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Sepsis

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September 2026

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1. **Activity and Outcomes of a Multidisciplinary Sepsis Unit: Fifty Thousand Consultations over Thirteen Years.**

Authors: BorgesSa M.;MartinMartinez E.;Aranda M.;Socias A.;Tejada S.;del Castillo A.;Garau M.;Perez de Amezaga L.;Mena J. and Giglio, A.

Publication Date: 2026

Journal: Antibiotics 15(8) (pagination), pp. Article Number: 737. Date of Publication: 01 Aug 2026

Abstract: Background. Sepsis is a leading, time-dependent cause of in-hospital death, and guidelines now prioritize organized care such as code-sepsis protocols. Yet little is known about the long-term activity, organization and outcomes of permanent, hospital-scale programs. We characterized the activity of a hospital-wide multidisciplinary sepsis unit (MSU) over thirteen years and evaluated mortality trends. Methods. Retrospective cohort study using the registry of a hospital-wide MSU (2011-2023). The analysis unit was the sepsis event. Activity, referral pathways, interventions, follow-up and mortality were analyzed; temporal trends used multivariable logistic regression and standardized mortality ratios (SMR). Results. The unit attended 10,874 patients across 15,723 events and 50,925 consultations (median age 67; 59.3% men), referred mainly through the sepsis code (45.0%) and, increasingly, proactive early-warning detection (15.2%). An antibiotic change was recommended in 57.2% of events, and 89.8% of all suggested changes were implemented. Follow-up was sustained (median 3 visits; 61.8%). In-hospital mortality was 7.6%, and 11.8% in protocol-confirmed sepsis.

Crude mortality did not fall, but severity rose (organ dysfunctions 1.67 to 2.72; septic shock 8 to 13%; both p Copyright © 2026 by the authors

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2. **Risk Factors for Sepsis in Abdominal Surgery: A Clinical Experience.**

Authors: CastilloCueva J.S.;I/iguezPlascencia J.D.;CastroQuishpe Z.K.;Quintero B. and MorilloPuente, S.

Publication Date: 2026

Journal: Anti-Infective Agents 24(5) (pagination), pp. Article Number: E22113525375556. Date of Publication: 2026

Abstract: Introduction: Postoperative sepsis is a severe complication with increasing incidence in recent decades. However, data on its prevalence and risk factors in abdominal surgery remain limited. Aim(s): This study aimed to investigate the clinical and microbiological characteristics of sepsis in patients undergoing abdominal surgery, focusing on risk factor identification to enhance prevention strategies and optimize empirical treatment. Objective(s): The objective of this study was to identify the associated factors and microbiology of sepsis in patients who underwent abdominal surgery between 2019 and 2021 at a hospital in Loja, Ecuador. Material(s) and Method(s): A retrospective case series analysis was conducted on 1, 502 adult patients. Chi-square/FisherAos exact test and odds ratios were applied for inferential analysis. Results and Discussion: Sepsis occurred in 5.8% of patients and was significantly associated with age a*65 years, comorbidities, emergency procedures, contaminated/dirty surgeries, laparoscopic approach, ICU admission, and mortality. Lower sepsis rates were observed in patients with gallbladder/biliary tract pathology and appendicitis/peritonitis. Escherichia coli and Klebsiella pneumoniae were the predominant isolates in clinical samples and rectal swabs, frequently exhibiting multidrug resistance and beta-lactamase production. Conclusion(s): Sepsis in abdominal surgery is linked to multiple clinical and surgical factors, particularly multidrug-resistant bacteria. These findings emphasize the need for early risk stratification, perioperative infection control, and antimicrobial stewardship programs to tailor empirical treatment. The high prevalence of resistant bacteria highlights the urgency of reinforcing microbiological surveillance and optimizing antibiotic prophylaxis. Implementing these strategies in clinical practice could improve patient outcomes and reduce the economic burden of sepsis management.Copyright 2026, Bentham Science Publishers

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3. **Sepsis, atrial fibrillation and mortality risk: an updated systematic review and meta-analysis of >3 million patients.**

Authors: Cormaci, Vito Maria Daniele;Menichelli, Danilo;Malatesta, Daniele;Del Sole, Francesco;Gazzaniga, Gianluca;Pignatelli, Pasquale;Galardo, Gioacchino;Pugliese, Francesco and Pastori, Daniele

Publication Date: Aug ,2026

Journal: Journal of Infection 93(2), pp. 106818

Abstract: OBJECTIVES: To evaluate the new-onset atrial fibrillation (NOAF) prevalence and the overall, in-hospital, post-discharge mortality, and ischemic stroke risk associated with NOAF in septic patients. METHODS: Systematic review and meta-analysis of studies reporting the prevalence and risk of NOAF in patients with sepsis (PROSPERO CRD420261284949). MEDLINE and EMBASE were searched from inception to 31st December 2025. Within eligible studies, mortality and stroke risk were analyzed. Random-effects models were used to calculate pooled effects estimated with Odds Ratio (OR) and 95% confidence intervals (95%CI). Risk of bias was assessed by ROBINS-I tool. RESULTS: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was

13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, p: 15 including 3,323,792 patients were analyzed. The NOAF prevalence was 13.27% (95%CI 8.16-19.4, pCONCLUSIONS: NOAF is a frequent cardiac complication of septic patients and is associated with increased mortality and stroke risk. Copyright © 2026 The Author(s). Published by Elsevier Ltd.. All rights reserved

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4. **Prognostic value and clinical net benefit of global longitudinal strain in sepsis: a prospective study with internal bootstrap validation.**

Authors: Dai X.;Li S.;Ge H.;Zhang C.;Hu C.;Xiong H. and Wei, H.

Publication Date: 2026

Journal: Frontiers in Cardiovascular Medicine 13(pagination), pp. Article Number: 1835581. Date of Publication: 01 Jun 2026

Abstract: Objective - Conventional left ventricular ejection fraction (LVEF) often fails to detect early sepsis-induced myocardial dysfunction (SIMD). This study aimed to evaluate the prognostic utility of speckle-tracking echocardiography (STE)-derived global longitudinal strain (GLS) and to develop an internally validated clinical nomogram with demonstrated net benefit for predicting 28-day mortality in sepsis patients. Methods - This prospective observational study enrolled 46 patients presenting with sepsis or septic shock at the Emergency Department of The First Affiliated Hospital of Sun Yat-sen University (February-June 2023). STE-derived average GLS (GLS_AVG), conventional echocardiography, and cardiac biomarkers were evaluated within 24 h of diagnosis. Prognostic performance was assessed using restricted multivariable logistic regression, Receiver Operating Characteristic (ROC) curves, and DeLong's test. A predictive nomogram was constructed, validated via 1, 000 bootstrap resamples, and evaluated for clinical utility using Decision Curve Analysis (DCA). Results - The 28-day mortality rate was 23.9% (11/46). Compared to survivors, non-survivors exhibited significantly impaired GLS_AVG (-10.09 +/- 4.18% vs. -14.69 +/- 3.13%, P -11.0% (sensitivity 72.7%, specificity 82.9%). In restricted multivariable analysis, GLS_AVG showed a borderline independent association with 28-day mortality in the restricted multivariable model (OR: 1.266; 95% CI: 0.995-1.676; P = 0.067). The formulated GLS-SOFA nomogram showed excellent calibration upon 1, 000-bootstrap internal validation. Crucially, DCA confirmed that integrating GLS yielded a substantially higher clinical net benefit across a wide range of threshold probabilities compared to relying on LVEF alone. Conclusion - STE-derived GLS is a highly sensitive, relatively load-independent marker of early myocardial dysfunction in sepsis, significantly outperforming LVEF in predicting 28-day mortality. The validated GLS-SOFA nomogram and decision curve models provide a practical, high-yield tool to enhance risk stratification and guide early personalized hemodynamic resuscitation in emergency settings.Copyright © 2026 Dai, Li, Ge, Zhang, Hu, Xiong and Wei.

