

Sepsis

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April 2026

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1. Comparing dynamic presepsin and procalcitonin measurements in septic adults: development and testing of a mortality risk in sepsis summation score.

Authors: Algethamy H.M.;Aboudeif M.M.;Ali M.A.M.;Amin A.M. and Amin, S. N.

Publication Date: 2026

Journal: Anaesthesia, Pain and Intensive Care 30(2), pp. 248–262

Abstract: Background & Objective: Though numerous biomarkers have been identified with diagnostic and/or prognostic value in sepsis patients; few are sensitive early enough to guide early decision-making. Presepsin (PSEP) appears to spike within the first few days of systemic bacterial infection. We evaluated PSEP's sensitivity, specificity, accuracy, and area-under-the-curve (AUC) predicting sepsis-related mortality, both used alone and combined with other parameters. Methodology: A prospective study was conducted of N = 84 adult sepsis patients admitted to critical care units (CCU) at a single, university-affiliated tertiary hospital. All were followed until either death or 90 days after CCU admission, with biomarkers including PSEP and procalcitonin (PCT) measured on days 1, 3, 5, 7 and 12. Bivariable analysis was conducted to identify potential predictors of mortality for use in multivariable analysis and ultimate evaluation of a mortality risk in sepsis summation score. Result(s): Among 84 patients, 44 died, 12 remained hospitalized, and 28 were discharged home. At all five blood draws, PSEP levels were significantly higher in sepsis non-survivors than survivors, versus no instances with PCT. Multivariable analysis identified three statistically significant predictors of mortality: patient age, baseline SOFA score, and the average of patients' day 1 and 3 PSEP levels. From these three variables, all attained within the first 72 hours of CCU admission, a 9-point scale was constructed that was 83.8% sensitive, 71.1% specific, and 77.3% accurate predicting ultimate sepsis-related mortality (AUC = 0.80). Conclusion(s): Alone and combined with patient age and baseline SOFA score, early PSEP levels are highly sensitive and specific predicting sepsis-related mortality. Copyright © 2026, Faculty of Anaesthesia, Pain and Intensive Care, AFMS. All rights reserved. URL:

2. Electrical Risk Score derived from standard ECG predicts mortality in sepsis patients presenting to the emergency department: ERS and sepsis mortality in ED patients.

Authors: Ayyildiz F.A.;Ayyildiz A.;Yildiz G.;Ata A.R. and Yildirim, O. T.

Publication Date: 2026

Journal: Heart and Lung 77(pagination), pp. Article Number: 102771. Date of Publication: 01 May 2026

Abstract: Background: Sepsis remains a leading cause of morbidity and mortality among patients presenting to the emergency department (ED), and early risk stratification is crucial for clinical decision-making. However, commonly used severity scores rely on laboratory parameters and may not be readily applicable at initial ED presentation. Objective(s): This study aimed to investigate the association between an electrocardiography-derived Electrical Risk Score (ERS) calculated at ED admission and in-hospital mortality in sepsis patients requiring intensive care unit (ICU) admission, and to compare its prognostic performance with the Sequential Organ Failure Assessment (SOFA) score. Method(s): In this retrospective cohort study, adult patients diagnosed with sepsis in the ED and subsequently admitted to the ICU between January 2023 and December 2024 were analyzed. ERS was calculated from standard 12-lead ECGs obtained at ED presentation based on six predefined electrocardiographic parameters. SOFA and APACHE II scores were recorded at ICU admission. Demographic characteristics, comorbidities, laboratory findings, mechanical ventilation requirement, and clinical outcomes were retrieved from electronic medical records. Multivariable logistic regression analysis was performed to identify independent predictors of in-hospital mortality. Result(s): Of 256 patients, 164 (64.1 %) died in hospital. Non-survivors were older and had higher SOFA (median 10 vs. 6.5, p Result(s): Of 256 patients, 164 (64.1 %) died in hospital. Non-survivors were older and had higher SOFA (median 10 vs. 6.5, p Conclusion(s): ERS calculated from admission ECGs was independently associated with in-hospital mortality in sepsis patients admitted from the ED to the ICU. These findings suggest that ERS may serve as a complementary, hypothesis-generating risk marker for early risk stratification, pending further prospective validation. Copyright © 2026 Elsevier Inc. URL:

3. Diagnostic accuracy of septicite rapid to discriminate sepsis from non-infectious critical illness in patients meeting sepsis criteria according to sepsis-3 definition at icu admission.

Authors: CantonBulnes M.L.;GarciaGarmendia J.L.;Estella A.;FernandezGalilea A.;Blanco I.;EstechaFonca M.A.;GordilloResina M.;RodriguezGomez J.;PinedaCapitan J.J.;MartinezFernandez C.;EscorescaOrtega A.;AmayaVillar R.;MoraOrdonez J.;GonzalezSoto S. and GarnachoMontero, J.

Publication Date: 2026

Journal: European Journal of Clinical Microbiology and Infectious Diseases (pagination), pp. Date of Publication: 2026

Abstract: Objectives: The aim of this study was to validate the SeptiCyte RAPID assay, a molecular test to distinguish sepsis from sterile inflammation, by determining its diagnostic accuracy in critically ill patients who meet criteria for sepsis according to Sepsis-3 definition on ICU admission Design: This is an observational, prospective, and multicenter study. Setting(s): Carried out in seven hospitals in Andalusia (Spain). A 2.5 mL whole blood sample was collected and tested in a SeptiCyte RAPID kit on a real time PCR platform (Idylla™). A score from 0 to 15 (SeptiScore™) was generated that falls into four bands based on the increasing likelihood of infection-positive systemic inflammation. Patient(s): Patients aged 18 years or older, admitted to the ICU with a diagnosis of sepsis. Main Result(s): We enrolled 354 patients, of whom 86 (24.3%) did not present sepsis at the researchers' discretion. SeptiCyte RAPID showed an AUC of [0.84 (CI95% 0.79-0.87)] for differentiating sepsis from sterile systemic inflammation. SeptiCyte RAPID was significantly better for sepsis diagnosis than CRP [0.75 (CI95% 0.70-0.80)] (p =0.003) but without significant differences with PCT [0.80 (CI95% 0.75-0.84)]. SeptiScore distribution in patients with sepsis was higher than patients with sterile inflammation, with a PPV of 68.8% and 92.2% (Bands 3 and 4) for sepsis diagnosis and a PPV of 100% for sterile inflammation (Band 1). Independent risk factors for sepsis were estimated probability of sepsis [OR 8.02 (CI 95% 4.50-14.28), pMain Result(s): We enrolled 354 patients, of whom 86 (24.3%) did not present sepsis at the researchers' discretion. SeptiCyte RAPID showed an AUC of [0.84 (CI95% 0.79-0.87)] for differentiating sepsis from sterile systemic inflammation. SeptiCyte RAPID was significantly better for sepsis diagnosis than CRP [0.75 (CI95% 0.70-0.80)] (p =0.003) but without significant differences with PCT [0.80 (CI95% 0.75-0.84)]. SeptiScore distribution in patients with sepsis was

higher than patients with sterile inflammation, with a PPV of 68.8% and 92.2% (Bands 3 and 4) for sepsis diagnosis and a PPV of 100% for sterile inflammation (Band 1). Independent risk factors for sepsis were estimated probability of sepsis [OR 8.02 (CI 95% 4.50-14.28), pMain Result(s): We enrolled 354 patients, of whom 86 (24.3%) did not present sepsis at the researchers' discretion. SeptiCyte RAPID showed an AUC of [0.84 (CI95% 0.79-0.87)] for differentiating sepsis from sterile systemic inflammation. SeptiCyte RAPID was significantly better for sepsis diagnosis than CRP [0.75 (CI95% 0.70-0.80)] (p =0.003) but without significant differences with PCT [0.80 (CI95% 0.75-0.84)]. SeptiScore distribution in patients with sepsis was higher than patients with sterile inflammation, with a PPV of 68.8% and 92.2% (Bands 3 and 4) for sepsis diagnosis and a PPV of 100% for sterile inflammation (Band 1). Independent risk factors for sepsis were estimated probability of sepsis [OR 8.02 (CI 95% 4.50-14.28), pConclusion(s): SeptiCyte RAPID discriminates sepsis from sterile inflammation in critically ill adults, adding value to the diagnosis of sepsis. Purpose(s): The aim of this study was to validate the SeptiCyte RAPID assay, a molecular test to distinguish sepsis from sterile inflammation, by determining its diagnostic accuracy in critically ill patients who meet criteria for sepsis according to Sepsis-3 definition on ICU admission. Method(s): This is an observational, prospective, and multicenter study. Carried out in seven hospitals in Andalusia (Spain). A 2.5 mL whole blood sample was collected and tested in a SeptiCyte RAPID kit on a real time PCR platform (Idylla™). A score from 0 to 15 (SeptiScore™) was generated that falls into four bands based on the increasing likelihood of infection-positive systemic inflammation. Patients aged 18 years or older, admitted to the ICU with a diagnosis of sepsis were included. Result(s): We enrolled 353 patients, of whom 86 (23.7%) did not present sepsis at the researchers' discretion. SeptiCyte RAPID showed an AUC of [0.84 (CI95% 0.79-0.87)] for differentiating sepsis from sterile systemic inflammation. SeptiCyte RAPID was significantly better for sepsis diagnosis than CRP [0.75 (CI95% 0.70-0.80)] (p =0.003) but without significant differences with PCT [0.80 (CI95% 0.75-0.84)]. SeptiScore distribution in patients with sepsis was higher than patients with sterile inflammation, with a PPV of 68.8% and 92.2% (Bands 3 and 4) for sepsis diagnosis and a PPV of 100% for sterile inflammation (Band 1). Independent risk factors for sepsis were physicians' subjective likelihood of sepsis [intermediate probability OR 4.55 (95% CI 1.61-12.83), p=0.004 and high probability OR 72.04 (95% CI 20.85-248.93), pResult(s): We enrolled 353 patients, of whom 86 (23.7%) did not present sepsis at the researchers' discretion. SeptiCyte RAPID showed an AUC of [0.84 (CI95% 0.79-0.87)] for differentiating sepsis from sterile systemic inflammation. SeptiCyte RAPID was significantly better for sepsis diagnosis than CRP [0.75 (CI95% 0.70-0.80)] (p =0.003) but without significant differences with PCT [0.80 (CI95% 0.75-0.84)]. SeptiScore distribution in patients with sepsis was higher than patients with sterile inflammation, with a PPV of 68.8% and 92.2% (Bands 3 and 4) for sepsis diagnosis and a PPV of 100% for sterile inflammation (Band 1). Independent risk factors for sepsis were physicians' subjective likelihood of sepsis [intermediate probability OR 4.55 (95% CI 1.61-12.83), p=0.004 and high probability OR 72.04 (95% CI 20.85-248.93), pConclusion(s): SeptiCyte RAPID discriminates sepsis from sterile inflammation in critically ill adults, adding value to the diagnosis of sepsis. Copyright © The Author(s) 2026. URL:

