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Sepsis

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April 2025

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1. **Anaphylaxis with Elevated Procalcitonin Mimicking Sepsis: A Literature Review and Report of Two Cases.**

Authors: Banvolgyi A.;Lorincz K.;Boostani M.;Barllan E.;Hidvegi B.;Medvecz M.;Kiss N. and Wikonkal, N. M.

Publication Date: 2025

Journal: Journal of Clinical Medicine 14(3) (pagination), pp. Article Number: 785. Date of Publication: 01 Feb 2025

Abstract: Objectives: This review examines the role of serum procalcitonin (PCT) as a diagnostic marker for sepsis and its potential implications in anaphylaxis. Elevated PCT levels, often associated with bacterial infections, can complicate diagnosis when seen in anaphylaxis, especially when clinical features overlap with sepsis. Method(s): We conducted a literature review on PCT in anaphylaxis to highlight key patterns and present two cases of anaphylactic shock initially misdiagnosed as sepsis due to elevated PCT levels. Result(s): The review supports that elevated PCT can occur in anaphylaxis, stressing the need for thorough patient history and symptom evaluation. In both cases, elevated PCT led to initial sepsis diagnoses, but further investigation identified anaphylaxis triggered by sulfamethoxazole/trimethoprim (SMX/TMP). Conclusion(s): These findings emphasize the need for considering anaphylaxis in differential diagnoses when elevated PCT levels are observed. Increased awareness of PCT's potential association with allergic drug reactions is essential to ensure timely recognition, avoid diagnostic delays, and improve patient outcomes.

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2. **Health-Related Quality of Life Among Patients Who Have Survived an Episode of Sepsis in the United States: A Systematic Review.**

Authors: Basu S.;Wei Z.J.;Laor A.;Bennetts L.;Ahmad N.;El Khoury A.C.;Geurtsen J. and Neary, M. P.

Publication Date: 2025

Journal: Infectious Diseases and Therapy 14(2) (pp 385-400), pp. Article Number: e0270711. Date of Publication: 01 Feb 2025

Abstract: Introduction: Sepsis is a serious condition that may lead to death or profoundly affect the well-being of those who survive. The aim of this systematic review was to identify and summarize evidence on the impact of all-cause sepsis on health-related quality of life (HRQoL), physical, cognitive, and psychological outcomes among sepsis survivors in the USA. Method(s): Studies assessing HRQoL, physical, cognitive, and psychological outcomes in patients who survived an episode of sepsis and published from January 1, 2010, to September 30, 2023, were systematically identified through EMBASE, MEDLINE, and MEDLINE In-Process databases, as well as through gray literature. Result(s): Of 2885 records identified, 7 studies (7 publications; N = 180,592 participants) met the eligibility criteria for inclusion in this review. Studies examined the effects of sepsis on the following outcomes of interest: HRQoL (4 studies), physical functioning (5 studies), cognitive status (3 studies), and psychological well-being (3 studies). After 12 months, sepsis survivors who developed chronic critical illness (N = 63) had significantly poorer HRQoL as measured by EuroQoL 5-dimensional (EQ-5D) questionnaire mean utility index score and Short Form 36-item (SF-36) physical and mental summary scores compared with patients who rapidly recovered (N = 110). Among patients admitted to a skilled nursing facility post-sepsis (N = 66,540), 34% and 72.5% had severe or very severe cognitive impairment and dependence to perform activities of daily living, respectively. Significant increase in moderate-to-severe cognitive impairment among severe sepsis survivors (N = 623) before and after sepsis was reported (median 0.9 [IQR: 0.4, 1.4] years; 6.1% and 16.7%, respectively [P Result(s): Of 2885 records identified, 7 studies (7 publications; N = 180,592 participants) met the eligibility criteria for inclusion in this review. Studies examined the effects of sepsis on the following outcomes of interest: HRQoL (4 studies), physical functioning (5 studies), cognitive status (3 studies), and psychological well-being (3 studies). After 12 months, sepsis survivors who developed chronic critical illness (N = 63) had significantly poorer HRQoL as measured by EuroQoL 5-dimensional (EQ-5D) questionnaire mean utility index score and Short Form 36-item (SF-36) physical and mental summary scores compared with patients who rapidly recovered (N = 110). Among patients admitted to a skilled nursing facility post-sepsis (N = 66,540), 34% and 72.5% had severe or very severe cognitive impairment and dependence to perform activities of daily living, respectively. Significant increase in moderate-to-severe cognitive impairment among severe sepsis survivors (N = 623) before and after sepsis was reported (median 0.9 [IQR: 0.4, 1.4] years; 6.1% and 16.7%, respectively [P Conclusion(s): These findings underscore the profound negative impacts of sepsis on patients' HRQoL, ability to perform activities of daily living, and cognitive abilities.