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5. **Association of Body Mass Index with 28-Day Mortality in Adult Intensive Care Patients with Sepsis: A Retrospective Observational Study.**

Authors: Dilken, Olcay;Altinay, Mustafa;Bostan, Batuhan;Yakar, Mehmet Nuri;Duran, Betul;Duran, Feyzullah Orkut;Soyalp, Sevde Sumeyye Iraz;Ipekoglu, Merve;Cayir, Ziya Eren and Cinar, Ayse Surhan

Publication Date: 2026

Journal: Sisli Etfal Hastanesi Tp Bulteni 60(2), pp. 172–179

Abstract: Objectives: The effect of obesity on sepsis outcomes remains controversial. Several studies have described an "obesity paradox," whereby a higher body mass index (BMI) correlates with improved survival in critically ill patients. This study aimed to investigate the relationship between BMI and 28-day mortality in adult patients with sepsis admitted to the intensive care unit (ICU). Methods:

We conducted a retrospective observational study including 83 adult patients diagnosed with sepsis according to the Sepsis-3 criteria who were admitted to the ICUs of Sisli Hamidiye Etfal Training and Research Hospital between June 2023 and June 2025. BMI was reported using World Health Organization categories and analyzed using three BMI groups based on the final cohort distribution. The primary endpoint was 28-day mortality. Multivariable logistic regression analysis was conducted with adjustment for age, sex, Sequential Organ Failure Assessment score, creatinine, and C-reactive protein. Results: The median age was 75 years (interquartile range, 66-82), and 55% of the patients were male. Survivors had a higher BMI than non-survivors (27.3 vs. 24.9 kg/m2; p=0.004) and higher albumin levels (p=0.024). BMI was inversely associated with 28-day mortality in the multivariable analysis (odds ratio, 0.74 per 1 kg/m2; 95% confidence interval, 0.58-0.91; p=0.008). Conclusion: Higher BMI was associated with lower 28-day mortality in septic ICU patients. Further prospective studies are needed to validate this relationship and explore the underlying potential mechanisms. © Copyright 2026 by The Medical Bulletin of Sisli Etfal Hospital

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6. **The Geriatric Nutritional Risk Index and its association with all-cause mortality in cancer patients with sepsis: a dual-center retrospective cohort study.**

Authors: He, Yili;Zhang, Jie;Yuan, Xiaojin;Li, Yang;Jiang, Wenyan and Huang, Ling

Publication Date: 2026

Journal: Frontiers in Nutrition 13, pp. 1795795

Abstract: Background: The Geriatric Nutritional Risk Index (GNRI) is a validated nutritional assessment tool predictive of outcomes in elderly patients, yet its prognostic value in adult cancer patients with sepsis remains unexplored. Methods: This retrospective cohort study included adult cancer patients with sepsis from two sources: 523 patients from Guangxi Medical University Cancer Hospital ICU (2013-2024) and 4,447 patients from the MIMIC-IV database (2008-2019). Cox multivariable regression was used to analyze the association between GNRI and 28-day/60-day all-cause mortality during ICU stay. Restricted cubic splines (RCS), proportional hazards (PH) assumption testing, and landmark analyses were performed to assess linearity and temporal stability. Predictive performance was evaluated using area under the receiver operating characteristic (AUROC) curve, calibration curves with bootstrap resampling, decision curve analysis (DCA), integrated discrimination improvement (IDI), and net reclassification improvement (NRI). Internal cross-validation was conducted to validate model stability and correct for overfitting. Results: In Cox multivariable regression analysis, GNRI levels were independently associated with reduced mortality in both cohorts. Restricted cubic spline (RCS) curves demonstrated a linear dose-response relationship between GNRI and mortality. PH testing and landmark analysis confirmed the time-independent prognostic value of GNRI. Subgroup analyses confirmed the robustness of these findings. The model achieved excellent discriminative ability (AUC 0.906 in the Guangxi cohort and 0.810 in the MIMIC-IV cohort for 28-day mortality). Calibration curves showed excellent agreement between predicted and observed probabilities. DCA confirmed favorable net clinical benefit across a wide range of risk thresholds. IDI and NRI verified that GNRI significantly improved risk classification. Internal cross-validation showed stable optimism-corrected C-indices with minimal overfitting. Conclusion: Among adult patients with cancer and sepsis, a lower GNRI is associated with increased short- and medium-term all-cause mortality. GNRI showed excellent discriminative ability, good calibration, favorable clinical net benefit, significant improvement in risk classification, and robust stability in internal validation, with consistent performance in external validation. GNRI may serve as a simple, reliable prognostic tool for risk stratification and early nutritional intervention in this high-risk population. Copyright © 2026 He, Zhang, Yuan, Li, Jiang and Huang.

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7. **Factors associated with mortality in older sepsis patients: a nationwide retrospective cohort study in Germany.**

Authors: Heimrich, Konstantin G.;Prell, Tino;Rose, Norman;Schonenberg, Aline;Pletz, Mathias W.;Ruhnke, Thomas and Fleischmann-Struzek, Carolin

Publication Date: Jul 02 ,2026

Journal: Age & Ageing 55(7)

Abstract: BACKGROUND: Sepsis is a leading cause of mortality in older adults, but large unselected cohort data on factors associated with mortality remain limited. OBJECTIVE: To examine patient characteristics and acute illness features associated with mortality among older patients hospitalised with sepsis in Germany. METHODS: We conducted a retrospective, observational cohort study using statutory health insurance data (AOK) of patients aged >=70 years and hospitalised with sepsis between 2016 and 2019. Outcomes were in-hospital and 90-day post-discharge mortality. Multivariate blockwise logistic regression models were applied to examine associations across conceptual domains. RESULTS: Of 227 110 older sepsis patients [median age, 81 years (IQR 76-85); 49.2% women], in-hospital mortality was 35.2%. Organ dysfunction, particularly hepatic and renal dysfunction, as well as receipt of organ support including mechanical ventilation and dialysis, showed strong associations with in-hospital mortality. Among 147 080 patients discharged alive, 19.5% died within 90 days. In this post-discharge phase, care dependency and metastatic cancer showed stronger associations with mortality, whereas associations with acute illness features were lower. Female sex was independently associated with lower mortality and conferred a survival advantage after discharge. CONCLUSION: The high mortality rate of older sepsis patients is associated with both baseline patient vulnerability and acute illness severity. Care dependency, used as a proxy for functional vulnerability overlapping with frailty, showed a strong association with mortality, particularly after discharge. These findings highlight the importance of integrating preexisting patient vulnerability and acute illness characteristics to guide individualised acute and post-discharge care for older sepsis patients. Copyright © The Author(s) 2026. Published by Oxford University Press on behalf of the British Geriatrics Society.

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8. **Comparative Diagnostic Performance of qSOFA, NEWS2, MEWS, and SOFA Scores in Predicting In-Hospital Mortality Among Patients with Suspected Sepsis in Emergency Care: A systematic review and meta analysis.**

Authors: Jagdishchandra S.;Vashi T. and Parshuram, T. R.

