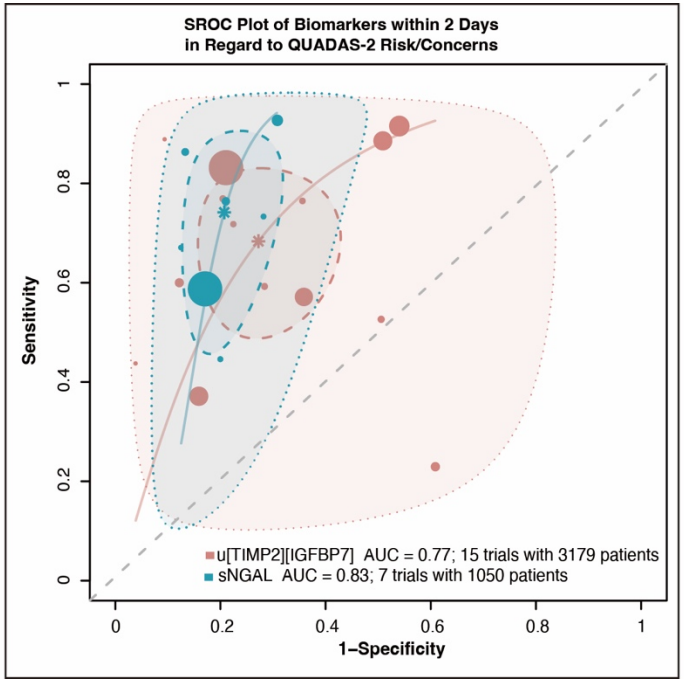
Study	Index	Assay Provider
Berlin 2023	sCysC	R-PLEX Assay kits (K151YWR-2, K1514UR-2, K1515ER-2) from Meso Scale Discovery (MSD, Rockville, MD)
Berlin 2023	sKIM1	R-PLEX Assay kits (K151YWR-2, K1514UR-2, K1515ER-2) from Meso Scale Discovery (MSD, Rockville, MD)
Berlin 2023	sNGAL	R-PLEX Assay kits (K151YWR-2, K1514UR-2, K1515ER-2) from Meso Scale Discovery (MSD, Rockville, MD)

Abbreviation: AKI, acute kidney injury; NGAL, Neutrophil Gelatinase-associated Lipocalin; CysC, cystatin C; TIMP2, Tissue Inhibitor of Metalloproteinases 2; Insulin-like Growth Factor Binding Protein 7; LFABP, Liver-Type Fatty Acid-Binding Protein; Cr, creatinine; KIM1, kidney injury molecule-1; IL-18, interleukin-18; PENK, Proenkephalin; b, blood; u, urine; d, day, h, hour.

Results of Meta-Analysis

Diagnostic efficacy of biomarkers on AKI with reliable evidence base.





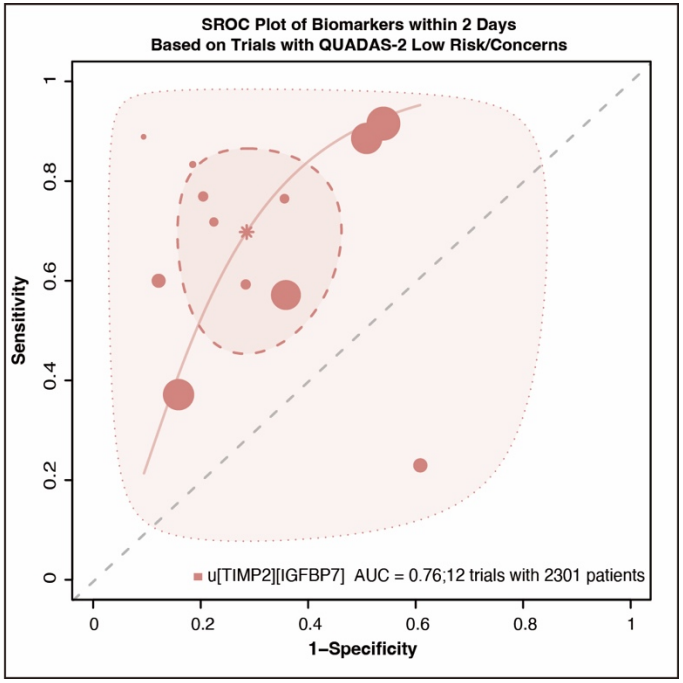


Figure S 4 Diagnostic efficacy of biomarkers on AKI with reliable evidece base.