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3. **Antibiotic use during the first episode of acute perianal sepsis: a still-open question.**

Authors: Blondin, Stanislas;Lobo, David;Egal, Axel;Ysmail-Dahlouk, Saliha;Taouk, Milad;Bourguignon, Josee;Blondeel, David and Etienney, Isabelle

Publication Date: Feb ,2025

Journal: Annals of Coloproctology 41(1), pp. 40–46

Abstract: PURPOSE: The role of antibiotics in preventing fistula formation following an initial abscess remains a subject of debate. This study compared the incidence of fistula in ano in patients experiencing their first episode of acute perianal sepsis, with and without antibiotic therapy, and evaluated the prevalence of fistula in ano necessitating surgical intervention at 1 year. METHODS: This retrospective cohort study was conducted at a tertiary care hospital with a dedicated proctology department. All patients who presented to the emergency proctology unit with a first episode of acute perianal sepsis were eligible for inclusion. RESULTS: This study included 276 patients. At 1 year, fistula formation was identified in 65.6% of all patients, 54.0% of those who had received antibiotics, and 75.0% of those who had not (P: This study included 276 patients. At 1 year, fistula formation was identified in 65.6% of all patients, 54.0% of those who had received antibiotics, and 75.0% of those who had not (PCONCLUSIONS: The rate of fistula formation was relatively high in this study. However, it was lower among patients with perianal sepsis who were treated with antibiotics, although a causal relationship could not be established. Prolonged follow-up is needed to clarify the role of antibiotic

therapy in preventing or delaying fistula development in patients with acute perianal sepsis.

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4. **Impact of underweight status on mortality in sepsis patients: a meta-analysis.**

Authors: Chen, Jiaan;Zhang, Fan;Liang, Li;Pan, Xuming;Zhang, Jiancheng and Jin, Guangjun

Publication Date: 2025

Journal: Frontiers in Medicine 12, pp. 1549709

Abstract: Objective: The evidence regarding the impact of underweight status on clinical outcomes in patients with sepsis are still scarce and controversial. We aimed at conducting a meta-analysis to evaluate the potential associations between underweight and the mortality rate among sepsis patients. Methods: A comprehensive electronic search was performed in PubMed, Cochrane Library, Embase, and Web of Science databases. Odds ratios (ORs) or mean differences and 95% confidence intervals (CIs) were calculated using RevMan 5.3. Results: A total of 58,348 patients (normal weight group: 49,084 patients; underweight group: 9,264 patients) from 23 studies were included in this meta-analysis. The results indicated that the in-hospital mortality (OR, 1.28; 95% CI, 1.21, 1.35; heterogeneity: I 2 = 21%, P = 0.21), 28-day mortality (OR, 1.54; 95% CI, 1.26, 1.88; heterogeneity: I 2 = 74%, P I 2 = 41%, P = 0.17) of underweight patients were significantly higher than those of normal weight patients. However, there was no significant difference in length of hospital stay or intensive care unit length of stay between underweight patients and normal-weight patients. Conclusion: Underweight is associated with increased mortality in patients with sepsis. Physicians should pay more attention to the management of underweight sepsis patients. Systematic review registration: https://www.crd.york.ac.uk/PROSPERO/display_record.php?RecordID=631417, identifier CRD42025631417. Copyright © 2025 Chen, Zhang, Liang, Pan, Zhang and Jin.