Publication Date: 2026

Journal: International Journal of Life Sciences Biotechnology and Pharma Research 15(7), pp. 485–495

Abstract: Background: Sepsis is a major cause of in-hospital mortality and requires early identification of patients at risk of clinical deterioration. Several bedside scoring systems, including qSOFA, NEWS2, MEWS, and SOFA, are used for mortality risk stratification in emergency-care settings; however, their comparative prognostic performance remains uncertain. Objective(s): To systematically review and compare the performance of qSOFA, NEWS2, MEWS, and SOFA scores for predicting in-hospital mortality among adult patients with suspected sepsis presenting to emergency care. Method(s): This systematic review and meta-analysis included original studies published between January 2020 and 2026. PubMed/MEDLINE, Scopus, Web of Science, Embase, the Cochrane Library, and Google Scholar were searched using terms related to sepsis, emergency care, qSOFA, NEWS2, MEWS, SOFA, and mortality. Eligible studies included adult emergency-care patients with suspected infection or sepsis and reported mortality-prediction measures such as sensitivity, specificity, likelihood ratios, diagnostic odds ratios, or area under the receiver operating characteristic curve. Study selection and data extraction were performed independently by two reviewers. Risk of bias was assessed using QUADAS-2, and compatible data were planned for pooling using random-effects models. Result(s): The included studies showed considerable variation in patient populations, score thresholds, timing of assessment, sepsis definitions, and mortality endpoints. NEWS2 generally demonstrated higher sensitivity and appeared most useful for early identification of patients at risk of death. qSOFA showed lower sensitivity but comparatively higher specificity, identifying patients with more advanced physiological deterioration. MEWS demonstrated moderate and inconsistent predictive performance. SOFA provided strong prognostic assessment because of its detailed evaluation of organ dysfunction, although its dependence on laboratory and treatment-related variables limited its immediate application

during emergency triage. Conclusion(s): NEWS2 appears to be the most suitable score for early mortality screening, while qSOFA may be more useful for identifying patients with severe illness. SOFA offers comprehensive prognostic assessment but is less practical at initial triage, whereas MEWS shows variable performance. These scores should complement rather than replace clinical judgment.Copyright ©2026 Int.

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9. **Admission lactate and in-hospital mortality in elderly patients with sepsis receiving invasive mechanical ventilation: a multicenter retrospective cohort study.**

Authors: Jing S.;Jiang L.;Liu A.;Liang J.;Sun X. and Lin, Y.

Publication Date: 2026

Journal: European Journal of Medical Research 31(1) (pagination), pp. Article Number: 1009. Date of Publication: 01 Dec 2026

Abstract: Background: Elderly patients with sepsis requiring invasive mechanical ventilation are at high risk of death. However, the prognostic value of admission lactate in this specific population remains incompletely characterized. Method(s): This multicenter retrospective cohort study used the eICU Collaborative Research Database, a de-identified United States intensive care unit database, and included 2,981 patients aged >= 65 years with sepsis who received invasive mechanical ventilation. The exposure was the first lactate measured within 24 h after intensive care unit admission, and the primary outcome was in-hospital mortality during the index hospitalization. Multivariable logistic regression was performed after adjustment for 12 predefined covariates: age, sex, body mass index, APACHE IV score, Glasgow Coma Scale, creatinine, albumin, hemoglobin, diabetes, chronic obstructive pulmonary disease, congestive heart failure, and hypertension. Generalized additive modeling assessed non-linearity, exploratory two-piecewise logistic regression evaluated a possible threshold effect, and receiver operating characteristic analysis assessed discrimination. Result(s): Overall in-hospital mortality was 38.0%. Mortality increased across lactate tertiles, from 27.8% in the low-lactate group (0.2-1.7 mmol/L) to 35.5% in the medium-lactate group (> 1.7-3.4 mmol/L) and 50.8% in the high-lactate group (> 3.4-27.1 mmol/L) (p Result(s): Overall in-hospital mortality was 38.0%. Mortality increased across lactate tertiles, from 27.8% in the low-lactate group (0.2-1.7 mmol/L) to 35.5% in the medium-lactate group (> 1.7-3.4 mmol/L) and 50.8% in the high-lactate group (> 3.4-27.1 mmol/L) (p Result(s): Overall in-hospital mortality was 38.0%. Mortality increased across lactate tertiles, from 27.8% in the low-lactate group (0.2-1.7 mmol/L) to 35.5% in the medium-lactate group (> 1.7-3.4 mmol/L) and 50.8% in the high-lactate group (> 3.4-27.1 mmol/L) (p Result(s): Overall in-hospital mortality was 38.0%. Mortality increased across lactate tertiles, from 27.8% in the low-lactate group (0.2-1.7 mmol/L) to 35.5% in the medium-lactate group (> 1.7-3.4 mmol/L) and 50.8% in the high-lactate group (> 3.4-27.1 mmol/L) (p Conclusion(s): Higher admission lactate was independently associated with greater in-hospital mortality in elderly septic patients receiving invasive mechanical ventilation. The association appeared non-linear, but the identified threshold was exploratory and requires external prospective validation.Copyright © The Author(s) 2026.

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10. **Sepsis-Associated Acute Kidney Injury and 28-Day Mortality in Critically Ill Patients with Sepsis: A Retrospective Cohort Study.**

Authors: Kilic, Isa and Yildiz, Abdulmecit

Publication Date: Aug 09 ,2026

Journal: Journal of Clinical Medicine 15(16)

Abstract: Background/Objectives: We aimed to analyse the development of acute kidney injury (AKI), its association with mortality, and mortality-associated factors in patients admitted to the intensive care unit (ICU) with sepsis. Methods: This retrospective cohort study was conducted on adult patients with sepsis admitted to the ICU of a tertiary-care hospital between January 2023 and December 2023. Demographic, clinical, and laboratory data within the first 24 h of admission to the ICU were recorded.

These data were compared between patients with and without sepsis-associated acute kidney injury (SA-AKI). Results: Among 1163 admissions, 185 met the study criteria, and the incidence of SA-AKI was 45.4%. The overall 28-day mortality was 38.4%. Patients with SA-AKI had significantly higher mortality than those without SA-AKI (63.1% vs. 17.8%, p p = 0.001). Among patients with SA-AKI, elevated lactate showed a borderline association with mortality (HR = 1.06 per mmol/L, 95% CI 1.00-1.13, p = 0.053); first-day vasopressor use was not independently associated with mortality after adjustment for illness severity. Conclusions: SA-AKI was independently associated with higher 28-day mortality. Within the SA-AKI subgroup, lactate showed only a borderline association with mortality, whereas first-day vasopressor use appeared to reflect illness severity

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11. **Clinicians' decision-making about broad-spectrum antibiotic prescribing for suspected maternal sepsis during childbirth in the UK: a qualitative study.**

Authors: Kingdon, Carol;Greenfield, Benjamin;Cunningham, Caroline;Freeman, David;Ming, Damien;Lissauer, David;Holmes, Alison and Merriel, Abi

Publication Date: Jul 17 ,2026

Journal: BMJ Open 16(7), pp. e110559

Abstract: OBJECTIVE: Sepsis management and antimicrobial resistance (AMR) are linked priorities. Early identification and treatment of sepsis with broad-spectrum antibiotics are key to reducing morbidity and mortality. We aimed to investigate clinicians' decision-making about broad-spectrum antibiotics for suspected maternal sepsis in women admitted to hospital for childbirth, to identify if, how and why overtreatment may occur. DESIGN: Qualitative study. Semistructured interviews were conducted online, transcribed verbatim, coded in MAXQDA and analysed using the thematic Framework Approach. SETTING: National Health Service (NHS) in England, Scotland and Wales, March-June 2024. PARTICIPANTS: 24 clinicians, purposively sampled for representation from relevant professions with roles in decision-making (n=15 obstetricians; n=4 anaesthetists; n=3 midwives; n=2 microbiologists). RESULTS: Participants report increasing numbers of women in labour are being prescribed broad-spectrum antibiotics for suspected maternal sepsis per guidelines. Fear of missing sepsis, absence of evidence about sepsis during labour and beliefs about antibiotic use informed clinicians' views, impacting workloads and women's experiences. 9/24 participants said overtreatment is a problem; 21/24 believed overtreatment occurs. Clinicians' beliefs, views and experiences are reported in three themes that provide a framework to explain how clinicians navigate guidelines including; why overtreatment can occur (Theme 1: The sepsis guideline is more than a guideline); how decisions to prescribe broad-spectrum antibiotics during labour are made (Theme 2: Trying to balance the whole picture) and where clinicians' think the bigger picture problems lie (Theme 3: If we continue down this path where might we be). The framework encapsulates clinicians' tacit knowledge governing decision-making and guideline use. CONCLUSIONS: Clinicians link priorities for sepsis management and AMR, but antimicrobial stewardship comes second to concerns about missing sepsis in high-stakes maternity care. Overtreatment may be inevitable until better evidence to support decision-making for suspected maternal sepsis and point-of-care diagnostic tests for women in labour exist and are embedded in clinical guidelines and clinicians' mindlines. Copyright © Author(s) (or their employer(s)) 2026. Re-use permitted under CC BY. Published by BMJ Group

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12. **Prediction models for mortality in patients with sepsis: a systematic review and meta-analysis.**

Authors: Lei S.;Ruan H.;Wang J.;Zhao G.;Zhao H.;Liu J. and Li, J.