Diagnostic efficacy of all biomarkers on AKI without considering the reliability of evidence base.

Meta-analysis results based on data of all scenarios.

Table S 7 Meta-analysis results based on data of all scenarios.

Biomarkers	Trials	Sample Size	Sensitivity	Specificity	SROC AUC	DOR	PLR	NLR
sCr	20	15836	66.71%[59.49%, 73.67%]	79.92%[75.16%, 84.50%]	81.18%[72.93%, 88.10%]	7.98	3.32	0.42
sCysC	16	4183	72.73%[68.32%, 77.30%]	78.45%[72.91%, 83.50%]	73.21%[61.09%, 80.75%]	9.71	3.37	0.35
sNGAL	40	8435	72.22%[67.64%, 76.69%]	77.94%[74.46%, 81.31%]	82.09%[76.51%, 86.84%]	9.19	3.27	0.36
sPENK	5	1035	72.62%[62.54%, 82.35%]	80.50%[73.40%, 86.68%]	84.28%[67.25%, 90.82%]	10.95	3.72	0.34
u[TIMP2][IGFBP7]	29	6461	69.10%[62.29%, 75.62%]	69.09%[63.63%, 74.37%]	74.59%[65.66%, 81.52%]	5.00	2.24	0.45
uCysC	4	2042	68.37%[40.17%, 90.39%]	76.83%[69.66%, 82.60%]	79.22%[63.25%, 83.23%]	7.17	2.95	0.41
uCysCuCr	3	835	54.39%[24.60%, 81.00%]	82.25%[76.81%, 87.26%]	82.47%[69.27%, 90.32%]	5.53	3.07	0.55
uKIM1	4	1799	71.73%[54.65%, 88.63%]	71.88%[52.06%, 88.69%]	79.03%[48.37%, 93.30%]	6.49	2.55	0.39
uKIM1uCr	12	1504	67.00%[57.16%, 77.04%]	76.79%[69.12%, 83.59%]	78.69%[64.91%, 89.11%]	6.72	2.89	0.43
uLFABP	6	2134	67.24%[56.23%, 78.40%]	72.99%[62.94%, 81.71%]	76.44%[59.12%, 88.85%]	5.55	2.49	0.45
uLFABPuCr	12	1140	74.31%[68.47%, 79.62%]	75.92%[69.06%, 82.07%]	79.47%[69.34%, 80.40%]	9.12	3.09	0.34
uNAGuCr	6	1137	77.21%[51.27%, 93.71%]	75.24%[49.20%, 92.66%]	85.04%[41.28%, 98.53%]	10.30	3.12	0.30
uNGAL	28	7445	76.19%[71.36%, 80.87%]	76.66%[72.32%, 80.80%]	83.28%[76.97%, 88.49%]	10.51	3.26	0.31
uNGALuCr	17	2641	74.46%[68.16%, 80.47%]	80.54%[70.26%, 88.57%]	74.79%[69.59%, 90.34%]	12.06	3.83	0.32
uIL18uCr	4	930	56.23%[37.01%, 76.23%]	83.38%[67.63%, 93.71%]	74.49%[42.55%, 80.14%]	6.44	3.38	0.52
uIL18	5	4581	50.38%[38.94%, 62.76%]	78.23%[73.10%, 82.53%]	75.59%[64.00%, 84.30%]	3.65	2.31	0.63

Abbreviation: SROC AUC, Summary Receiver Operating Characteristic Area Under the Curve; DOR, Diagnostic Odds Ratio; PLR, Positive Likelihood Ratio; NLR, Negative Likelihood Ratio; sNGAL, soluble Neutrophil Gelatinase-associated Lipocalin; sCr, serum Creatinine; u[TIMP2][IGFBP7], urine [Tissue Inhibitor of Metalloproteinases 2][Insulin-like Growth Factor Binding Protein 7]; uNGALur, urine NGAL to urine Creatinine ratio; sPENK, serum Proenkephalin; uNAGuCr, urine N-Acetyl-β-D-Glucosaminidase to urine Creatinine ratio.

Meta-analysis results based on cardiac surgery associated acute kidney injury.

Table S 8 Meta-analysis results based on cardiac surgery associated acute kidney injury.