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5. **L-shaped association of body mass index with prognosis in individuals with sepsis: a multicenter cohort study.**

Authors: Cui, Kunping;Teng, Xiangnan;Liu, Wei;Zhao, Xiaoxiao;Xu, Shanling and Bai, Lang

Publication Date: Feb 03 ,2025

Journal: Diabetology & Metabolic Syndrome 17(1), pp. 43

Abstract: OBJECTIVE: The relationship between body mass index (BMI) and sepsis prognosis remains highly controversial and uncertain. This study investigated the association between BMI and prognosis in patients with sepsis. METHODS: This retrospective observational cohort study included adult patients admitted to the intensive care unit (ICU) with sepsis from Medical Information Mart for Intensive Care-IV version 2.2 (MIMIC-IV V2.2) and eICU Collaborative Research Database (eICU-CRD). The cut-off value of BMI was identified by the restricted cubic spline (RCS) curve and included patients were categorized into two groups: the low BMI group (: This retrospective observational cohort study included adult patients admitted to the intensive care unit (ICU) with sepsis from Medical Information Mart for Intensive Care-IV version 2.2 (MIMIC-IV V2.2) and eICU Collaborative Research Database (eICU-CRD). The cut-off value of BMI was identified by the restricted cubic spline (RCS) curve and included patients were categorized into two groups: the low BMI group (2) and the high BMI group (>= 28 kg/m2). The primary outcome was ICU mortality, and secondary outcomes were in-hospital and 28-day mortality. We performed the log-rank test to detect whether there is a difference in prognosis among different groups in two different cohorts. Multiple distinct models were used to validate the robustness of the results. RESULTS: There were 18,385 and 38,713 patients in the MIMIC-IV 2.2 and eICU-CRD cohorts, respectively. An L-shaped relationship was observed between BMI and ICU mortality in the primary analysis from MIMIC-IV 2.2. Similar relationships were found in eICU-CRD. When BMI was less than the cut-point, the risk of ICU mortality increased rapidly with decreasing BMI. When BMI was greater than the cut-point, the risk of ICU mortality levelled off as BMI increased. Sepsis patients with higher BMI values exhibited decreased ICU all-cause mortality rates (MIMIC-IV cohort: HR: 0.81, 95% CI 0.75-0.88, p : There were 18,385 and 38,713 patients in the

MIMIC-IV 2.2 and eICU-CRD cohorts, respectively. An L-shaped relationship was observed between BMI and ICU mortality in the primary analysis from MIMIC-IV 2.2. Similar relationships were found in eICU-CRD. When BMI was less than the cut-point, the risk of ICU mortality increased rapidly with decreasing BMI. When BMI was greater than the cut-point, the risk of ICU mortality levelled off as BMI increased. Sepsis patients with higher BMI values exhibited decreased ICU all-cause mortality rates (MIMIC-IV cohort: HR: 0.81, 95% CI 0.75-0.88, p : There were 18,385 and 38,713 patients in the MIMIC-IV 2.2 and eICU-CRD cohorts, respectively. An L-shaped relationship was observed between BMI and ICU mortality in the primary analysis from MIMIC-IV 2.2. Similar relationships were found in eICU-CRD. When BMI was less than the cut-point, the risk of ICU mortality increased rapidly with decreasing BMI. When BMI was greater than the cut-point, the risk of ICU mortality levelled off as BMI increased. Sepsis patients with higher BMI values exhibited decreased ICU all-cause mortality rates (MIMIC-IV cohort: HR: 0.81, 95% CI 0.75-0.88, p CONCLUSION: An L-shaped relationship was observed between BMI and prognosis in septic patients, indicating that lower BMI values are significantly linked to increased mortality. Targeted nutritional interventions and close monitoring for patients with low BMI could potentially enhance their prognosis. Therefore, BMI can also be utilized to categorize the risk levels of patients with sepsis and effectively predict their prognosis.

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6. **Comparative Study Between Quick Sepsis-Related Organ Failure Assessment (Qsofa), Modified Shock Index (MSI), and National Early Warning Score2 (News2) in Sepsis and it's Outcome in Emergency Department.**

Authors: Dhileeban C.M.;Prasad H.S.;Naidu S.K.;Jain A.;Gupta M. and Rajarajeshwaran