Publication Date: 2026

Journal: Frontiers in Medicine 13(pagination), pp. Article Number: 1730156. Date of Publication: 01 Ar 2026

Abstract: Background - Sepsis remains a leading cause of mortality among critically ill patients

worldwide. Although an increasing number of prediction models have been published in recent years, their predictive performance, methodological quality, and major predictors have not been comprehensively evaluated in a systematic and quantitative manner. This study aims to evaluate the performance of these models and to identify common predictors associated with sepsis mortality. Methods - We systematically searched PubMed, Embase, Cochrane Library, and Web of Science for studies on sepsis mortality prediction models published up to July 1, 2025. Data were extracted and appraised using the Checklist for Critical Appraisal and Data Extraction for Systematic Reviews of Prediction Modeling Studies (CHARMS), and risk of bias was assessed with the Prediction Model Risk of Bias Assessment Tool for Artificial Intelligence (PROBAST+AI). Meta-analyses were performed to pool area under the curve of the receiver operating characteristic (AUC) metric of externally validated models and the odds ratio (OR) of common predictors. The study was registered in PROSPERO (CRD42024604119). Results - A total of 84 eligible studies were included, reporting 235 prediction models for sepsis mortality and involving approximately 2.7million patient records reported across studies, with 461, 387 deaths. Only 11(13.10%) studies encompassed model development, internal validation, and external validation. The included studies comprised 78(92.86%) retrospective cohort studies, 57(67.86%) studies developed in intensive care unit (ICU) settings, with MIMIC databases being among the most commonly used data sources. The most prevalent mortality endpoints were in-hospital (n=38, 45.24%), 28-day (n=23, 27.38%), and 30-day mortality (n=16, 19.05%). The included studies employed various modeling approaches, such as logistic regression (LR), random forest (RF), eXtreme Gradient Boosting (XGBoost), and K-nearest neighbors (KNN). Of the included studies, 46(54.76%) evaluated the calibration, 26(30.95%) conducted decision curve analysis, and 25(29.76%) applied SHAP for interpretability, while most did not provide visual model presentation (e.g., nomograms). The reported AUCs ranged from 0.590-0.976 for model development and 0.530-0.992 for internal validation. The pooled AUC of externally validated models, based on one representative model per study, was 0.794 (95% CI: 0.755-0.834), indicating moderate discriminative performance. Overall, the most commonly used predictors were age (n=19, 22.62%), lactate (n=13, 15.48%), albumin (n=8, 9.52%), SOFA score (n=8, 9.52%), and vasopressor (n=7, 8.33%). Notably, 64 (76.19%) studies and 50 (65.79%) studies were judged to have a high risk of bias in model development and model evaluation phases, respectively. Conclusion - Externally validated prediction models generally demonstrate moderate discriminative performance for predicting sepsis mortality, but a substantial proportion of these studies were evaluated as having a high risk of bias. Age, lactate, albumin, SOFA score, and vasopressor use were identified as predictors of mortality. Future studies with larger cohorts, rigorous designs, and multicenter external validation are warranted to improve their generalizability and facilitate clinical implementation. Systematic review registration - The unique registration identifier is CRD42024604119, and the publicly accessible website is https://www.crd.york.ac.uk/prospero/.Copyright © 2026 Lei, Ruan, Wang, Zhao, Zhao, Liu and Li

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13. **Early warning for acute pyelonephritis with sepsis: risk prediction model for patients without renal medullary necrosis lesions.**

Authors: Li, Bisheng;Yu, Shenglong;Liao, Yihao and Yuan, Honggang

Publication Date: 2026

Journal: Frontiers in Medicine 13, pp. 1845085

Abstract: Background: Sepsis is one of the key factors leading to mortality in hospitalized patients. Acute pyelonephritis, as a common upper urinary tract infection, serves as a significant source of infection, with some patients progressing to sepsis, which markedly increases mortality risk. This study aimed to utilize a large-scale public intensive care database (MIMIC-IV) to construct and validate a model specifically designed for predicting sepsis risk in such patients, thereby providing clinicians with accurate and practical early warning tools. Methods: This retrospective cohort study employed data from the MIMIC-IV database version 3.1, enrolling 663 patients. Demographic characteristics, comorbidities (Charlson Index), and multiple vital signs and laboratory parameters within the first 24h of hospital admission were collected. Patients were randomly divided into a model development set (465 cases) and an internal validation set (198 cases) at a 7:3 ratio. Univariate logistic regression, cross-validation LASSO regression, and multivariate logistic regression models were performed.

Discrimination was assessed using the area under the receiver operating characteristic curve (AUC), while calibration and decision curve analysis (DCA) were employed to evaluate calibration accuracy and clinical Sepsis incidence rates utility. Results: The sepsis incidence rates in the development set and validation set were 12.90 and 12.63%, respectively. LASSO regression identified five predictive variables for the final model: Charlson Index, bicarbonate, calcium, mean corpuscular volume (MCV), and admission age. Multivariate analysis revealed that the Charlson index (OR=1.10, 95% CI: 0.96-1.27), admission age (OR=1.02, 95% CI: 1.00-1.04), and MCV (OR=1.05, 95% CI: 1.00-1.10) were independent risk factors, while bicarbonate (OR=0.90, 95% CI: 0.83-0.98) and calcium (OR=0.27, 95% CI: 0.16-0.43) served as protective factors. The model demonstrated good apparent discrimination with AUCs of 0.820 (95% CI: 0.757-0.883) in the development set and 0.830 (95% CI, 0.737-0.924) in the validation set; internal bootstrap optimism correction yielded a bias-adjusted AUC of 0.805, confirming robustness against overfitting. Calibration was satisfactory, with decision curve analysis confirming net clinical benefit across threshold ranges of 1-80% (development) and 1-76% (validation). At the Youden-optimized cutoff of 0.194, the model achieved a sensitivity of 0.667 and specificity of 0.864 in the development set, and 0.600 and 0.803, respectively, in the validation set. Conclusion: This study successfully established a sepsis risk prediction model for acute pyelonephritis hospitalized patients without renal medullary necrosis lesions, based on five routine indicators. The model demonstrated excellent predictive performance and clinical utility in internal validation, providing a bedside quantitative tool for instantaneous risk stratification at hospital admission, facilitating early clinical vigilance and prioritized monitoring in this specific population. Copyright © 2026 Li, Yu, Liao and Yuan.