4. Vitamin D Status and Sepsis Outcomes: A PRISMA-Compliant Umbrella Review and Meta-Analysis.

Authors: CastroLuna G.;Gomez Galera H.;Sanchez Martinez M. and GongoraBeltran, C.

Publication Date: 2026

Journal: Nutrients 18(5) (pagination), pp. Article Number: 869. Date of Publication: 01 Mar 2026

Abstract: Background: Vitamin D plays an important role in immune regulation, and vitamin D deficiency has been increasingly associated with susceptibility to infection and adverse outcomes in

critically ill patients. Numerous systematic reviews and meta-analyses have examined the relationship between vitamin D status, vitamin D receptor (VDR) gene polymorphisms, and sepsis; however, the evidence remains fragmented. Objective(s): The aim of this work was to synthesize high-level evidence on the association between vitamin D deficiency, VDR gene polymorphisms, vitamin D supplementation, and sepsis-related outcomes through a PRISMA 2020-compliant umbrella review. Method(s): An umbrella review of systematic reviews and meta-analyses published between 2014 and 2025 was conducted using PubMed, PubMed Central, and journal archives. Eligible studies included adult, pediatric, and neonatal populations and evaluated sepsis incidence, mortality, disease severity, secondary outcomes, and genetic associations. Data were synthesized qualitatively due to overlap of primary studies and heterogeneity. Conceptual forest plots and funnel plots were used to summarize evidence direction and potential publication bias. Result(s): Nineteen systematic reviews and meta-analyses encompassing over 300 primary studies were included. Vitamin D deficiency was consistently associated with an increased risk of sepsis, higher mortality, and greater disease severity across adult and pediatric populations. Stronger associations were observed in children and neonates, including higher PRISM III scores, increased need for mechanical ventilation, and longer hospital stays. VDR gene polymorphisms were modestly but consistently associated with increased sepsis susceptibility. In contrast, vitamin D supplementation did not demonstrate a consistent reduction in sepsis risk or mortality. Conclusion(s): Vitamin D deficiency is a robust marker of sepsis risk, severity, and poor prognosis, whereas current evidence does not support vitamin D supplementation as an effective treatment for established sepsis. Copyright © 2026 by the authors. URL:

5. Early albumin infusion and mortality in elderly patients with sepsis based on analysis of the Medical Information Mart for Intensive Care-IV (MIMIC-IV) database.

Authors: Chen J. and Lu, Y.

Publication Date: 2026

Journal: Journal of Zhejiang University: Science B (pagination), pp. Date of Publication: 2026

Abstract: As the impact of early albumin infusion on the prognosis of elderly individuals diagnosed with sepsis remains uncertain, this study aimed to investigate this effect in elderly patients with sepsis in the intensive care unit (ICU). We identified the information of elderly patients with sepsis requiring ICU admission from the Medical Information Mart for Intensive Care-IV (MIMIC-IV) database. They were divided into hypoalbuminemia group and control group, and the primary outcome was 90-d mortality. A multivariate logistic regression model and a multivariate Cox proportional-hazards model were used to analyze the correlation between hypoalbuminemia and patient prognosis. Kaplan-Meier survival curve and log-rank test were performed to analyze the survival outcomes. Propensity score matching (PSM) was implemented to determine the precise effect of early albumin infusion on the prognosis of elderly ICU patients with sepsis, and subgroups of patients were identified to explore the factors influencing the relationship. Early hypoalbuminemia was strongly associated with an increased risk of adverse clinical outcomes in elderly patients with sepsis in the ICU. In-hospital mortality (28.6% vs. 19.1%, PCopyright © Zhejiang University Press 2026. URL

6. Toward precision risk stratification: predicting in-hospital death in sepsis patients with MRSA bacteremia.

Authors: Chen L.;Huang Y. and Zhao, W.

Publication Date: 2026

Journal: BMC Infectious Diseases 26(1) (pagination), pp. Article Number: 463. Date of Publication: 01 Dec 2026

Abstract: Patients with sepsis and concurrent methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infection face a substantial risk of mortality. This study aimed to develop and validate a pragmatic, interpretable prediction model for in-hospital mortality in this high-risk population. We conducted a retrospective, single-center cohort study including 1,605 eligible patients, who were randomly divided into a training set (n = 1,124) and a validation set (n = 481). A rigorous, multi-stage feature selection pipeline-integrating univariate analysis, multi-model machine learning importance assessment, the Boruta algorithm, and stability selection via LASSO-was applied to 64 candidate

variables. This process identified seven parsimonious, clinically accessible predictors: Glasgow Coma Scale score, minimum pH, maximum blood urea nitrogen, minimum white blood cell count, minimum platelet count, maximum lactate level, and the presence of pneumonia. Among six compared machine learning algorithms, logistic regression was selected for its optimal balance of performance and inherent interpretability. The final model demonstrated strong discriminative ability, with an area under the receiver operating characteristic curve (AUC) of 0.861 (95% CI: 0.840-0.882) in the training set and 0.844 (95% CI: 0.811-0.877) in the independent validation set, and showed good calibration (Hosmer-Lemeshow test $p = 0.274$). Decision curve analysis confirmed superior clinical net benefit across a wide range of risk thresholds. The model maintained robust and equitable performance across key patient subgroups and exhibited stability in extensive sensitivity analyses, including multiple imputation and bootstrap internal validation. This interpretable, seven-variable logistic regression model provides a clinically actionable tool for early mortality risk stratification, potentially supporting timely and tailored intervention strategies for sepsis patients with MRSA bacteremia. Copyright © The Author(s) 2026. URL:

7. A Combined Inflammatory-Nutritional Index Model for Early Prognosis Prediction in Sepsis: Evidence From Logistic Regression and Decision Curve Analysis.

Authors: Chen X.;Li K.;Xue S. and Liang, Y.

Publication Date: 2026

Journal: British Journal of Hospital Medicine (London, England : 2005) 87(2), pp. 50658

Abstract: AIMS/BACKGROUND: Sepsis remains a challenging condition with high short-term mortality despite advances in intensive care, emphasizing the significance of early prognostic assessment in guiding treatment decisions. Inflammatory and nutritional-immune indices are well-established predictors of clinical outcomes in critically ill patients. This study aims to evaluate the prognostic significance of the systemic immune-inflammation index (SII) and the Naples Prognostic Score (NPS) in predicting 28-day survival outcomes among individuals diagnosed with sepsis. The study also aims to construct and assess a visual predictive tool-specifically, a nomogram-that incorporates both of these biomarkers. METHOD(S): This retrospective study analyzed clinical data recorded from patients with sepsis who were treated in the intensive care unit (ICU) of The People's Hospital of Cangnan between January 2021 and December 2023. Applying pre-determined inclusion-exclusion criteria, 324 cases were ultimately included in the final analysis. Comprehensive baseline data, including clinical features and laboratory findings, were systematically retrieved from the electronic health record system. Mortality-associated markers were identified within 28 days using univariate analyses followed by multivariable logistic regression, with SII included as a continuous variable and NPS as a categorical variable. The predictive performance of SII and NPS, both individual and in combination, was assessed using receiver operating characteristic (ROC) curve. A predictive nomogram was developed, and the accuracy and clinical utility of the model were then evaluated using calibration plots and decision curve analysis (DCA). RESULT(S): The analysis revealed that higher SII values ($p = 2$, $p = 2$, $p = 2$, $p = 2$, $p = 2$). CONCLUSION(S): SII and NPS are robust and independent predictors of short-term mortality in sepsis. The nomogram developed from these indicators offers a practical, data-driven approach to individualized risk prediction. This study highlights the clinical utility of integrating inflammatory and nutritional-immune indices in prognostic evaluation. © Copyright: © 2026 The Author(s). Published by IMR Press. URL

8. An artificial intelligence-powered learning health system to improve sepsis detection and quality of care: a before-and-after study.