Publication Date: 2025

Journal: European Journal of Cardiovascular Medicine 15(2), pp. 89–98

Abstract: Introduction: Sepsis is defined as a "life-threatening organ dysfunction due to a dysregulated host response to infection". For early diagnosis and predict the outcome of sepsis many scoring systems are available. In present study we aimed to compare between quick sepsis-related organ failure assessment (qSOFA), modified shock index (MSI), and national early warning score2 (NEWS2) in sepsis and it's outcome in emergency department. Material(s) and Method(s): Present study was Observational, Prospective, Unicentric Study, conducted in patients of age >= 18yrs. both male and female, who met Suspected infection definition, qSOFA score, MSI, NEWS2 scores were calculated at time of admission. Result(s): Our study result shows qSOFA cut off value >= 2 significantly associated with patient morality and ICU stay > 3 days in sepsis. In our study qSOFA of value 2 predicting patients mortality, the sensitivity is 70%. From this study, MSI cut off value >= 1.88there is an increased probability of mortality in sepsis. Our results shows that in patients with an MSI>= 1.585there is an increased probability of ICU admission. In our study NEWS2 cut of value 9 score for predicting patients' mortality, the sensitivity is higher than qSOFA. Our results show that in patients with an NEWS2 cut of value 7.5there is an increased probability of ICU admission more than 3 days. In this observational study our findings suggest that for predicting mortality and ICU stay >3 days among all patients with suspected sepsis, NEWS2 score was more sensitive than qSOFA and MSI score. For predicting mortality, qSOFA has higher sensitivity than MSI but lower than NEWS2. No study compared MSI with other scores. Conclusion(s): NEWS2 is a better score than qSOFA and MSI in predicting sepsis mortality and ICU stay in emergency department.

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7. **Modified National Early Warning Scores (MNEWS) for Predicting the Outcomes of Suspected Sepsis Patients; A Prospective Cohort Study.**

Authors: Diskumpon, Nipon;Ularnkul, Busabong;Srivilaithon, Winchana;Phungoen, Pariwat and Daorattanachai, Kiattichai

Publication Date: 2025

Journal: Archives of Academic Emergency Medicine 13(1), pp. e24

Abstract: Introduction: The National Early Warning Score (NEWS) is commonly used to identify patients at high mortality risk. However, it has notable limitations. In this study, to enhance the accuracy, we revised it and evaluated the performance of modified NEWS (MNEWS) in predicting the outcomes of suspected sepsis patients. Methods: This single-center, prospective cohort study was conducted on patients with suspected sepsis to evaluate the accuracy of MNEWS in predicting mortality, survival to discharge, vasopressor requirements, and the need for mechanical ventilation. The MNEWS comprises the NEWS variables plus age, chronic major organ dysfunction, malignancy, functional status, and specific infected organ involvement. Sensitivity, specificity, likelihood ratio (LR), and area under the receiver operating characteristic curve (AUROC) were used to evaluate the performance of the MNEWS in predicting the studied outcomes. Results: Of the 1,393 patients included in this study, 209 died. Mean MNEWS was significantly higher in non-survivors than survivors (19.8 vs. 14.9, p= 18 had the highest accuracy for 30-day mortality prediction with 76.1% sensitivity, 75% specificity, positive LR of 3.13, and AUROC of 0.76 (95% CI: 0.73-0.79). The AUROC of MNEWS >=18 for predicting survival until discharge, need for vasopressors, and need for mechanical ventilation were 0.75 (95% CI: 0.72-0.78), 0.72 (95% CI: 0.69-0.75), and 0.76 (95% CI: 0.73-0.79), respectively. Additionally, MNEWS >=18 demonstrated superior predictive performance, compared with NEWS >=7 and qSOFA >=2 for various clinical outcomes. Conclusions: The MNEWS was similar to the NEWS in overall predictive accuracy for 30-day mortality but exhibited a higher predictive accuracy than did the qSOFA score. Notably, MNEWS >=18 was a significant indicator of 30-day mortality risk, as well as the likelihood of requiring vasopressors, survival to discharge, and 7-day mortality.

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8. **Unveiling the potential role of the shock index in maternal sepsis: reality or fantasy?.**

Authors: Escobar M.F.;Ramos I.;Marta Guerra K.;Soto Franco N.;GalindoSanchez J.S.;LibrerosPena L.;PenaZarate E.E.;GuevaraCalderon L.A.;GomezMoreno H. and Echavarria, M. P.