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14. **Construction and validation of a sepsis prediction model using inflammatory and hemodynamic markers in the emergency department.**

Authors: Lu, Rong;Zhang, Jing and Chen, Liang

Publication Date: 2026

Journal: Frontiers in Medicine 13, pp. 1837124

Abstract: Objective: To develop an early diagnosis prediction model for sepsis in the emergency department by integrating inflammatory, hemodynamic, and nursing assessment indicators. Methods: A retrospective cohort of 320 patients with suspected infection admitted to our hospital was enrolled. Participants were randomly allocated into a training set and a validation set at a 7:3 ratio. Key variables were selected using least absolute shrinkage and selection operator (LASSO) regression. Subsequently, logistic regression, random forest, and support vector machine models were constructed. Model performance and interpretability were evaluated using the receiver operating characteristic curve, calibration curve, decision curve analysis, and SHapley Additive exPlanations (SHAP) values. Results: LASSO regression identified three core variables: procalcitonin (PCT), neutrophil-to-lymphocyte ratio (NLR), and Modified Early Warning Score (MEWS). Multivariate analysis revealed that all three were independent risk factors (p Conclusion: The integrated model developed in this study exhibits moderate to satisfactory predictive performance and clinical utility. It may act as a candidate bedside risk-stratification tool pending further external multicenter validation for emergency nursing sepsis screening. Copyright © 2026 Lu, Zhang and Chen.

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15. **Interpretable Machine Learning Model for Predicting Sepsis and Septic Shock Among Patients with Documented Fever at Emergency Department Triage Using Patients' Historical Data.**

Authors: Maeng, Seung Jin;Lee, Ye Rim;Lee, Se Uk;Yu, Jae Yong;Choi, Jung Won;Lee, Guntak;Park, Jong Eun;Shin, Tae Gun;Hwang, Sung Yeon;Yoon, Hee;Cha, Won Chul;Kim, Taerim;Kim, Minha;Chang, Hansol and Heo, Sejin

Publication Date: Jul 21 ,2026

Journal: Journal of Medical Systems 50(1)

Abstract: This study aimed to develop an interpretable machine learning-based scoring system for predicting sepsis and septic shock among febrile patients at emergency department (ED) triage using longitudinal data. This retrospective, single-center study included adult patients, presented to ED of tertiary academic hospital with fever from January 2016 to December 2021. Using the AutoScore framework, we developed a novel scoring system for predicting sepsis and septic shock at the triage stage, incorporating nine variables and a maximum score of 29. The predictive performance of our score was assessed by calculating the area under the receiver operating characteristic curve (AUROC), and its performance was compared with that of two existing scoring systems: the quick Sequential Organ Failure Assessment (qSOFA) and the Modified Early Warning Score (MEWS). Our model incorporated nine variables including initial vital signs, age, baseline platelet count, total bilirubin, and creatinine levels. Among these, initial systolic blood pressure was identified as the most important predictor. AUROC of our model was 0.844 (95% confidence interval [CI], 0.812-0.875) in predicting septic shock and 0.703 (95% CI, 0.687-0.720) for sepsis. Compared to qSOFA >= 2 (AUROC: 0.605) and MEWS >= 5 (AUROC: 0.678), our scoring system demonstrated superior predictive performance for septic shock. For comparable specificity levels (ranging from 0.50 to 0.95), our scoring system achieved higher sensitivity than MEWS. Our scoring system is an interpretable and practical scoring tool for predicting sepsis and septic shock among patients with documented fever at ED triage using patient's longitudinal data. Copyright © 2026. The Author(s).

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16. **Vitamin D and Mortality in Adult Patients with Sepsis: A Systematic Review and Meta-analysis.**

Authors: Najfi N.;Bagodi S. and Ramya, T. N.

Publication Date: 2026

Journal: International Journal of Life Sciences Biotechnology and Pharma Research 15(8), pp. 605–611

Abstract: Background: Sepsis remains one of the leading causes of mortality among critically ill adults worldwide. Vitamin D possesses immunomodulatory, anti-inflammatory, endothelial-protective, and antimicrobial properties that may influence the pathogenesis and outcomes of sepsis. Vitamin D deficiency is highly prevalent among critically ill patients and has been associated with adverse clinical outcomes.1-4 Objective: To systematically evaluate available evidence regarding the association between vitamin D status and mortality among adult patients with sepsis and to summarize evidence regarding vitamin D supplementation in this population. Method(s): A systematic review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 recommendations. Electronic databases including PubMed, Embase, Web of Science, and the Cochrane Library were searched from inception to February 2025. Studies enrolling adults (>=18 years) with sepsis that evaluated serum 25-hydroxyvitamin D concentrations or vitamin D supplementation and reported mortality outcomes were eligible. Risk of bias was assessed using validated instruments appropriate to study design. Result(s): Published evidence consistently demonstrates a high prevalence of vitamin D deficiency among adults with sepsis. Observational studies report that deficient vitamin D levels are associated with increased short-term mortality, while recent meta-analyses suggest vitamin D supplementation may reduce 28-day, 90-day, and in-hospital mortality; however, the certainty of evidence is low because of heterogeneity and limited randomized trials. Current international sepsis guidelines therefore do not recommend routine vitamin D therapy for sepsis treatment. Conclusion(s): Vitamin D deficiency appears to be an important prognostic marker in adult sepsis. Although supplementation shows promising signals in recent pooled analyses, definitive evidence demonstrating improved survival remains insufficient. Large multicenter randomized controlled trials are required before routine vitamin D therapy can be recommended.Copyright ©2026 Int. J. Life Sci. Biotechnol. Pharma. Re

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17. **Risk factors for sepsis: a systematic review and meta-analysis.**

Authors: Qin, Chu;Lin, Sisi;Pang, Lisha;Hu, Mahong;Ma, Dieyu;Zhou, Zhizhen;Xu, Xiujuan and Ji, Conghua

Publication Date: 2026

Journal: Frontiers in Public Health 14, pp. 1790141

Abstract: Objective: This study aims to identify key risk factors for the incidence of sepsis through a systematic review and meta-analysis, thereby providing evidence-based medical evidence for its primary prevention and early identification. Methods: Systematic searches were conducted across eight Chinese and English databases (CNKI, Wanfang, SinoMed, VIP, PubMed, Web of Science, Embase, Cochrane Library) from their inception to January 2025. Study selection, data extraction, and quality assessment were performed independently by two reviewers. Meta-analysis was then carried out using RevMan software. Effect sizes were pooled using either fixed- or random-effects models based on heterogeneity, and sensitivity analyses were performed for outcomes with high heterogeneity. Results: A total of 12,536 records were identified, and 23 studies met the eligibility criteria, of which 21 studies were included in the quantitative meta-analysis. The pooled analyses identified 19 significant factors associated with sepsis incidence, including 18 risk factors and 1 protective factor. The risk factors identified were: age (>=60years and per-year increase), male sex, low BMI (2, GCS score 2, GCS score Conclusion: This study provides a comprehensive review of risk factors for the incidence of sepsis. Correct identification of these risk factors and early implementation of interventions should be prioritized to reduce the incidence of sepsis. Copyright © 2026 Qin, Lin, Pang, Hu, Ma, Zhou, Xu and Ji.

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18. **In-hospital outcomes of sepsis hospitalizations among patients with cardiac amyloidosis: A 2022 National inpatient sample analysis.**

Authors: Saad A.M.;Eid F.;Abozenah M.;Valania G.E. and Goldsweig, A. M.

Publication Date: 2026

Journal: Current Problems in Cardiology 51(10) (pagination), pp. Article Number: 103404. Date of Publication: 01 Oct 2026

Abstract: Background Cardiac amyloidosis is characterized by restrictive physiology and limited hemodynamic reserve. Sepsis management often relies on aggressive fluid resuscitation, which may pose risks in patients with noncompliant ventricles and fixed stroke volume. Whether cardiac amyloidosis independently worsens sepsis outcomes remains unknown. Objectives To evaluate the association between cardiac amyloidosis and outcomes in adults admitted with primary sepsis. Methods Adults with primary sepsis were identified in the 2022 National Inpatient Sample. Patients with and without cardiac amyloidosis were compared using ICD-10-CM codes. The primary outcome was in-hospital mortality. Survey-weighted multivariable logistic regression adjusted for demographics, comorbidity burden, and hospital characteristics was performed, with propensity matching as sensitivity analysis. Results Among 477,039 unweighted sepsis admissions, 500 had cardiac amyloidosis. In-hospital mortality was higher with cardiac amyloidosis than without (22.4% vs 10.7%; P Copyright © 2026 Elsevier Inc.