Biomarkers	TRIAL	SAMPLE SIZE	SENScombined	SPECcombined	SROCcombined	DOR	PLR	NLR
uCysC	2	251	75.30%[15.28%, 99.45%]	78.47%[64.11%, 88.66%]	82.06%[47.15%, 17.01%]	11.11	3.50	0.31
sCr	8	655	71.33%[55.62%, 84.45%]	75.64%[67.65%, 82.68%]	77.66%[65.30%, 28.68%]	7.73	2.93	0.38
u[TIMP2][IGFBP7]	19	2604	63.87%[54.85%, 72.95%]	72.77%[66.37%, 78.71%]	74.88%[62.76%, 83.48%]	4.73	2.35	0.50
uNGALuCr	8	778	73.28%[66.66%, 79.46%]	72.26%[50.67%, 88.52%]	72.45%[65.10%, 68.84%]	7.14	2.64	0.37
uLFABP	4	354	71.17%[57.60%, 84.08%]	70.47%[52.79%, 84.96%]	77.42%[53.43%, 93.06%]	5.89	2.41	0.41
uLFABPuCr	7	678	73.20%[65.72%, 79.57%]	74.73%[63.03%, 84.26%]	77.28%[65.11%, 82.38%]	8.08	2.90	0.36
sCysC	7	615	76.85%[68.98%, 84.47%]	82.57%[74.21%, 89.22%]	83.81%[70.32%, 80.56%]	15.72	4.41	0.28
sNGAL	13	3171	74.62%[64.64%, 83.38%]	76.50%[72.28%, 80.27%]	80.35%[73.17%, 81.86%]	9.57	3.18	0.33
uNGAL	8	1888	74.82%[64.51%, 84.48%]	76.54%[66.97%, 84.66%]	82.77%[67.53%, 92.32%]	9.70	3.19	0.33
uKIM1uCr	5	382	66.47%[50.49%, 82.73%]	75.63%[64.24%, 86.03%]	78.53%[55.09%, 92.74%]	6.15	2.73	0.44
uIL18uCr	2	198	67.55%[40.76%, 87.45%]	76.69%[43.84%, 94.99%]	79.20%[70.00%, 96.29%]	6.85	2.90	0.42

Abbreviation: SROC AUC, Summary Receiver Operating Characteristic Area Under the Curve; DOR, Diagnostic Odds Ratio; PLR, Positive Likelihood Ratio; NLR, Negative Likelihood Ratio; sNGAL, soluble Neutrophil Gelatinase-associated Lipocalin; sCr, serum Creatinine; u[TIMP2][IGFBP7], urine [Tissue Inhibitor of Metalloproteinases 2][Insulin-like Growth Factor Binding Protein 7]; uNGALur, urine NGAL to urine Creatinine ratio; sPENK, serum Proenkephalin; uNAGuCr, urine N-Acetyl-β-D-Glucosaminidase to urine Creatinine ratio.

Meta-analysis results based on sepsis associated acute kidney injury.

Table S 9 Meta-analysis results based on sepsis associated acute kidney injury.

Biomarkers	TRIAL	Sample Size	SENScombined	SPECcombined	SROCcombined	DOR	PLR	NLR
sCr	2	272	56.37%[41.28%, 70.30%]	78.16%[41.74%, 96.28%]	58.39%[35.54%, 79.66%]	4.62	0.90	2.58
sNGAL	4	1040	68.90%[42.16%, 89.89%]	74.09%[53.57%, 89.89%]	79.52%[39.55%, 96.71%]	6.33	0.03	2.66
uNGAL	3	285	77.30%[66.79%, 85.92%]	73.15%[63.09%, 81.50%]	82.33%[66.28%, 88.32%]	9.28	0.00	2.88
sPENK	2	749	69.43%[56.09%, 79.76%]	82.18%[71.99%, 89.55%]	83.04%[0.00%, 87.36%]	10.48	0.44	3.90

Abbreviation: SROC AUC, Summary Receiver Operating Characteristic Area Under the Curve; DOR, Diagnostic Odds Ratio; PLR, Positive Likelihood Ratio; NLR, Negative Likelihood Ratio; sNGAL, soluble Neutrophil Gelatinase-associated Lipocalin; sCr, serum Creatinine; uNGAL, urine Neutrophil Gelatinase-associated Lipocalin. sPENK, serum Proenkephalin.