Publication Date: 2025

Journal: Journal of Maternal-Fetal and Neonatal Medicine 38(1) (pagination), pp. Article Number: 2453999. Date of Publication: 2025

Abstract: Objective: Maternal sepsis continues to be a maternal health problem associated with 75,000 deaths per year worldwide, representing a greater burden in low- and middle-income countries (LMICs). Although the Shock Index (SI) has been widely studied in postpartum hemorrhage and in non-obstetric populations, it has not yet been widely studied in sepsis. We aimed to identify the relationship between Shock Index and suspected sepsis in pregnant and postpartum patients to explore the use of Shock index in the context of maternal sepsis and its relationship with sepsis-related outcomes. Method(s): A single-center, retrospective, case-control study was conducted, including pregnant and postpartum patients attended between June 2015 and December 2020 in a high-complexity university hospital. This study was conducted in a High Obstetric Complexity Unit (UACO) in the southwest region of Colombia. Pregnant or postpartum women with infectious processes of obstetric or non-obstetric origins were included. Cases had sepsis diagnosis; controls showed infection process and systemic inflammatory response signs without confirmed sepsis. Those with unconfirmed infections and preterm conditions were excluded. A logistic regression model was conducted to examine the association between maternal factors and sepsis diagnosis, and significant variables were determined through univariate analysis and included in a multivariate model. Result(s): A total of 640 patients were included (343 cases and 297 controls), sepsis was significantly associated with a higher shock index at admission SI >= 0.9 (85.4% vs 75%, p = 0.001). No correlation was found between the Shock Index and C-reactive protein (CRP), leukocyte count, or ICU length of stay. The area under the receiver operating characteristic curve (AUROC) analysis identified a Shock Index of 1 as the optimal cutoff point, while the cutoff point of 0.9 demonstrated the highest sensitivity (85%). An SI >= 0.9 increased the risk of sepsis 1.94 times (95% CI 1.31-2.91, p = 0.001) and remained significant in the adjustment model (OR_adj 2.18, 95% CI 1.42-3,32, p = 0.9. Conclusion(s): Our findings underscore the importance of using the Shock Index with a cutoff point of 0.9 as a predictive tool for sepsis in pregnant patients, emphasizing the need for timely intervention and continuous monitoring of patients.Copyright © 2025

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9. **Sepsis: the evolution of molecular pathogenesis concepts and clinical management**

Authors: Feng, Zhongxue;Wang, Lijun;Yang, Jing;Li, Tingting;Liao, Xuelian;Kang, Yan;Xiao, Fei and Zhang, Wei

Publication Date: Mar ,2025

Journal: MedComm 6(3), pp. e70109

Abstract: The mortality rate of sepsis is approximately 22.5%, accounting for 19.7% of the total global mortality. Since Lewis Thomas proposed in 1972 that "it is our response that makes the disease (sepsis)" rather than the invading microorganisms, numerous drugs have been developed to suppress the "overwhelming" inflammatory response, but none of them has achieved the desired effect. Continued failure has led investigators to question whether deaths in septic patients are indeed caused by uncontrolled inflammation. Here, we review the history of clinical trials based on evolving concepts of sepsis pathogenesis over the past half century, summarize the factors that led to the failure of these historical drugs and the prerequisites for the success of future drugs, and propose the basic principles of preclinical research to ensure successful clinical translation. The strategy of targeting inflammatory factors are like attempting to eliminate invaders by suppressing the host's armed forces, which is logically untenable. Sepsis may not be that complex; rather, sepsis may be the result of a failure to fight microbes when the force of an invading pathogen overwhelms our defenses. Thus, strengthening the body's defense forces instead of suppressing them may be the correct strategy to overcome sepsis. Copyright © 2025 The Author(s). MedComm published by Sichuan International Medical Exchange & Promotion Association (SCIMEA) and John Wiley & Sons Australia, Ltd.

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10. **Viral sepsis - pathophysiology and disease manifestation.**

Authors: G Gurtler L.;Schramm W. and Seitz, R.