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19. **Sepsis of urinary vs non-urinary tract origin in nonagenarians and centenarians admitted to Australian and New Zealand intensive care units: a propensity-matched multicentre cohort analysis.**

Authors: Suh, Je Min;Weinberg, Laurence;Tran, Kaden;Raykateeraroj, Nattaya;Pilcher, David and Lee, Dong-Kyu

Publication Date: 08 03 ,2026

Journal: BMJ Open 16(8), pp. e114774

Abstract: OBJECTIVES: To compare clinical outcomes between urinary and non-urinary tract sepsis in nonagenarians and centenarians admitted to intensive care units (ICUs). DESIGN: Retrospective propensity score-matched multicentre cohort study. SETTING: Adult ICUs participating in the Australian and New Zealand Intensive Care Society Adult Patient Database across Australia and New Zealand (2010-2023). PARTICIPANTS: We included all ICU admissions for sepsis in patients aged 90 years or older, classified as urinary or non-urinary tract sepsis using Acute Physiology and Chronic Health Evaluation III-J diagnostic codes. After 1:1 nearest neighbour propensity score matching, 1130 patients (565 per group) were included. PRIMARY AND SECONDARY OUTCOME MEASURES: The primary outcome was all-cause mortality within 180 days and beyond 180 days. Secondary outcomes included ICU mortality, hospital mortality, ICU length of stay and hospital length of stay. RESULTS: Of 1669 patients, 573 had urinary tract sepsis and 1096 had non-urinary tract sepsis. After matching, 1130 patients were included (565 per group). In the matched cohort, non-urinary tract sepsis was associated with higher mortality within 180 days than urinary tract sepsis (HR 1.67, 95% CI 1.33 to 2.09, p: Of 1669 patients, 573 had urinary tract sepsis and 1096 had non-urinary tract sepsis. After matching, 1130 patients were included (565 per group). In the matched cohort, non-urinary tract sepsis was associated with higher mortality within 180 days than urinary tract sepsis (HR 1.67, 95% CI 1.33 to 2.09, pCONCLUSIONS: Among nonagenarian and centenarian ICU patients with sepsis, infection source was an important determinant of early but not late mortality, with non-urinary tract sepsis conferring a higher risk than urinary tract sepsis. Incorporating infection source and simple physiological markers alongside illness severity scores may improve prognostication and support shared decision-making in this very old population. Copyright © Author(s) (or their employer(s)) 2026. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ Group

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20. **Patient Care Bundle to Reduce Neutropenic Sepsis, Hospital Admissions, and Treatment Delays.**

Authors: Villacres, Stephany;Tariman, Joseph D. and Stubin, Catherine A.

Publication Date: Aug 03 ,2026

Journal: Clinical Journal of Oncology Nursing 30(4), pp. 270–274

Abstract: Chemotherapy-induced neutropenia is a frequent complication in patients with cancer that can lead to severe outcomes like sepsis, hospitalizations, and treatment delays. A neutropenic sepsis care bundle was implemented in an.

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21. **Longitudinal immune-inflammatory profiles and mortality in older adults with sepsis: a multicentre prospective cohort study.**

Authors: Wang, Xianwen;Fu, Miaomiao;Li, Chunhui;Jin, Jialin;Cui, Na;Liao, Xuelian;Wang, Zhanwen;Zuo, Zhihong;Huang, Qihang;Zhang, Lina and Qian, Zhaoxin

Publication Date: Jul 04 ,2026

Journal: Journal of Intensive Care 14(1)

Abstract: BACKGROUND: Older adults are at high risk of sepsis, but the immune-inflammatory features distinguishing sepsis from nonsevere infection and their prognostic relevance remain incompletely defined. We aimed to characterize immune-inflammatory profiles across the older adult infection spectrum and evaluate their longitudinal association with in-hospital mortality. METHODS: In this multicentre prospective observational cohort, 1,851 participants aged >= 60 years were enrolled, including healthy controls, patients with nonsevere infection, and patients with sepsis. Immune-cell subsets, cytokines, complement components, and routine laboratory indices were assessed. Adjusted cross-sectional comparisons were performed using multivariable linear regression. Among patients with

sepsis, model-estimated longitudinal profiles from intensive care unit (ICU) day 1 to day 7 were analysed using linear mixed-effects models among available scheduled measurements, and day-1 biomarkers associated with in-hospital mortality were evaluated using Cox regression. RESULTS: The cohort included 524 healthy controls, 511 patients with nonsevere infection, and 816 patients with sepsis. Across the infection spectrum, sepsis was characterized by progressively lower circulating lymphocyte, T-cell, cluster of differentiation 8 (CD8+) T-cell, and natural killer (NK)-cell counts, together with higher interleukin (IL)-6, IL-8, and IL-10 levels. These differences remained after adjustment for age, sex, and major comorbidities. Among patients with available follow-up measurements, non-survivors had consistently higher Sequential Organ Failure Assessment (SOFA) scores, IL-6, and IL-10 and lower lymphocyte, T-cell, CD8+ T-cell, NK-cell, and complement component 3 (C3) levels. No time-by-outcome interaction remained significant after false-discovery-rate correction. In multivariable Cox models, higher day-1 SOFA score and IL-10 were associated with increased in-hospital mortality, whereas higher NK-cell count was associated with lower mortality. CONCLUSIONS: In older adults, sepsis was associated with an adjusted circulating immune-inflammatory pattern characterized by lower cellular immune markers and higher cytokine levels. This separation was evident on ICU day 1 and remained observable among patients with available follow-up measurements. Given the observational design, these associations should not be interpreted as causal. Copyright © 2026. The Author(s).

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22. **The incidence and risk factors of sepsis following ovarian cancer surgery: A retrospective Nationwide Inpatient Sample database study.**

Authors: Wang, Yu;Zheng, Jing;Lv, Qun;Xu, Guang-Min;Xie, Hao;Dong, Bo-Fei and Wang, Xue

Publication Date: 2026

Journal: PLoS ONE [Electronic Resource] 21(7), pp. e0353675

Abstract: BACKGROUND: Postoperative sepsis is a significant complication following ovarian cancer surgery. However, limited studies have explored the risk factors associated with postoperative sepsis following ovarian cancer surgery in this context. This study aimed to assess the prevalence of postoperative sepsis and identify its associated risk factors. METHODS: This study retrospectively analyzed data from patients who underwent ovarian cancer surgery between January 2010 and December 2019 using the Nationwide Inpatient Sample (NIS) database. The age range of the study population is between 18 and 99 years old. Patients were categorized into two groups based on the presence or absence of postoperative sepsis. Data on patient demographics (e.g., race, age), hospital characteristics (e.g., insurance type, bed size, teaching status, region), preoperative comorbidities, and postoperative complications were extracted for comparison. Univariate and multivariable logistic regression analysis were conducted to identify factors associated with postoperative sepsis. RESULTS: A total of 39,049 patients were identified in the NIS database. Among them, 1,288 cases of postoperative sepsis were observed, representing an incidence rate of 3.3%. Patients with postoperative sepsis exhibited higher hospital charges, advanced age, prolonged length of stay (LOS), and increased in-hospital mortality. Preoperative risk factors for postoperative sepsis included congestive heart failure, coagulopathy, metastatic cancer, etc. Postoperative sepsis was associated with major complications, including electrolyte imbalance, urinary tract infection, thrombocytopenia, etc. CONCLUSIONS: The incidence of postoperative sepsis following ovarian cancer surgery has shown a slight increase over time. Postoperative sepsis is associated with advanced age, race, prolonged LOS, higher hospital charges, in-hospital mortality, preoperative comorbidities, and perioperative complications. Recognizing these risk factors is essential for improving patient prognosis. Copyright: © 2026 Wang et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