Authors: Despraz J.;Matusiak R.;Nektarijevic S.;Rossetti V.;Bastardot F.;Akrou R.;Konasch A.;Gauthiez E.;Pignolet O.;Pepe S.;Chiche J.D.;Kaufmann D.E.;Calandra T.;Raisaro J.L.;Meylan S.;RothKleiner M.;Lehn I.;Junger A.;GallandDecker C.;Vingerhoets S., et al

Publication Date: 2026

Journal: Npj Digital Medicine 9(1) (pagination), pp. Article Number: 106. Date of Publication: 01 Dec 2026

Abstract: Sepsis is a major global health crisis where early recognition and effective management remain significant challenges for healthcare systems. As part of the Lausanne University Hospital sepsis quality of care program, we developed and validated an Artificial Intelligence (AI)-powered Sepsis Learning Health System (SLHS) to enhance sepsis care. The SLHS combines a standardized clinical pathway with HERACLES, an AI algorithm that retrospectively classifies patient data into confirmed, possible, or invalidated sepsis cases every 6 h. Predictions inform dynamic dashboards displaying quality-of-care indicators to guide clinical interventions. Analysis of 97,559 stays in wards using the SLHS and 25,851 stays in control wards showed that in-hospital and 90-day mortality decreased for HERACLES-flagged sepsis in SLHS wards, while control wards did not. Further, sepsis coding increased in SLHS wards but did not change in control wards. This real-world example demonstrates how clinician-integrated AI systems can improve sepsis detection and outcomes. Copyright © The Author(s) 2026. URL:

9. In-hospital survival characteristics and predictive model for patients with malignant tumors and sepsis.

Authors: Gan, Ziyang; Zhang, Jiahao; Huang, Jinpeng; Long, Shunqin; Wu, Wanyin; Wang, Guo; Yao, Xiaobin; Li, Qiang; Yang, Xiaobin and Li, Yonglin

Publication Date: 2026

Journal: Frontiers in Medicine 13, pp. 1751311

Abstract: Objectives: To investigate the factors associated with in-hospital survival prognosis in participants with malignant tumors complicated by sepsis and to develop a predictive model. Methods: A retrospective study was conducted to collect data from 2,152 participants with malignant tumors complicated by sepsis, hospitalized at Guangdong Provincial Hospital of Chinese Medicine between January 2014 and June 2024. Univariate and multivariable logistic regression analyses were performed to identify independent risk factors, and the ADASYN oversampling technique was applied to address class imbalance. The dataset was randomly split into training and testing sets at an 8:2 ratio. Key features were selected using the recursive feature elimination (RFE) method, and eight machine learning models (logistic regression, decision tree, random forest, K-nearest neighbors, support vector machine, naive Bayes, stochastic gradient boosting, and neural network) were evaluated and hyperparameter-optimized. Results: A total of 2,152 participants were included in the study, with an in-hospital mortality rate of 12.6%. Multivariable analysis indicated that age, SOFA score, coagulation dysfunction, and metabolic abnormalities were important prognostic risk factors. The random forest model showed excellent discriminative ability on the validation set, with an AUC of 0.95, sensitivity of 91%, and specificity of 85%. A total of 10 features with the highest predictive value were selected using the RFE method, including troponin T, platelet distribution width, neutrophil count, red blood cell distribution width, fibrinogen, prothrombin time activity, aspartate transaminase, urea, low-density lipoprotein cholesterol, and creatinine. Conclusion: Age, SOFA score, coagulation dysfunction, and metabolic abnormalities are important prognostic risk factors for participants with malignant tumors complicated by sepsis. The random forest model constructed based on these key features has good predictive performance and can provide a powerful tool for the prognosis assessment of participants with malignant tumors complicated by sepsis. Future research needs to further validate the applicability and practical value of the model in different populations. Copyright © 2026 Gan, Zhang, Huang, Long, Wu, Wang, Yao, Li, Yang and Li. URL

10. Dynamic changes and prognostic utility of procalcitonin, D-dimer, and lactate dehydrogenase in patients with sepsis and septic shock.

Authors: Ge, Qiuxia; Song, Weijuan; Ding, Hongmei; Wu, Haojie and Ren, Zhen

Publication Date: 2026

Journal: Frontiers in Medicine 13, pp. 1771448

Abstract: Objective: To investigate whether serum levels of procalcitonin (PCT), D-dimer (D-D), and lactate dehydrogenase (LDH) are associated with disease severity and differ between patients with sepsis with favorable versus poor in-hospital outcomes. Methods: This retrospective cohort study included 171 patients with sepsis. Patients were stratified into a septic shock group (n=49) and a non-

shock sepsis group (n=122) to assess disease severity and further categorized into an improved group (n=127) and a poor prognosis group (n=44) based on discharge outcomes to evaluate prognostic value. Univariate and multivariate logistic regression analyses were performed to identify independent factors associated with septic shock. Dynamic trajectories of PCT, D-D, and LDH levels during hospitalization were also analyzed. Results: On admission, levels of PCT, D-D, and LDH were significantly higher in the septic shock group than in the non-shock sepsis group (all $p < 0.01$). In the multivariable model, elevated levels of PCT (OR=1.015, 95% CI: 1.002-1.028), D-D (OR=1.087, 95% CI: 1.010-1.170), and LDH (OR=1.265, 95% CI: 1.016-1.576) were independently associated with an increased likelihood of septic shock. Patients with a poor prognosis exhibited persistently elevated levels of all three biomarkers throughout hospitalization, whereas these levels decreased significantly in the improved group. Conclusion: PCT, D-D, and LDH are valuable biomarkers for stratifying disease severity and predicting clinical outcomes in patients with sepsis. Admission levels of these biomarkers were independently associated with the development of septic shock, and their dynamic changes provided additional prognostic information. Copyright © 2026 Ge, Song, Ding, Wu and Ren. URL:

11. Digital alerting to improve sepsis detection and patient outcomes in NHS Trusts: a multi-methods study.

Authors: Honeyford K.;Cooke G.;Kinderler A.;Welch J.;Brent A.;Glampson B.;TonkinCrine S.;Lazzarino R.;Patil S.;Ghazal P.;Goodman P.;Daniels R.;Gordon A. and Costelloe, C.

Publication Date: 2026

Journal: Health and Social Care Delivery Research 14(5), pp. 1–23

Abstract: Background: Identifying clinical deterioration is a global health priority. Sepsis is a leading cause of deterioration, responsible for around 46,000 deaths annually in the United Kingdom. Early warning scores based on patients' vital signs can be embedded into electronic patient records to digitally alert clinicians to those at risk. Rapid identification and treatment-particularly with targeted intravenous antibiotics-are critical to improving outcomes in sepsis patients. Research question: This study aimed to evaluate the effectiveness of digital alerts in improving outcomes for patients with sepsis. Using routine electronic patient record data from four United Kingdom National Health Service acute trusts, we investigated how digital alert systems influence patient outcomes and explored mechanisms and mediators of their effectiveness. Objective(s): Map the types of digital alerts currently in use across United Kingdom hospitals for identifying patients at risk of sepsis (Workstream 1). Evaluate the impact of digital alerts on patient outcomes (Workstream 2). Examine how the implementation process affects alert performance, guided by the consolidated framework for implementation research (Workstream 3). Provide recommendations on alert effectiveness and implementation strategies using systems modelling and mediation analysis (Workstream 4). Method(s): A mixed-methods approach was employed. A national survey assessed the use of digital sepsis alerts in English National Health Service hospitals (Workstream 1). Qualitative interviews and focus groups explored the implementation process and its influence on alert performance (Workstream 3). A natural experiment with multilevel interrupted time series analysis examined the impact of sepsis screening tools and digital alerts on outcomes, primarily in-hospital mortality (Workstream 2). Routinely collected clinical data were processed following National Institute for Health Research-Health Information Collaborative standards. Combining quantitative and qualitative data enabled us to link implementation processes with patient outcomes. Result(s): All four trusts experienced reduced mortality rates among patients with serious infections following the introduction of digital sepsis screening tools. After adjustment for patient case-mix, admission patterns and pre-existing trends, one trust showed a statistically significant decrease in mortality linked to digital alert implementation. In two trusts, older patients experienced greater mortality reduction than younger ones following alert introduction. Qualitative findings highlighted factors contributing to more effective use of digital alerts: deployment in general wards rather than intensive care units; use by clinicians familiar with similar technologies; availability of 24/7 emergency outreach teams; robust technological infrastructure and alerts that were user-friendly, non-intrusive and not part of multiple competing alert systems. Conclusion(s): The effectiveness of digital sepsis screening tools varies and may depend on patient's age and care setting. Our findings suggest that digital alerts should leverage a wider range of electronic patient record data and be tailored to specific patient groups. Different trusts and patient populations may require distinct indicators, thresholds and treatment protocols. These findings align with healthcare practitioners' calls

for more sophisticated, patient-centred sepsis screening tools targeted at relevant clinical teams. Future work and limitations: The study involved four National Health Service Trusts with strong data collaboration, but noted limitations include reliance on simple algorithms and varied case-mix and implementation processes. Future research should focus on robust evaluation methods, leveraging granular electronic patient record data and establishing a public registry of digital alert tools. Funding(s): This synopsis presents independent research funded by the National Institute for Health and Care Research (NIHR) Health and Social Care Delivery Research programme as award number NIHR129082. URL

12. Association of antibiotic type and timing with sepsis mortality using target trial emulation.

Authors: Li J.;Zhao M. and He, Q.