Publication Date: 2025

Journal: Infection (pagination), pp. Date of Publication: 2025

Abstract: Viral infection is found in approximately 30% of all sepsis cases and may be followed by bacterial infection in organs such as the lungs. Sepsis manifests as fever, hemorrhagic lesions and cell death. Organ dysfunction caused by sepsis, such as meningitis and encephalitis, can lead to organ damage. Sepsis is induced by various viral components, host cells and cellular mediators, such as cytokines and chemokines. Cytokines are secreted from stimulated macrophages, monocytes, dendritic cells and T lymphocytes. Further contributors to sepsis are the cleavage products after activation of the complement cascade with anaphylatoxin generation and peptides of the activated clotting cascade, thrombocytopenia and thrombocyte function alteration, intravasal clotting and/or endothelial leakage. The cells involved in viral sepsis are neutrophil granulocytes, monocytes and macrophages, dendritic cells and thrombocytes, and finally, endothelial cells and epithelial cells. Prolonged cytokine release leads to cell damage, immune cell dysfunction and exhaustion, and either impairs or hyperactivates immune cells. The course of viral sepsis may be enhanced by some patient conditions including age, underlying diseases such as diabetes, obesity; and immunodeficiency. Viral sepsis, similar to bacterial sepsis, is an extremely complex disorder, and the involvement of the abovementioned cellular and humoral components can present quite divergent biological and clinical patterns. Examples of viral sepsis discussed in the manuscript include three viruses causing Dengue fever - an emerging infection, COVID-19 - a disease with a prolonged course, Ebola disease - a disease with typically complete viral clearance, while rabies virus - induces a disease that causes coma and death before signs of viral sepsis are apparent.Copyright © The Author(s) 2025.

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11. **Early high-sensitivity troponin elevation and short-term mortality in sepsis: a systematic review with meta-analysis.**

Authors: Gajardo, Abraham I. J.;Ferriere-Steinert, Santiago;Valenzuela Jimenez, Joaquin;Heskia Araya, Sebastian;Kouyoumdjian Carvajal, Thomas;Ramos-Rojas, Jose and Medel, Juan Nicolas

Publication Date: Feb 14 ,2025

Journal: Critical Care (London, England) 29(1), pp. 76

Abstract: BACKGROUND: Serum cardiac troponin (cTn) elevation is a well-established phenomenon in sepsis. However, the clinical significance of this phenomenon with high-sensitivity (hs) assays and the current sepsis definition needs to be settled. RESEARCH QUESTION: What is the association between early serum cTn levels measured by hs-assays and the risk of short-term mortality in septic patients? STUDY DESIGN AND METHODS: We conducted a systematic review using a comprehensive PubMed, Scopus, and Embase search. Studies were eligible if they reported association data on early hs-cTn and mortality in an adult sample with sepsis that met the Sepsis-3 definition. For the synthesis of the effect of hs-cTn on mortality, we applied random effect models on the pooled unadjusted and adjusted odds ratio (OR and aOR, respectively) of elevated vs. normal hs-cTn serum values, and on the crude standardized mean difference (SMD) of hs-cTn between survivors and non-survivors. RESULTS: In total, 6242 patients from 17 studies were included, with short-term mortality rates ranging from 16.9% to 53.8%. Using a crude analysis, non-survivor patients showed higher hs-cTn than survivors (SMD of 0.87, 95%CI: 0.41-1.33). Elevated hs-cTn was associated with increased mortality (OR = 1.78, 95% CI: 1.41-2.25). However, this prognostic effect was absent in studies that adjusted for different confounders (aOR = 1.06, 95% CI: 0.99-1.14). DISCUSSION AND CONCLUSIONS: Non-survivors of sepsis exhibited significantly elevated hs-cTn levels. While elevated hs-cTn levels are associated with an increased risk of mortality, they are not independently associated with this outcome in sepsis. Copyright © 2025. The Author(s).

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12. **Suspected sepsis: patient assessment and management in the emergency department.**

Authors: Hird C. and Parker, M.

Publication Date: 2025

Journal: Emergency Nurse : The Journal of the RCN Accident and Emergency Nursing Association (pagination), pp. Date of Publication: 11 Feb 2025

Abstract: Sepsis is a potentially life-threatening condition triggered by infection that is responsible for an estimated 48,000 deaths in the UK each year. Its pathophysiology is complex, its symptomology non-specific and its clinical presentations extremely varied. Despite numerous campaigns to raise awareness of sepsis, it still goes undetected. In 2024, the National Institute for Health and Clinical Excellence revised its guideline on sepsis and the UK Sepsis Trust published the seventh edition of its Sepsis Manual. This article discusses the pathophysiology of sepsis and how emergency nurses should assess and manage patients with suspected sepsis. It describes the tools available to them, including the National Early Warning Score 2 and the Sepsis 6, and emphasises the importance of early antibiotic administration, serial lactate measurements, source control and antimicrobial stewardship.

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13. **Relationship between the geriatric nutritional risk index and sepsis in elderly critically ill patients: a retrospective cohort study.**

Authors: Jin Y.;Zhou T.;Hou C.;Zhang H. and Xu, B.