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23. **Improved 28-day mortality prediction by combining Lactate Dehydrogenase-to-Albumin Ratio(LAR) to lactate-enhanced Sequential Organ Failure Assessment (SOFA) score in patients with sepsis: a derivation and validation study.**

Authors: Wang, Zhiyang;You, Tao;Liu, Yujie;Li, Shifeng;Xiao, Xin;Shao, Bin;Yao, Yunnan;Zhang, Yanpeng;Lu, Yajing;Huang, Fang and Wang, Jun

Publication Date: Jul 14 ,2026

Journal: BMC Infectious Diseases 26(1)

Abstract: BACKGROUND: Fast risk stratification is essential for patients with sepsis, a life-threatening condition associated with high mortality, as it guides clinical decision-making and management. In this study, we aimed to evaluate the predictive performance of a novel model-termed SOLAR-which integrates the lactate dehydrogenase-to-albumin ratio (LAR) with the Sequential Organ Failure Assessment (SOFA) score and lactate for 28-day mortality in sepsis. METHODS: Data for the derivation cohort were collected from the Medical Information Mart for Intensive Care IV database. The validation cohort was from the Department of Critical Care Medicine at the First Affiliated Hospital of Soochow University. Patients admitted to ICU for sepsis were enrolled. Model performance was analyzed by using multivariable logistic regression and Harrell's c-index. Reclassification ability of the model was evaluated by using net reclassification index (NRI) and Integrated discrimination improvement (IDI). Benefits in clinical decision making was estimated by using decision curve analysis. Super learner analysis was used to identify the optimal machine learning algorithm for model construction. Nomograms and an online calculator were used to deploy the model for point-of-care utilization. RESULTS: The derivation cohort comprised 4936 patients with sepsis and sufficient SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P : The derivation cohort comprised 4936 patients with sepsis and sufficient SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P : The derivation cohort comprised 4936 patients with sepsis and sufficient SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P : The derivation cohort comprised 4936 patients with sepsis and sufficient SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P : The derivation cohort comprised 4936 patients with sepsis and sufficient SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P : The derivation cohort comprised 4936 patients with sepsis and sufficient SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P : The derivation cohort comprised 4936 patients with sepsis and sufficient

SOFA, LAR, and lactate data were obtained from MIMIC database. The validation cohort contained 371 patients with sepsis admitted to the First Affiliated Hospital of Soochow University. In both cohorts, an increasing trend of 28-day mortality was observed with elevating SOFA scores, lactate levels, and LAR quartiles. Compared to the SOFA-lactate score, the SOLAR score demonstrated improved 28-day mortality discrimination, reflected by an increase in c-index (Derivation cohort: 0.695 [0.680-0.711] vs. 0.660 [0.644-0.676], P CONCLUSION: The SOLAR score combining LAR, SOFA score and lactate provides improved accuracy and sensitivity over the SOFA-lactate score for 28-day mortality prediction in sepsis. Copyright © 2026. The Author(s).

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24. **The Sepsis ImmunoScore Predicts Sepsis, Mortality, and Deterioration Better than Clinical Scores and Widely Available Biomarkers.**

Authors: Watson, Gregory L.;Updike, Lincoln C.;Lopez-Espina, Carlos G.;Bhargava, Akhil;Schmalz, Lee A.;Khan, Shah;Urdiales, Dennys S.;Sims, Matthew D.;Palagiri, Ashok V.;Haimovich, Adrian D.;Dagan, Alon;Davis, Benjamin P.;White, Karen C.;Gurbel, Paul A.;Mayer, Stockton M.;Syed, Anwaruddin;Zhao, Sihai Dave;Zhu, Ruoqing;Bashir, Rashid;Shapiro, Nathan I., et al

Publication Date: Jun 24 ,2026

Journal: Diagnostics 16(13)

Abstract: Background: Early and accurate risk stratification of patients suspected of serious infection is essential for improving outcomes, but existing diagnostic and predictive tools have limited accuracy. The objective was to compare the performance of an FDA-authorized AI diagnostic test, the Sepsis ImmunoScore, against widely available biomarkers and clinical tools for diagnosis of sepsis and prediction of in-hospital mortality and intensive care unit (ICU) admission. Methods: This multicenter observational study included 6027 adult patients suspected of infection across 7 U.S. hospital sites. The Sepsis ImmunoScore's predictive performance was compared to the sequential organ failure assessment (SOFA) score, procalcitonin (PCT), C-reactive protein (CRP), Systemic Inflammatory Response Syndrome (SIRS) score, National Early Warning Score (NEWS), and quick SOFA (qSOFA). Primary outcomes included sepsis as defined by Sepsis-3 criteria, in-hospital mortality, and ICU admission. Predictive accuracy was assessed using area under the receiver operating characteristic curve (AUC), and 95% confidence intervals were generated and hypothesis testing conducted using the bootstrap method. Results: The Sepsis ImmunoScore demonstrated statistically significant superior performance across all outcomes. For sepsis prediction, the Sepsis ImmunoScore achieved an AUC of 0.82, compared to SOFA (0.72), procalcitonin (PCT) (0.70), C-reactive protein (CRP) (0.61), SIRS (0.59), NEWS (0.69), and qSOFA (0.67). For in-hospital mortality prediction, the Sepsis ImmunoScore achieved an AUC of 0.80, outperforming SOFA (0.72), PCT (0.67), CRP (0.58), SIRS (0.60), NEWS (0.72), and qSOFA (0.69). For ICU admission, the Sepsis ImmunoScore reached an AUC of 0.74, superior to SOFA (0.63), PCT (0.64), CRP (0.54), SIRS (0.60), NEWS (0.70), and qSOFA (0.65). All differences between the Sepsis ImmunoScore and comparators were statistically significant. Conclusions: The Sepsis ImmunoScore significantly improved predictive accuracy for sepsis, in-hospital mortality, and ICU admission compared to six conventional clinical scores and biomarkers. This AI-based tool may enhance risk stratification and clinical decision-making, potentially leading to more timely sepsis interventions and improved outcomes.

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25. **Lactate dehydrogenase-to-albumin ratio predicts mortality in mechanically ventilated patients with CAP-associated sepsis: a MIMIC-IV study with external validation.**

Authors: Wen K.;Zhao T.;Han X.;Tan R.;Guo H.;Li L.;Wang J. and Du, Q.

Publication Date: 2026

Journal: European Journal of Medical Research 31(1) (pagination), pp. Article Number: 1136. Date of Publication: 01 Dec 2026

Abstract: Background: Community-acquired pneumonia (CAP) complicated by sepsis is associated

with high mortality, particularly among critically ill patients requiring mechanical ventilation. Reliable and easily obtainable biomarkers for early risk stratification remain limited. This study aimed to evaluate the prognostic value of the lactate dehydrogenase-to-albumin ratio (LDAR) for predicting mortality in mechanically ventilated patients with CAP-associated sepsis. Method(s): This retrospective cohort study included 866 mechanically ventilated patients with CAP-associated sepsis from the MIMIC-IV database, with external validation using an independent cohort of 232 patients from Hebei Provincial People's Hospital. Patients were stratified according to LDAR quartiles. Cox proportional hazards models and logistic regression analyses were performed to assess the association between LDAR and mortality outcomes. Restricted cubic spline analysis was used to explore the dose-response relationship between LDAR and mortality. Kaplan-Meier survival analysis, subgroup analyses, and receiver operating characteristic (ROC) curve analysis were conducted to evaluate prognostic performance. Machine learning models were further developed, and model interpretability was assessed using SHAP analysis. Result(s): Higher LDAR levels were significantly associated with increased risks of both 28-day ICU mortality and in-hospital mortality. In the multivariable Cox model, patients in the third and fourth LDAR quartiles had significantly higher risks of 28-day mortality compared with those in the lowest quartile (HR 1.85, 95% CI 1.22-2.81; HR 1.68, 95% CI 1.09-2.58, respectively). Logistic regression analysis showed similar associations with hospital mortality. Restricted cubic spline analysis demonstrated a positive relationship between LDAR and mortality risk. Kaplan-Meier analysis revealed significantly lower survival probabilities in patients with higher LDAR levels. ROC analysis indicated that incorporating LDAR into the baseline clinical model improved predictive performance (AUC 0.688). External validation confirmed the robustness of these findings (AUC 0.724). Machine learning analysis identified LDAR as one of the most important predictors of mortality. Conclusion(s): LDAR is an independent and readily available biomarker associated with mortality risk in mechanically ventilated patients with CAP-associated sepsis. Incorporating LDAR into conventional clinical models may improve early risk stratification and prognostic assessment in critically ill patients. Clinical trial number This article is a retrospective study on the MIMIC database. Data from Hebei Provincial People's Hospital were incorporated into this study as an external validation data source for this dataset, in accordance with 2025-LW-0170, to get patient consent.Copyright © The Author(s) 2026.