Publication Date: 2026

Journal: Scientific Reports (pagination), pp. Date of Publication: 25 Feb 2026

Abstract: Antibiotic therapy is essential for sepsis management, but the optimal empirical strategy remains uncertain. This study evaluated the effects of first-line antibiotic preference and initiation timing on in-hospital mortality among intensive care units (ICU) patients with sepsis. Using the MIMIC-IV database, we emulated a sequential target trial comparing patients who received antibiotics within 48 h of sepsis diagnosis versus delayed initiation. Randomization was approximated through a clone-censor-weight process to address confounding by indication. The primary outcome was in-hospital mortality. Weighted Cox regression estimated hazard ratios (HRs), and sensitivity analyses tested robustness. Among 3,669 eligible patients, 3,568 (97%) received antibiotics within 48 h. After weighting, covariate balance was achieved. Beta-lactam use was associated with lower in-hospital mortality (HR 0.88, 95% CI 0.78-0.95), with consistent reductions at 7, 14, and 60 days. Timing within the 48-hour window did not modify outcomes for either beta-lactams or glycopeptides. Empirical beta-lactam therapy was linked to improved survival among ICU sepsis patients, whereas timing of initiation showed no significant impact. These findings support prioritizing beta-lactam-based regimens as first-line empirical coverage in early sepsis management. Copyright © 2026. The Author(s). URL:

13. The predictive value of the dynamic change slope of red blood cell distribution width to platelet ratio combined with clinical indicators for the mortality outcome of patients with sepsis.

Authors: Li, Mingjuan;Lu, Zhonghua;Cao, Lijun and Sun, Yun

Publication Date: 2026

Journal: PLoS ONE [Electronic Resource] 21(3), pp. e0343684

Abstract: This retrospective study investigated the predictive value of the dynamic slope of the red blood cell distribution width to platelet ratio (RPR) for in-hospital mortality in patients with sepsis admitted to the intensive care unit (ICU). A total of 154 patients with sepsis admitted to the ICU of the Second Affiliated Hospital of Anhui Medical University between August 2023 and August 2024 were included and classified into non-survivors (n = 37) and survivors (n = 117) according to in-hospital outcome. Red blood cell distribution width (RDW) and platelet count (PLT) were recorded on days 1-5 after ICU admission, and RPR was calculated as RDW/PLT. Generalized estimating equations demonstrated significant differences in RPR between groups and over time, with a significant group-time interaction, indicating distinct temporal trends between survivors and non-survivors. The RPR in the survivors increased initially and then declined, whereas the RPR in the non-survivors showed a continuous upward trend. Receiver operating characteristic analysis showed that the slope of RPR change had good predictive performance for in-hospital mortality, with an area under the curve of 0.863 (95% CI 0.781-0.946). Optimal cutoff value of 0.017 yielded sensitivity of 86.5% and specificity of 83.8%. Multivariate logistic regression analysis identified high RPR slope (OR = 5.665, 95% CI 1.453-22.084), lactate level, Sequential Organ Failure Assessment (SOFA) score, and mechanical ventilation time as independent risk factors for in-hospital mortality. Furthermore, the combined model incorporating RPR slope, SOFA score, lactate, and mechanical ventilation time showed excellent predictive ability, with an area under the curve of 0.954 (95% CI 0.924-0.983). These findings suggest that dynamic monitoring of RPR provides valuable prognostic information and may improve early risk stratification in patients with sepsis. Copyright: © 2026 Li et al. This is an open access article

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14. Antibiotic timing and progression to sepsis among patients in the ED for infection.

Authors: Lin X.;Liu C.;Chen F.;Xie H.;Xie A.;Wang L.;Chen C.;Wang Z.;Weng J. and Chen, Y.

Publication Date: 2026

Journal: European Journal of Medical Research 31(1) (pagination), pp. Article Number: 389. Date of Publication: 01 Dec 2026

Abstract: Background: Timely administration of antibiotics is critical in the management of infectious diseases, particularly in preventing progression to sepsis. Despite the urgency, the appropriate timing of antibiotic treatment, especially in non-septic infections, remains unclear. This study aimed to assess the association between antibiotic timing and progression to sepsis among patients admitted to the Emergency Department (ED) for suspected infection. Method(s): A retrospective cohort study utilized data from three tertiary-care hospital EDs between January 2021 and June 2023. Adult patients hospitalized for clinical infection were included. The primary outcome was sepsis development, while secondary outcomes included hospital mortality, Intensive Care Unit (ICU) admission, ICU length of stay (LOS), and hospital LOS. The main exposure was the duration from ED arrival to initial antibiotic administration. Multivariable logistic and negative binomial regression were employed to adjust for confounders and assess associations. Result(s): The study included 1279 infected adult patients, with 20.5% developing sepsis and 10.3% admitted to the ICU, resulting in 3.8% in-hospital deaths. The median time from ED arrival to initial antibiotic administration was 123 min (interquartile range(IQR), 79-241 min). Although per-hour delays in antibiotic administration showed association with sepsis development (Adjusted Odds Ratio(aOR) (95% CI) 1.071(1.044-1.099); P Result(s): The study included 1279 infected adult patients, with 20.5% developing sepsis and 10.3% admitted to the ICU, resulting in 3.8% in-hospital deaths. The median time from ED arrival to initial antibiotic administration was 123 min (interquartile range(IQR), 79-241 min). Although per-hour delays in antibiotic administration showed association with sepsis development (Adjusted Odds Ratio(aOR) (95% CI) 1.071(1.044-1.099); P Result(s): The study included 1279 infected adult patients, with 20.5% developing sepsis and 10.3% admitted to the ICU, resulting in 3.8% in-hospital deaths. The median time from ED arrival to initial antibiotic administration was 123 min (interquartile range(IQR), 79-241 min). Although per-hour delays in antibiotic administration showed association with sepsis development (Adjusted Odds Ratio(aOR) (95% CI) 1.071(1.044-1.099); P Conclusion(s): These hypothesis-generating findings suggest that, in non-severe infections, delays within 12 h might not be associated with significantly increased risks, potentially allowing time for diagnostic clarification without apparent harm. However, due to the observational nature of the study and potential biases, prospective studies are required to confirm these associations. Copyright © The Author(s) 2026. URL:

15. The virtual home hospital septic stone discharge pathway: results following implementation at a single Canadian centre.

Authors: Mancuso M.;Pattar S.;Albers P.;Jacka M. and Hoy, N.

Publication Date: 2026

Journal: SSRN (pagination), pp. Date of Publication: 27 Feb 2026

Abstract: Introduction Traditionally, patients with septic stones (SS) remain hospitalized until clinically stable and culture-directed oral antibiotic therapy can be initiated, leading to a prolonged hospital stay after source control. A novel Virtual Home Hospital (VHH) pathway was introduced to enable early discharge with physician oversight including lab work, and home-based IV antibiotics pending rationalization. Objective To assess for length of hospital stay (LOS). Secondary objectives included representation rates, and other complications. Methods 137 SS patients were retrospectively analyzed at our institution, of which 37 were enrolled in the VHH pathway. Collected data included demographics, clinical course details, blood culture results, admission timelines, and unplanned healthcare visits. Results No demographic differences were noted between groups. ICU admission occurred in more non-VHH patients compared to VHH patients (17% vs 3%, p=0.03). Significantly more positive blood

cultures were noted in the non-VHH group (49% vs 24%, $p=0.009$). Mean LOS was significantly shorter in the VHH group (3.8 vs. 2.3 days, $p=0.005$). Mean antibiotic duration was shorter in the VHH group (12.3 vs 10.2 days, p Copyright © 2026, The Authors. All rights reserved. URL:

16. MEAN PLATELET VOLUME AND IT'S CORRELATION WITH SOFA SCORE FOR DETERMINING SEVERITY AND PROGNOSIS IN SEPSIS.

Authors: Marangmei L.;Barman S.;Premita M.;Pukhrambam G.D.;Devi S.L.;Akuli S.P.;Kumar B.J. and Kharjana, A.