PART II STARDaki

Expert Panel

Zhiyong Peng
(To be confirmed…)

Delphi Questionnaire Template

STARD 2015 Project Number and Theme	Core content that needs to be adjusted for AKI	Expert Rating (1-5)	Modification suggestion (example)
1. Title/Summary	It is necessary to clearly indicate whether the study involves joint evaluation of "stress-type" biomarkers (such as NGAL, TIMP-2 · IGFBP7) and "functional" markers (such as creatinine)	☐1 ☐2 ☐3 ☐4 ☐5	Add biomarker type identification in the title
3. Study population	Base line renal function (eGFR, base line creatinine) and acquisition method must be reported Clearly define the etiological stratification of AKI (prerenal/renal/postrenal). Explain whether chronic kidney disease (CKD) patients are excluded	☐1 ☐2 ☐3 ☐4 ☐5	Add base line data reporting specification
4. Recruitment methods	It should be explained whether stratified recruitment is based on KDIGO criteria (such as only including Stage 2-3 patients).	☐1 ☐2 ☐3 ☐4 ☐5	Clear clinical staging basis for inclusion in exclusion criteria
7. Reference standards	If using the KDIGO standard, the specific method for determining creatinine/urine output needs to be explained (standardized laboratory testing). If using new biomarkers as reference standards, it is necessary to evaluate whether it causes circular reasoning (such as composite standards in ADQI consensus).	☐1 ☐2 ☐3 ☐4 ☐5	Add reference standard verification statement
8. Detection methods	Biomarker testing needs to indicate the testing platform (research-based ELISA vs clinical certification kit). Report sampling time window (relative to the time of AKI triggering event)	☐1 ☐2 ☐3 ☐4 ☐5	Supplementary technical verification attachment requirements
9. Threshold definition	Clinical evidence of biomarker cut-off values (such as based on AKI staging or prognosis) is required. • If dynamic thresholds (e.g. adjusted based on base line creatinine) are used, the calculation method should be explained	☐1 ☐2 ☐3 ☐4 ☐5	Increase threshold calibration method description
10. Executor qualifications	It is necessary to indicate whether the biomarker tester has received AKI-related training (such as NACCL certification).	☐1 ☐2 ☐3 ☐4 ☐5	Clarify laboratory quality control requirements

12. Statistical methods	Sensitivity/specificity stratification results for different stages of AKI must be reported If subgroup analysis is involved (such as postoperative AKI vs septic AKI), separate data should be presented	☐1 ☐2 ☐3 ☐4 ☐5	Mandatory tiered reporting
13. Repetitive assessment	Intra/inter-batch coefficient of variation (CV%) for biomarker detection should be included, especially for urine markers (affected by urine concentration).	☐1 ☐2 ☐3 ☐4 ☐5	Supplementary stability verification data
15. Study population characteristics	Liquid management status (capacity overload/insufficient) must be reported. It is necessary to include a history of exposure to nephrotoxic drugs (such as contrast agents and aminoglycosides).	☐1 ☐2 ☐3 ☐4 ☐5	Expand the list of clinical background variables
16. Handling missing data	The interpolation method for creatinine fluctuation data needs to be explained (such as using the CKD-EPI formula to backtrack estimate the base line value).	☐1 ☐2 ☐3 ☐4 ☐5	Standardize creatinine data processing flow
17. Time interval	The relationship between biomarker sampling time and the following nodes must be marked: - AKI triggering event (e.g. time of surgery/sepsis) - KDIGO standard judgment time	☐1 ☐2 ☐3 ☐4 ☐5	Add timeline diagram requirement
20. Adverse events	Sampling-related complications may need to be reported	☐1 ☐2 ☐3 ☐4 ☐5	Improve intrusive operation risk disclosure
23. Subgroup analysis	Diagnostic efficacy comparison of different AKI etiological subgroups must be included (such as cardiorenal syndrome vs acute tubular necrosis).	☐1 ☐2 ☐3 ☐4 ☐5	Forced etiological stratification analysis
25. Clinical applicability	It is necessary to discuss the incremental value of biomarker detection in specific scenarios (such as ICU rapid triage vs outpatient long-term monitoring).	☐1 ☐2 ☐3 ☐4 ☐5	Increasing Health Economics Assessment

Explanation:

1. Scoring criteria
   a) 1 = No AKI adaptation required at all; 2 = Minor modification required; 3 = Moderate modification required; 4 = Significant modification required; 5 = Mandatory

modification required

b) Consensus threshold: average score ⩾ 4 and 80% expert score ⩾ 4

2. Dispute resolution mechanism

a) Initiate structured discussions on items with score dispersion (SD ⩾ 1.5)

b) Supporting evidence: QUADAS-2 evaluation results, STARD 2015 compliance data, ADQI consensus document