Publication Date: 2025

Journal: European Journal of Medical Research 30(1) (pagination), pp. Article Number: 130. Date of Publication: 01 Dec 2025

Abstract: Objective: To investigate the relationship between the geriatric nutritional risk index (GNRI) and sepsis in elderly critically ill patients. Method(s): We extracted data from the MIMIC-IV database for patients aged 65 and older who were first-time admissions to the Intensive Care Unit. The GNRI, derived from serum albumin, height, and weight, served as the exposure variable. The main outcome was the occurrence of sepsis. We utilized multivariable logistic regression to evaluate the association between GNRI and sepsis. Additionally, we employed restricted cubic splines to evaluate the potential nonlinear relationship between GNRI and the incidence of sepsis. Result(s): The study included 3,535 elderly patients, with 2,005 (56.7%) developing sepsis. Septic patients had significantly lower GNRI values (median: 99 vs. 101, P = 0.021) and a higher prevalence of malnutrition risk (GNRI Result(s): The study included 3,535 elderly patients, with 2,005 (56.7%) developing sepsis. Septic patients had significantly lower GNRI values (median: 99 vs. 101, P = 0.021) and a higher prevalence of malnutrition risk (GNRI Conclusion(s): The study reveals a U-shaped association between GNRI and sepsis in elderly critically ill patients. Both low and high GNRI values are associated with increased sepsis risk, with a turning point at 105.4. These findings highlight GNRI's utility as a screening tool for identifying sepsis risk in elderly ICU patients.Copyright © The Author(s) 2025.

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14. **Association between lactate-to-albumin ratio and all-cause mortality in critically ill cirrhotic patients with sepsis: a retrospective analysis of the MIMIC-IV database.**

Authors: Ma Y.;Du L.;Bai L. and Tang, H.

Publication Date: 2025

Journal: BMC Gastroenterology 25(1) (pagination), pp. Article Number: 112. Date of Publication: 01 Dec 2025

Abstract: Background: The impact of lactate-to-albumin ratio (LAR) on mortality of critically ill cirrhotic patients with sepsis is scant. Method(s): Critically ill cirrhotic patients with sepsis were obtained from the MIMIC-IV database (v3.0). Cox regression models alone and in combination with restricted cubic splines, generalized additive models and smoothed curve fitting were used to investigate the relationship between LAR and all-cause mortality. Result(s): A total of 1864 patients were included. The 30-day, 90-day, and 180-day all-cause mortality rates were 38.0%, 46.3%, and 49.5%, respectively. Higher LAR were significantly and nonlinearly associated with higher risks of 30-day, 90-day, and 180-day all-cause mortality (all adjusted HR = 1.17, P Result(s): A total of 1864 patients were included. The 30-day, 90-day, and 180-day all-cause mortality rates were 38.0%, 46.3%, and 49.5%, respectively. Higher LAR were significantly and nonlinearly associated with higher risks of 30-day, 90-day, and 180-day all-cause mortality (all adjusted HR = 1.17, P Result(s): A total of 1864 patients were included. The 30-day, 90-day, and 180-day all-cause mortality rates were 38.0%, 46.3%, and 49.5%, respectively. Higher LAR were significantly and nonlinearly associated with higher risks of 30-day, 90-day, and 180-day all-cause mortality (all adjusted HR = 1.17, P = 1.05 had higher risks of 30-day, 90-day, and 180-day all-cause mortality (adjusted HR (95% CI): 1.48 (1.27-1.72), 1.44 (1.25-1.66), and 1.38 (1.21-1.57), respectively). No potential modifiers were found in the relationship between LAR and mortality. Conclusion(s): LAR was positively and nonlinearly associated with all-cause mortality in critically ill cirrhotic patients with sepsis. Thus, it could be used as a prognostic biomarker.Copyright © The Author(s) 2025.

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15. **Lactate-enhanced-qSOFA (LqSOFA) score as a predictor of in-hospital mortality in patients with sepsis: systematic review and meta-analysis.**

Authors: MoncadaGutierrez D.;VasquezTirado G.A.;MeregildoRodriguez E.D.;QuispeCastaneda C.V.;CuadraCampos M.;AbantoMontalvan P.H.;GuzmanAguilar W.M.;LinanDiaz L.J.;AlvaGuarniz H.N. and RodriguezChavez, L. A.