Publication Date: 2026

Journal: International Journal of Academic Medicine and Pharmacy 8(1), pp. 879–886

Abstract: Background: Sepsis is a major cause of morbidity and mortality, and early assessment of disease severity is essential for improving outcomes. Mean platelet volume (MPV), a routinely available haematological parameter, reflects platelet activation and systemic inflammatory response and may have prognostic significance in sepsis. Material(s) and Method(s): This hospital based prospective longitudinal study was conducted in a tertiary care teaching hospital and included 147 adult patients diagnosed with sepsis. Clinical findings, laboratory parameters including mean platelet volume (MPV) and Sequential Organ Failure Assessment (SOFA) scores were recorded at admission and 72 hours after admission. The correlation between MPV and SOFA score was analysed using Pearson correlation. Paired t-test was used to compare changes in SOFA score and MPV from admission value to 72 hours of admission. A p-value of less than 0.05 was considered statistically significant. Result(s): The mean SOFA score at the time of admission was 6.30 +/-2.83 and the mean MPV was 8.71 +/-0.70. MPV showed a strong positive correlation with SOFA score ($r=0.710$, $p=0.01$). After 72 hours of admission, the mean SOFA score (8.69 +/-4.89), and the mean MPV (9.08 +/-0.91) increased as compared to admission value, p value Result(s): The mean SOFA score at the time of admission was 6.30 +/-2.83 and the mean MPV was 8.71 +/-0.70. MPV showed a strong positive correlation with SOFA score ($r=0.710$, $p=0.01$). After 72 hours of admission, the mean SOFA score (8.69 +/-4.89), and the mean MPV (9.08 +/-0.91) increased as compared to admission value, p value Conclusion(s): Mean platelet volume demonstrates a significant positive correlation with SOFA score in patients with sepsis. MPV, being a simple, inexpensive and readily available laboratory parameter, may serve as a useful adjunct marker for addressing severity and prognosis in sepsis. Copyright © (2026), (Society for Healthcare and Research Development). All rights reserved. URL:

17. Prognostic value of the triglyceride-glucose index for ICU mortality in non-diabetic sepsis: a restricted cubic spline analysis.

Authors: Min, Ming;Gui, Dan;Gong, Lijun;Liu, Qianfei;Luo, Yaomei;Cao, Yanli and Liu, Peijun

Publication Date: 2026

Journal: Frontiers in Endocrinology 17, pp. 1752068

Abstract:

Background: The triglyceride-glucose (TyG) index has been identified as a metabolic marker associated with adverse outcomes in sepsis, but its prognostic value in non-diabetic septic patients remains unclear. **Objective:** To assess the association between TyG levels and ICU mortality in non-diabetic sepsis and validate the findings in an external cohort. **Methods:** A retrospective analysis of 2,217 non-diabetic sepsis patients from the MIMIC-IV database was conducted using multivariate logistic regression, threshold effect analysis, restricted cubic spline (RCS) modeling, and subgroup analyses. External validation was performed in an independent ICU cohort of 185 non-diabetic sepsis patients from The Central Hospital of Enshi, stratified by the MIMIC-derived TyG cut-off of 9.163. **Results:** ICU mortality in the MIMIC cohort was 12.2%. Compared with Q2, Q4 showed a significantly increased mortality risk (OR = 1.49, 95% CI: 1.12-1.97, $P = 0.006$). RCS analysis demonstrated a significant U-shaped association with a threshold at TyG = 9.163. Subgroup analyses confirmed consistent trends. In the external validation cohort, mortality was higher in the high-TyG group than in the low-TyG group (29.0% vs. 21.7%), showing a directionally consistent, though non-significant, trend ($P = 0.23$). **Conclusion:** The TyG index is independently associated with ICU mortality in non-diabetic sepsis and exhibits a clear U-shaped pattern. The external validation cohort demonstrated a similar risk

trend, supporting the broader applicability of TyG as a simple metabolic marker for risk stratification. Copyright © 2026 Min, Gui, Gong, Liu, Luo, Cao and Liu. URL:

18. Prognostic Nutritional Index (PNI) in Patients With Diabetes and Sepsis: A Cross-Sectional Study.

Authors: Patro, Shubhransu;Pattnaik, Sidharth S.;Arora, Parmarth;Choudhary, Arushi;Sharma, Vibha;Naik, Prithviraj U.;Arora, Mayank and Pandit, Simoni B.

Publication Date: Feb ,2026

Journal: Cureus 18(2), pp. e104004

Abstract: BACKGROUND AND OBJECTIVES: Sepsis and multiorgan dysfunction syndrome (MODS) are serious global health concerns. Patients with critical illnesses are assessed using the sequential organ failure assessment (SOFA) score for morbidity. The prognostic nutritional index (PNI) is a novel composite biomarker for sepsis. It is based on two parameters: absolute lymphocyte count and serum albumin. The purpose of this study was to examine PNI in patients with diabetes and sepsis. Additionally, we correlated the SOFA score and PNI of the study participants at admission. METHODS: This cross-sectional study was carried out from August 2025 to December 2025 at the Kalinga Institute of Medical Sciences (KIMS), Bhubaneswar, India. Adult diabetes patients of both sexes fulfilling Sepsis-3 criteria were included in this study. We recorded their absolute lymphocyte count and serum albumin for PNI calculation. SOFA scores were noted at day 1, 3, and 7. The categorical and continuous variables were assessed with the Chi-square and the Wilcoxon test, respectively. We used the Spearman correlation to assess the association between the SOFA score at day 1 and the subjects' PNI values. R software (version 4.3.2) was used for data analysis. RESULTS: A total of 557 patients were assessed in this study. Their median age was 59.0 (52.0-65.0) years. Of the participants, 335 (60.14%) were male. The average hospital stay was 12.0 (9.0-16.0) days. MODS was recorded in 459 (82.41%) patients. The median serum albumin and absolute lymphocyte count of the study population were 2.80 (2.40-3.20) g/dL and 1.13 (0.69-1.88) x 10⁹/L, respectively. The median PNI of the subjects was 34.64 (interquartile range (IQR), 30.32-39.39). The median SOFA score during admission was 5.0 (IQR, 3.0-8.0). There was a negative correlation between SOFA score at day 1 and PNI (-0.153, 95% CI:-0.233 to-0.071, p /L, respectively). The median PNI of the subjects was 34.64 (interquartile range (IQR), 30.32-39.39). The median SOFA score during admission was 5.0 (IQR, 3.0-8.0). There was a negative correlation between SOFA score at day 1 and PNI (-0.153, 95% CI:-0.233 to-0.071, p CONCLUSION: Male and female subjects with sepsis had comparable PNI values. However, serum albumin, absolute lymphocyte count, and SOFA scores showed statistically significant differences between genders. The PNI and SOFA scores were negatively correlated. The majority of the subgroup analyses also showed weakly negative associations. However, the study findings cannot be generalized due to a single-centric design, a small sample size, and missing data on hemodynamic, renal, hepatic, and glycemic parameters, antibiotics used, daily fluid intake, urine output, comorbidities, and concomitant medications. Copyright © 2026, Patro et al. URL:

19. Risk Factors for Adverse Outcomes in Cancer Patients With Sepsis.

Authors: Pope, Christopher;Ahwin, Priscilla;Kota, Nikhil;Palathingal, Ann;Peng, Jason;Suresh, Harshini;Thampi, Subhadra;Hunter, Krystal and Roy, Satyajeet

Publication Date: Feb ,2026

Journal: Journal of Clinical Medicine Research 18(2), pp. 63–74

Abstract: Background: Cancer and its various treatment modalities increase susceptibility to the development of sepsis. Because of the complex relationship between sepsis and cancer, we aimed to study the differences in risk factors and outcomes of sepsis in patients with cancer (SCa) compared to patients without cancer (SnoCa). Methods: A retrospective cohort analysis of all adult patients who received care for sepsis in an urban tertiary healthcare center was conducted. Risk factors and outcomes were compared between the SCa and SnoCa groups. Results: SCa group (n = 310) was older than SnoCa group (n = 628) (66.8 vs. 61.5 years; P : SCa group (n = 310) was older than SnoCa group (n = 628) (66.8 vs. 61.5 years; P 2; P = 0.01), and history of transient ischemic attack (TIA)

(6.1% vs. 2.7%; P = 0.01). Conversely, there were lower associations of recreational drug use (10.0% vs. 17.0%; P = 0.01) and diabetes mellitus (DM) (35.9% vs. 45.9%; P = 0.01). Simple linear regression found that the SCa group had lower length of stay (LOS) (beta = -0.08; P = 0.03). Logistic regression model showed that having cancer increased odds of all-cause mortality (odds ratio (OR) 1.82, 95% confidence interval (CI) 1.35-2.46; P = 0.01), and history of transient ischemic attack (TIA) (6.1% vs. 2.7%; P = 0.01). Conversely, there were lower associations of recreational drug use (10.0% vs. 17.0%; P = 0.01) and diabetes mellitus (DM) (35.9% vs. 45.9%; P = 0.01). Simple linear regression found that the SCa group had lower length of stay (LOS) (beta = -0.08; P = 0.03). Logistic regression model showed that having cancer increased odds of all-cause mortality (odds ratio (OR) 1.82, 95% confidence interval (CI) 1.35-2.46; P = 0.01). Conclusion: Compared to patients with sepsis without cancer, patients with sepsis and cancer have higher association with older age, male sex, White race, lower BMI, and TIA, and lower association with recreational drug use and DM. Patients with sepsis and cancer have lower LOS, higher all-cause mortality and have no difference in readmissions, bloodstream infections, and in-hospital mortality. Copyright 2026 Authors. URL:

20. Timely antibiotics and fluid resuscitation are associated with increased discharge to home after sepsis.

Authors: Prescott H.C.;Weinstein J.;Seelye S.;Buxbaum J.D.;Bernstein S.J.;Cahill M.;Heath M.;Hsaiky L.;Horowitz J.K.;Jayaprakash N.;Malani A.N.;McLaughlin E.;Swaminathan L.;Posa P.J.;Flanders S.A. and Ryan, A. M.