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26. **Development and validation of a sepsis-specific systemic inflammation classification system for mortality prediction.**

Authors: Wu Z.;Cao J.;Zhang Q.;Lei R.;Hu Y.;Zhang S.;Lan C.;Wang P. and Sun, T.

Publication Date: 2026

Journal: Frontiers in Medicine 13(pagination), pp. Date of Publication: 26 Jun 2026

Abstract: Background - The role of nutrition and systemic inflammation in the prognosis of sepsis remains unclear. This study aimed to evaluate the predictive value of existing nutrition/inflammation-based indices for mortality in sepsis patients and to develop a sepsis-specific systemic inflammation classification (SSIC) system. Methods - Using the MIMIC-IV 3.0 database, we investigated and compared the predictive value of 18 nutrition/inflammation-based indices for mortality in sepsis patients admitted to the intensive care unit (ICU). These indices were calculated from biochemical tests and anthropometric measurements at ICU admission. The SSIC system was established by combining existing indices and validated in an independent institutional cohort. Results - Analysis of 11, 577 sepsis patients from the MIMIC-IV 3.0 database revealed that seven of the 18 nutrition/inflammation-based indices had predictive value for in-hospital and in-ICU mortality, albeit with low discriminative ability. The neutrophil-to-lymphocyte ratio (NLR) and glucose-to-lymphocyte ratio (GLR), both of which focus on systemic inflammation, demonstrated the best predictive performance in both indirect and direct comparisons. The SSIC system, which combines NLR and GLR, classified systemic inflammation risk into low, moderate, and high categories. This system improved discriminative ability for mortality and showed consistent predictive value across different subpopulations. Moreover, adding the SSIC system to existing severity scores enhanced their discriminative performance for sepsis mortality. The utility of the SSIC system was validated in an independent institutional cohort of 496 sepsis patients. Conclusion - This study confirmed the predictive value of 18 nutrition/inflammation-based indices for

mortality in sepsis patients. The SSIC system was established and validated as a tool for mortality risk stratification and may be considered for further evaluation alongside established severity scores.Copyright © 2026 Wu, Cao, Zhang, Lei, Hu, Zhang, Lan, Wang and Sun.

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27. **Association between nutritional status and sepsis-induced coagulopathy: a multicenter retrospective cohort study.**

Authors: Zhang, Jiyuan;Tang, Lujia;Feng, Zhihui;Ma, Chaoping;Xu, Peixian;Ye, Jiawei and Gao, Chengjin

Publication Date: 2026

Journal: Frontiers in Nutrition 13, pp. 1894405

Abstract: Background: Malnutrition and sepsis-induced coagulopathy (SIC) are common and critical complications in septic patients. This study aimed to evaluate the association between nutritional status and SIC, as well as their combined effects on clinical outcomes in adult septic patients. Methods: This retrospective study extracted data from the MIMIC-IV v3.1 and eICU databases, and additionally enrolled adult patients with sepsis who received treatment at Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine from 2021 to October 2022. Baseline clinical characteristics were compared between patients with and without SIC, and between patients with and without nutritional risk. Logistic regression models were constructed to identify independent risk factors for SIC, and restricted cubic spline curves were plotted to visualize dose-response relationships. The Random Forest machine learning method was used to evaluate the association between nutritional indicators and SIC. We used Spearman correlation analysis to investigate the relationship between nutritional indicators and SOFA and SIC scores, as well as coagulation indicators. The associations among nutritional indicators were assessed using logistic proportional hazards models, and interactions were examined on both additive and multiplicative scales. Results: Patients with SIC had lower Geriatric Nutritional Risk Index (GNRI) and Prognostic Nutritional Index (PNI) scores and higher mortality rates, with statistically significant differences observed in the MIMIC and eICU cohorts (p p p Conclusion: Malnutrition and SIC are associated with higher mortality rates in sepsis. Nutritional status is independently associated with the risk of SIC in adults. Copyright © 2026 Zhang, Tang, Feng, Ma, Xu, Ye and Gao.

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28. **Obesity and early sepsis-associated acute respiratory distress syndrome: A prospective multicenter study.**

Authors: Zhao, Lina;Li, Yun;Lin, Xuezhen;Cui, Qian;Liu, Jie;Yang, Fei;Wang, Yunying;Wang, Jingchao;Liu, Yanan;Shi, Xiaopeng;Cao, Dongming;Li, Jing;Su, Fuhong;Zhang, Haibo and Xie, Keliang

Publication Date: Sep ,2026

Journal: Respiratory Medicine 261, pp. 109007

Abstract: PURPOSE: The role of obesity in sepsis-associated acute respiratory distress syndrome (SA-ARDS) remains uncertain, particularly amid evolving diagnostic criteria. We aimed to assess whether obesity differentially influences SA-ARDS incidence and mortality under the Berlin definition versus an expanded framework incorporating high-flow nasal cannula (HFNC). METHODS: This prospective multicenter cohort study included 1799 adults with sepsis 3.0 from three ICUs. SA-ARDS was diagnosed using (1) Berlin criteria and (2) a new definition integrating HFNC. The primary outcome was incidence of SA-ARDS. Secondary outcomes included 28- and 90-day mortality in SA-ARDS patients. RESULTS: Obesity was independently associated with elevated SA-ARDS incidence under the new definition (adjusted OR 5.61, 95% CI 4.56-6.92; AUC=0.700), with even higher risk in ARDS patients under Berlin criteria (OR 6.66, 95% CI 5.01-8.91) and HFNC recipients (OR 5.77, 95% CI 3.85-8.85). These associations remained robust in PSM and IPW analyses. However, in ARDS patients of the new definition (including HFNC patients), no survival differences were observed across BMI categories. However, under the Berlin definition, obesity patients had significantly lower 90-day

mortality than underweight and normal-weight patients, particularly in the elderly and those with prolonged hospital stays (P: Obesity was independently associated with elevated SA-ARDS incidence under the new definition (adjusted OR 5.61, 95% CI 4.56-6.92; AUC=0.700), with even higher risk in ARDS patients under Berlin criteria (OR 6.66, 95% CI 5.01-8.91) and HFNC recipients (OR 5.77, 95% CI 3.85-8.85). These associations remained robust in PSM and IPW analyses. However, in ARDS patients of the new definition (including HFNC patients), no survival differences were observed across BMI categories. However, under the Berlin definition, obesity patients had significantly lower 90-day mortality than underweight and normal-weight patients, particularly in the elderly and those with prolonged hospital stays (PCONCLUSIONS: Obesity independently increased SA-ARDS risk across both diagnostic frameworks. However, the mortality benefit (Berlin definition) was absent when using the expanded criteria incorporating HFNC. This indicates obesity drives susceptibility but confers no universal survival advantage in new ARDS cohorts. Copyright © 2026. Published by Elsevier Ltd.

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