Publication Date: 2026

Journal: Chest (pagination), pp. Date of Publication: 13 Mar 2026

Abstract: BACKGROUND: Sepsis is a devastating condition with frequent discharge to non-home settings such as skilled nursing facilities. Bundled payment incentive programs targeting sepsis have tried to encourage lower spending by avoiding discharge to institutional post-acute care. QUESTIONS: What is the impact of timely antibiotic delivery and fluid resuscitation on discharge to home after sepsis? STUDY DESIGN AND METHODS: Observational cohort study of adults hospitalized for confirmed community-onset sepsis at 67 hospitals participating in Michigan Hospital Medicine Safety Consortium's sepsis initiative (HMS-Sepsis) during 2022-2025. Timely antibiotic delivery and fluid resuscitation were assessed via performance measures used for statewide benchmarking. Antibiotic delivery was measured in patients without positive viral testing. Target administration was =30ml/kg body weight) was measured in patients with hypotension or elevated lactate. The primary outcome was discharge to home. RESULT(S): Among 38,568 patients with community-onset sepsis (18,941 male [49.1%]; median age 71 years [Q1-Q3: 61-80 years], 7,942 (20.6%) died in hospital or were discharged to hospice; 9,941 (25.8%) were discharged to a post-acute care facility; and 20,685 (53.6%) were discharged to home. Among 35,025 and 27,393 eligible patients, timely antibiotic delivery and fluid resuscitation occurred in 26,357 (75.3%) and 13,561 (49.5%), respectively. In multivariable models adjusted for patient characteristics, timely antibiotic administration and fluid resuscitation were associated with a 3.0 (95% CI: 2.0-4.0) and 1.1 (95% CI 0.2-2.1) absolute percentage point increase in discharge to home, respectively. Findings were robust across sensitivity and subgroup analyses. INTERPRETATION: In this multihospital cohort, timely antibiotic delivery and fluid resuscitation were associated with increased discharge to home after sepsis. This finding suggests that timely treatment of sepsis may reduce downstream morbidity and healthcare expenditures. Copyright © 2026. Published by Elsevier Inc. URL:

21. The Joint Effect of Stress Hyperglycemia Ratio and Inflammatory Burden Exacerbates Mortality Risk and Prolongs ICU Stay in Sepsis: A Combined Analysis.

Authors: Qu, Xiaoxue;Yang, Yan;Xu, Tuo and Liu, Dezhi

Publication Date: 2026

Journal: Infection & Drug Resistance 19, pp. 572812

Abstract: Background: Previous studies have shown that stress-induced increases in blood sugar and inflammation are closely associated with the mortality risk in sepsis patients. The stress hyperglycemia ratio (SHR) and the aggregate index of systemic inflammation (AIS) are commonly used as key

indicators to assess stress-induced blood glucose levels and inflammatory load. However, the relationship between these two factors and adverse outcomes in sepsis patients remains unclear. **Methods:** This study adopted a retrospective cohort study design, selecting 1509 patients with sepsis from a self-registered cohort and the MIMIC-IV database. Cox regression analyzed associations between SHR, AISI, their interaction, and mortality. Cumulative risk curves evaluated mortality across groups, and the C-index assessed predictive performance of the combined metric. We also compared hospitalization and ICU stay durations among groups. **Results:** The Cox regression analysis showed that both elevated SHR and AISI were strongly associated with an increased risk of death in sepsis patients, and their combination further amplified this risk. Specifically, the high SHR and high AISI groups had significantly higher mortality compared to the low SHR and low AISI groups. Additionally, the combined effect of SHR and AISI achieved a C-index of 0.7 for overall mortality, demonstrating a stronger predictive ability. The ICU stay duration was also significantly longer in the high SHR and high AISI groups. **Conclusion:** The combined effects of SHR and AISI are strongly correlated with increased mortality and prolonged ICU stays in sepsis patients. Early control of stress glucose levels and inflammation may not only reduce death risk but also shorten ICU stays, aiding precision medicine and potentially reducing economic burden. Copyright © 2026 Qu et al. URL

22. Efficacy and Safety of Procalcitonin-guided Antibiotic Therapy versus Standard of Care for Sepsis: A Systematic Review and Meta-analysis.

Authors: Raja H.A.A.; Afridi M.J.; Asad F.; Yasin K.; Uzair M.; Saleem Y.; Sardar H.; Bismil I.; Saeed A.; Ullah I.; Riffat G.; Khan M.H.A.; Khan H.; Rehman M.E.U. and Ali, F.

Publication Date: 2026

Journal: Medical Principles and Practice : International Journal of the Kuwait University, Health Science Centre , pp. 1–17

Abstract: **OBJECTIVES:** This systematic review and meta-analysis assesses the efficacy and safety of procalcitonin (PCT) guided therapy compared to standard of care (SOC) in septic patients. **METHOD(S):** A comprehensive literature search was performed using the Cochrane Library, ClinicalTrials.gov, Embase, and MEDLINE, covering studies from their inception to April 2025. RevMan was used to perform a random-effects meta-analysis, and forest plots were used to visualize the pooled estimates. The Mantel-Haenszel method was applied to analyze dichotomous outcomes. The inverse variance method was applied to analyze continuous outcomes. **RESULT(S):** Sixteen randomized controlled trials (RCTs), with a total of 6,885 patients, were included. PCT-guided therapy was associated with significantly improved antibiotic treatment duration (standardized mean difference [SMD]-0.81, 95% CI-1.17 to-0.45, I² 97%), duration of mechanical ventilation (SMD-0.47, 95%CI-0.57 to-0.37, I² 0%) and antibiotic-free days (SMD 0.14, 95% CI 0.04-0.25, I² 0%). Both groups were comparable in terms of ICU mortality, hospital mortality, 30-day mortality, 90-day mortality, ICU stay, hospital stay, new infection and clinical recovery. PCT was associated with greater reinfection (RR 1.12, 95% CI 1.00-1.26, I² 0%). **CONCLUSION(S):** PCT-guided therapy was associated with shorter antibiotic treatment duration, though substantial heterogeneity was observed, while mortality outcomes were comparable between groups. Standardized PCT-based protocols are needed to improve consistency and clinical applicability. Copyright The Author(s). Published by S. Karger AG, Basel. URL:

23. Impact of cardiovascular and metabolic comorbidities on severity and outcomes of hospital-acquired sepsis in intensive care patients: a case-control study.

Authors: Roy A.; Krishnasamy V.; Mitra S.; Banerjee S.; Dutta T.K.; Kumar N.S. and Roy, S.

Publication Date: 2026

Journal: BMC Infectious Diseases 26(1) (pagination), pp. Article Number: 474. Date of Publication: 01 Dec 2026

Abstract: **Background:** Sepsis is a life-threatening dysregulated host response to microbial infection often leading to multiorgan failure and cardiovascular complications, which significantly contribute to mortality. This study aimed to identify key risk factors associated with disease severity among sepsis patients with distinct cardiovascular and metabolic comorbidities. **Method(s):** This hospital-based case-control study included 148 adult patients with sepsis admitted to the intensive care unit (ICU) and 311 non-septic controls with comparable cardiovascular and metabolic comorbidities. Sepsis was

diagnosed based on clinical criteria and confirmed by elevated serum procalcitonin levels. Serum procalcitonin, IL-6, IL-10, and TNF-alpha were measured using chemiluminescent immunoassays. Associations between comorbidities and sepsis severity were evaluated using chi-square tests and logistic regression and survival among sepsis cases was explored using Kaplan-Meier analysis. Result(s): Mostly infections were caused by Gram-negative bacteria, mainly *Klebsiella pneumoniae* and *Escherichia coli*. Elevated serum procalcitonin levels were used to support the diagnosis of sepsis. Compared with controls, sepsis patients showed significant increases in serum levels of IL-6, IL-10 and TNF-alpha, indicating an enhanced systemic inflammatory response. Statistical analysis showed that cardiovascular diseases, hypertension and type-2 diabetes were significantly associated with increased disease severity. Descriptive survival analyses among sepsis patients suggested lower survival probabilities in those with rheumatic heart disease and peripheral arterial disease. Conclusion(s): Cardiovascular and metabolic comorbidities particularly myocardial infarction and type 2 diabetes mellitus are strongly associated with sepsis requiring intensive care. Elevated inflammatory cytokine levels characterize the systemic immune response in these patients. These findings highlight the importance of early risk stratification in septic patients with underlying cardiometabolic disease. Copyright © The Author(s) 2026. URL:

24. The Prevalence of Infection and Sepsis Associated Dysphagia in Hospitalised Patients: A Retrospective Cross-sectional Study.

Authors: Sasegbon A.; Bastawisy K.; Cheng I. and Hamdy, S.

Publication Date: 2026

Journal: Dysphagia (pagination), pp. Date of Publication: 2026

Abstract: Little is known about the relationships between infections, sepsis and dysphagia. In this study, we aimed to assess the prevalence and factors associated with dysphagia in patients admitted to hospital with infections or sepsis. Participants ≥ 18 years admitted to hospital with infections or sepsis caused by pneumonia, urine tract infections or cholecystitis were recruited from an NHS Trust in the UK. Electronic patient record and clinical coding staff screened patient data from 01/02/2022 to 01/02/2023. Patients with previous dysphagia, acute head injuries or stroke were excluded. Those that remained had data extracted from their notes, including age, gender, length of stay (LOS), co-morbidities, and mortality. Data was then analysed using statistical tests, including Logistic regression. Over the study period, 4475 patients (M:2031, F:2444) were admitted with infections (Pneumonia 2465, UTI 1888 and Cholecystitis 401). Of these, 189 (4.2%) developed dysphagia during their inpatient stay (Pneumonia 6.0%, UTI 3.5%, Cholecystitis 0.8%). Additionally, 865 patients (M:434, F:431) were admitted with sepsis (Pneumonia 535, UTI 413 and Cholecystitis 55). Of these, 54 (6.2%) developed dysphagia (Pneumonia 9.3%, UTI 3.4%, Cholecystitis 3.6%). Logistic regression revealed that increasing age, the presence of sepsis, delirium, dementia and Parkinson's disease (PD) were significantly associated with an increased risk of dysphagia (OR = 1.02, 1.74, 1.60, 2.43, 3.88; P = 0.002, 0.013, 0.008, Copyright © The Author(s) 2026. URL:

25. The Efficacy of IgM-Enriched Immunoglobulin (elg) Administration for Treatment of Sepsis and Septic Shock in Adult Surgical Patients: A Single-Center, Retrospective, Observational Study.

Authors: Spano S.; Licitra G.; Cucciolini G.; Brogi E.; Martinelli R.; Cundari F.; Curci M.G.; Coccolini F.; Busani S.; Berlot G.; Bixio M.; Biancofiore G.; Corradi F. and Forfori, F.

Publication Date: 2026

Journal: Journal of Clinical Medicine 15(4) (pagination), pp. Article Number: 1526. Date of Publication: 01 Feb 2026

Abstract: Background: Surgical sepsis, particularly secondary peritonitis, is a leading cause of ICU admissions, with mortality rates reaching 40%. In recent decades, several adjuvant therapies have been proposed in addition to standard of care to modulate the inflammatory response and support organ function. In our study, we aimed to evaluate the efficacy of IgM-enriched immunoglobulin (elg) treatment on outcome of adult surgical patients with sepsis and septic shock. Method(s): A single-center, retrospective, observational study was conducted from January 2016 to December 2019 in the

Intensive Care Unit of Pisa University Hospital. Patients with sepsis or septic shock resulting from primary or postoperative infections undergoing surgical source control were included. The primary outcome was to investigate the impact of elg administration on in-hospital mortality. The secondary outcomes were the ICU length of stay, days of ventilation, and vasoactive drug administration. A propensity score through inverse probability weighting was used to control for measured confounding variables. Result(s): A total of 108 patients, categorized into two groups based on whether they received elg, were included during the study period. Compared to the untreated group, patients who received elg showed a significant reduction in ICU mortality (ATE-0.17, 95% CI-0.33 to-0.03; p = 0.023) and in-hospital mortality (ATE-0.18, 95% CI-0.34 to-0.03; p = 0.022). However, the ICU length of stay and the duration of mechanical ventilation were significantly longer in the treated group (ATE + 7.1 days, 95% CI 3.1 to 11.1; p = 0.001 and ATE + 4.5 days, 95% CI 1.0 to 7.9; p = 0.011, respectively). No other statistically significant differences were observed. Conclusion(s): Despite the significant limitations of its observational nature, our study suggests that administering elg may reduce ICU and in-hospital mortality in surgical patients with sepsis and septic shock. Copyright © 2026 by the authors. URL:

26. Association of Hypercapnic and Nonrespiratory Acidemia With Hospital Mortality in Mechanically Ventilated Patients With Sepsis: A Retrospective Multicenter Cohort Study.

Authors: Tiruvoipati R.;Zheng J.;Gupta S.;Pilcher D.;Haji K.;Bailey M. and Paul, E.

Publication Date: 2026

Journal: Critical Care Medicine (pagination), pp. Date of Publication: 05 Mar 2026

Abstract:OBJECTIVES: The mortality among patients admitted with sepsis remains high and varies depending on the site of infection. The impact of hypercapnia and acidemia on clinical outcomes in mechanically ventilated patients with sepsis is not well understood. DESIGN: Multicenter, binational, retrospective study assessed the association of compensated hypercapnia, hypercapnic acidemia, and nonrespiratory acidemia, in mechanically ventilated patients with mortality in sepsis. SETTING: Data were extracted from the "Australian and New Zealand Intensive Care Society Centre for Outcome and Resource Evaluation adult patient" database over a 17-year period (from January 2006 to December 2022) from 201 ICUs. PATIENTS: Patients were classified into four mutually exclusive groups based on a combination of arterial pH and arterial Co₂ recorded during the first 24 hours of ICU stay: normocapnia with normal pH, fully compensated hypercapnia, hypercapnic acidemia, and nonrespiratory acidemia. Logistic regression and Cox proportional hazards regression were used to examine the association of compensated hypercapnia, hypercapnic, and nonrespiratory acidemia to hospital mortality. None. MEASUREMENTS AND MAIN RESULTS: Fifty-two thousand four hundred five patients were included. Overall compensated hypercapnia (odds ratio [OR], 1.39; 95% CI, 1.24-1.55; p CONCLUSION(S): Hypercapnic acidemia and nonrespiratory acidemia within the first 24 hours of ICU admission are associated with increased risk of hospital mortality in mechanically ventilated patients with sepsis. This association remains consistent in all diagnostic subgroups of sepsis. Copyright © 2026 by the Society of Critical Care Medicine and Wolters Kluwer Health, Inc. All Rights Reserved. URL:

27. Association between blood glucose trajectory and prognosis in septic patients in intensive care unit.

Authors: Wang H.;Wu J.;Liu J.;Xu Y.;Zhou L. and Jiang, C.

Publication Date: 2026

Journal: Zhonghua Wei Zhong Bing Ji Jiu Yi Xue 38(1), pp. 85–91

Abstract: OBJECTIVE: To investigate the relationship between dynamic blood glucose trajectories within 7 days of intensive care unit (ICU) admission and the risks of death and hypoglycemia in patients with sepsis. METHOD(S): Based on data from the Medical Information Mart for Intensive Care-IV (MIMIC-IV), adult patients with sepsis who had at least one blood glucose measurement per day within 7 days of ICU admission were selected as study subjects. Group-based trajectory modeling (GBTM) was used to analyze blood glucose trajectories within 7 days of ICU admission and determine the optimal number of subgroups. General patient information (gender, age, race, ICU type), disease status (disease severity scores, comorbidities), and monitoring, laboratory parameters, and treatments

type 2 diabetes mellitus, blood lactic acid (Lac) levels, blood urea nitrogen (BUN) levels, and the proportion of using vasopressors increased gradually (all P<0.05). Post-ICU admission blood glucose trajectory is closely associated with prognosis in patients with sepsis, with the highest mortality observed in patients with sustained hyperglycemia. Mortality gradually decreased as blood glucose levels decreased; maintaining blood glucose at a lower level of 5.6-6.7 mmol/L (100-120 mg/dL) was associated with the lowest mortality without increasing the risk of hypoglycemia. URL:

28. Association between beta-blocker use and outcomes in patients with sepsis-induced myocardial injury: An analysis based on MIMIC-IV and eICU databases.

Authors: Wu H.;Jiang L.;Qiu L.;Lin Z.;Liu H.;Lin X.;Wang X. and Huang, L.

Publication Date: 2026

Journal: International Journal of Infectious Diseases 165(pagination), pp. Article Number: 108458.
Date of Publication: 01 Ar 2026

Abstract: Background Sepsis-induced myocardial injury (SIMI) is a severe complication with high mortality. Beta-blocker therapy in SIMI remains controversial, lacking large-sample evidence. Objectives To evaluate beta-blocker impact on mortality in SIMI patients using Medical Information Mart for Intensive Care IV (MIMIC-IV) and emergency intensive care unit (eICU) databases. Methods A retrospective cohort study based on MIMIC-IV (2008-2022) and eICU (2014-2015) databases included adult SIMI patients meeting Sepsis-3.0 criteria with elevated cardiac troponin. The primary exposure was beta-blocker use during ICU stay, and the primary outcome was in-hospital all-cause mortality. 1:1 propensity score matching was used to balance baseline characteristics, with multiple sensitivity analyses to verify result robustness. Results MIMIC-IV included 2368 SIMI patients (1338 using beta-blockers); eICU included 3805 patients (1030 using beta-blockers). After propensity score matching (MIMIC-IV: 837/group; eICU: 902/group), beta-blocker use was associated with a significant reduction in-hospital mortality (MIMIC-IV: 19.7% vs 29.9%, OR = 0.75, 95% CI: 0.60-0.94; eICU: 28.6% vs 35.1%, OR = 0.70, 95% CI: 0.56-0.88). Long-term mortality was lower by 39% (28-day), 33% (90-day), and 27% (1-year) (all P = 0.008) had the greatest mortality reduction associated with beta-blocker use (55%). Prolonged hospital stay was consistent with a survival benefit rather than adverse effects. Conclusion Beta-blocker use is associated with reduced mortality and better long-term survival in SIMI patients, requiring prospective validation. Copyright © 2026 The Authors. URL:

29. Prediction model for quality of life in sepsis survivors one year after discharge.

Authors: Yao, Yi;Li, Wenjin;Hong, Dejiang;Chen, Ze;Peng, Kai and Zhao, Guangju

Publication Date: Mar 01 ,2026

Journal: World Journal of Emergency Medicine 17(2), pp. 105–112

Abstract: BACKGROUND: Sepsis survivors experience poor long-term quality of life post-discharge. The aim of this study was to analyze the factors that impact the long-term quality of life of sepsis survivors and develop a clinical prediction model. METHODS: A total of 442 sepsis patients from the Emergency Intensive Care Unit of a tertiary hospital in Wenzhou were included. These patients were assigned to the training set or the validation set at a ratio of 7:3. The European Quality of Life 5 Dimensions 5 Level Version (EQ-5D-5L) questionnaire was used to evaluate the quality of life in sepsis survivors one year after discharge. Multivariate logistic regression analysis was used to identify predictors, which were then used to develop the prediction model and subsequently derive a scoring system. The model's effectiveness was assessed using an area under the receiver operating characteristic curve, calibration curves, and clinical decision analysis. RESULTS: Of the 442 patients included, 70 died one year after discharge, and 372 completed the questionnaire. A total of 46.6% of sepsis survivors have poor quality of life one year after discharge in the training set. Multivariate logistic regression revealed that age, platelet, serum albumin, serum urea, and C-reactive protein were independent risk factors for poor quality of life in sepsis survivors. The area under the curve of the scoring system was 0.777 (95% CI: 0.726-0.828). The calibration curves showed that it was well calibrated. Decision curve analysis indicated that the scoring system provided good clinical usefulness. The internal validation also demonstrated its effectiveness. CONCLUSION: The prediction model incorporating five risk factors may predict quality of life one year after discharge in sepsis survivors,

which provides a measure to develop post-discharge rehabilitation and follow-up plans for this patient population. Copyright © 2026 World Journal of Emergency Medicine. URL:

30. Protective effect of statins in patients with sepsis-associated encephalopathy: a retrospective cohort study.

Authors: Zhou T.;Li L.;Yi J.;Gong X. and Huang, F.

Publication Date: 2026

Journal: Frontiers in Neurology 17(pagination), pp. Article Number: 1756916. Date of Publication: 2026

Abstract: Background: Sepsis-associated encephalopathy (SAE) is a severe neurological complication of sepsis. Statins may exerted protective effects in sepsis and its complications by reducing the dysregulated inflammatory response. However, it remains unknown whether statins provide any protective effect on SAE. Method(s): The data for this study were extracted from the MIMIC-IV database. Cox proportional hazards regression models were constructed to assess the association between statin therapy and mortality rate for in-hospital, 30-day, 90-day, 180-day, and 365-day. Kaplan-Meier survival curves were used to estimate survival probabilities between the non-statin group and statin group. Subgroup analysis was conducted to investigate potential variations in the effects of statin treatment on clinical outcomes among different groups. Result(s): A total of 4,707 patients with SAE were included in the study, with 2,387 in the non-statin group and 2,320 in the statin group. The findings indicated that the use of statins was linked to a considerable decrease in mortality rates. Patients who were administered statins experienced lower in-hospital mortality and demonstrated enhanced survival rates at 30, 90, 180, and 365days when compared to those not receiving statins. Further analysis of atorvastatin showed that the subgroup exhibited a similarly consistent reduction in mortality across all time points in comparison to the non-statin group. Interestingly, the protective effect associated with statin use remained significant regardless of the statin type, dosage, or exposure time. Conclusion(s): The use of statins was associated with short-term and long-term mortality among SAE patients admitted to the ICU. This association was observed irrespective of statin type, dosage, or exposure time. It is necessary to conduct large-scale prospective studies to further explore the relationship between statins and the prognosis of patients with SAE. Copyright © 2026 Zhou, Li, Yi, Gong and Huang. URL:

31. Global, regional, and national sepsis incidence and mortality, 1990-2021: a systematic analysis.

Authors: Gray A.P.;Chung E.;Hsu R.L.;Araki D.T.;Gershberg Hayoon A.;Davis Weaver N.;Swetschinski L.R.;Wool E.E.;Han C.;Mestrovic T.;Ikuta K.S.;Abbas N.;Abbasi M.;Abd ElHafeez S.;Abdisa W.M.;Abdoun M.;Abdullahi A.;Abebe M.;Abejew A.A.;Abie A., et al

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Abstract: Background: The global burden of sepsis, a life-threatening dysregulated host response to infection leading to organ dysfunction, remains challenging to quantify. We aimed to comprehensively estimate the global, regional, and national burden of sepsis, including the impact of the COVID-19 pandemic and underlying causes of sepsis-related deaths with co-occurring infectious syndromes. Method(s): We used multiple cause-of-death, hospital, minimally invasive tissue sampling, and linked death certificate and hospital record data representing 149 million deaths, covering 4290 location-years with mortality estimates from the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021 to capture explicit and implicit sepsis cases and deaths. We estimated age-location-sex-specific fractions of sepsis-related deaths from 195 underlying causes of death and 22 infectious syndromes from 1990 to 2021 using binomial logistic regression models, and estimated sepsis-related deaths using GBD cause-specific mortality estimates. Using 250 million hospital admissions and 7.82 million deaths from hospital data, representing 1310 location-years, we modelled case fatality rates by use of binomial logistic regression, applied to sepsis death estimates to estimate sepsis incidence by age, location, and year. Finding(s): In 2021, we estimated 166 million (95% uncertainty interval 135-201) sepsis cases and 21.4 million (20.3-22.5) all-cause sepsis-related deaths globally, representing 31.5%

of total global deaths. Sepsis-related deaths decreased between 1990 and 2019, followed by a surge in 2020 and 2021. As of 2021, individuals aged 15 years and older experienced increases across incidence (230%) and mortality (26.3%) since 1990. Those aged 70 years and older had the highest sepsis-related mortality in 2021 (9.28 million [8.74-9.86] deaths). Sepsis-related deaths from infectious underlying causes decreased from 11.8 million (11.1-12.5) in 1990 to 8.34 million (7.72-9.01) in 2019, then increased by 86.4% to 15.5 million (14.7-16.4) in 2021. Sepsis-related mortality due to non-infectious underlying causes of death increased from 4.69 million (4.35-5.05) in 1990 to 5.81 million (5.40-6.25) in 2021; the leading non-infectious underlying causes of death with sepsis were stroke, chronic obstructive pulmonary disease, and cirrhosis. In 2021, bloodstream infections inclusive of HIV and malaria (3.08 million [2.83-3.35]) and lower respiratory infections inclusive of COVID-19 (11.33 million [1.20-1.47]) were the most prominent infectious syndromes complicating sepsis-related deaths from non-infectious underlying causes, representing a consistent trend since 1990. Interpretation(s): The global burden of sepsis increased in 2020 and 2021, reversing progress from 1990. Sepsis incidence and mortality increased in people aged 15 years and older, especially those aged 70 years and older, and as a complication of non-infectious underlying causes of death such as stroke, primarily through bloodstream infections and lower respiratory infections. The global burden of sepsis is substantial, and sepsis is increasingly a complication of non-infectious causes of death. Funding(s): Gates Foundation, Wellcome Trust, and Department of Health and Social Care using UK aid funding managed by the Fleming Fund. Copyright © 2025 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY license. URL

32. Earlier ICU Transfer after CONCERN Early Warning System Score Escalation Reduced Sepsis-related Mortality: Results from a Multi-site Pragmatic Cluster Randomized Controlled Trial.

Authors: Lee R.Y.;Cato K.D.;Dykes P.C.;Lowenthal G.;Cho S.;Jia H.;Daramola T.;Tuteja S. and Rossetti, S. C.

Publication Date: 2024

Journal: AMIA ...Annual Symposium Proceedings.AMIA Symposium 2024, pp. 705–714

Abstract:Early recognition and timely escalation of care are critical for improving sepsis outcomes. This post-hoc analysis of a multi-site clinical trial examined whether the timing of ICU transfer following CONCERN Early Warning System (EWS) score escalation was associated with in-hospital mortality among patients later diagnosed with sepsis. Among 54 patients with CONCERN score changes prior to unanticipated ICU transfer, shorter score-change-to-ICU-transfer time intervals were significantly associated with lower odds of in-hospital death. A 36-hour threshold emerged as a potential inflection point; all patients transferred after this time interval died in the hospital. No significant differences were observed in the ICU-arrival-to-sepsis time interval between early and late transfers. These findings highlight the importance of acting promptly on early warning systems and suggest that CONCERN EWS may offer a meaningful lead time for intervention improving outcomes for sepsis patients. Copyright ©2024 AMIA-All rights reserved.

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