Publication Date: 2025

Journal: European Journal of Trauma and Emergency Surgery : Official Publication of the European

Trauma Society 51(1), pp. 33

Abstract: INTRODUCTION: Sepsis is a systemic process that refers to a deregulated immune response of the host against an infectious agent, involving multiple organ dysfunction. It is rapidly progressive and has a dismal prognosis, with high mortality rates. For this reason, it is necessary to have a tool for early recognition of these patients, with the aim of treating them appropriately in a timely manner. METHOD(S): This research is a systematic review based on bibliography indexed in four online scientific databases for studies published since inception to February 2024, which was obtained through the use of a search strategy. Eight studies were identified for quantitative analysis and included in our meta-analysis. RESULT(S): The meta-analysis revealed that among 23,551 patients diagnosed with sepsis, 5,825 had a positive LqSOFA, and 3,086 experienced the primary outcome (mortality). For LqSOFA, a sensitivity of 0.61 (95% CI 0.60-0.63), specificity of 0.81 (95% CI 0.80-0.81), positive likelihood ratio (LR+) of 3.46 (95% CI 2.86-4.18), negative likelihood ratio (LR-) of 0.47 (95% CI 0.38-0.59), and odds ratio (OR) of 7.43 (95% CI 6.01-9.20) were determined. The area under the curve (AUC) was 0.807. CONCLUSION(S): The LqSOFA score demonstrates a good predictive capacity for in-hospital mortality in septic patients, showing clinically significant levels of sensitivity (69%) and specificity (79%).

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16. **A Screening Tool to Predict Sepsis in Patients With Suspected Infection in the Emergency Department.**

Authors: Oi, Yasufumi;Ogawa, Fumihiro;Honzawa, Hiroshi;Abe, Takeru;Imaki, Shouhei and Takeuchi, Ichiro

Publication Date: Feb ,2025

Journal: Cureus 17(2), pp. e78728

Abstract: Background and objective Sepsis is a life-threatening condition associated with high morbidity and mortality, and hence early recognition and treatment are crucial. The 2016 Sepsis-3 guidelines introduced the quick Sequential Organ Failure Assessment (qSOFA), but its low sensitivity limits early detection. The 2021 Surviving Sepsis Campaign Guidelines (SSCG) discourage relying solely on qSOFA and recommend additional tools such as the systemic inflammatory response syndrome (SIRS) score, the National Early Warning Score (NEWS), and the Modified Early Warning Score (MEWS) along with lactate measurement. This study assessed whether combining qSOFA with quantitative capillary refill time (Q-CRT) or lactate levels enhances early sepsis diagnosis in emergency departments. Methods This retrospective, multi-facility observational study was conducted at two hospitals in Yokohama, Japan. Patients with suspected infections who underwent Q-CRT measurement were included. Q-CRT was measured using a pulse oximeter-based device that records the time taken for blood flow to return to 90% after compression. Receiver operating characteristic (ROC) curves determined the area under the curve (AUC), sensitivity, and specificity. Statistical significance was set at p0.8), while Q-CRT and lactate levels demonstrated moderate predictive accuracy with AUCs exceeding 0.7. The SIRS score had the lowest predictive ability, with an AUC of approximately 0.6. Combining qSOFA with Q-CRT or lactate levels significantly improved sensitivity and specificity. The qSOFA+Q-CRT combination resulted in an AUC of 0.821, sensitivity of 83.3%, and specificity of 81.4%, while the qSOFA+lactate combination yielded an AUC of 0.844, sensitivity of 87.5%, and specificity of 81.4%. These combinations exceeded 80% in both sensitivity and specificity, unlike the SIRS-based combinations, which showed limited improvement and specificity below 40%. While the qSOFA score alone demonstrated limited sensitivity, combining it with Q-CRT or lactate levels enhanced its predictive performance for early sepsis detection. This approach improved sensitivity without compromising specificity. The increase in sensitivity and specificity is likely due to Q-CRT and lactate identifying sepsis cases not detected by qSOFA, thereby making the combined approach more reliable for clinical use. Lactate levels are well-established markers associated with sepsis severity, and Q-CRT offers a non-invasive means of assessing peripheral perfusion. Conclusions Combining qSOFA with Q-CRT or lactate levels significantly improves early sepsis detection by enhancing both sensitivity and specificity. These combinations offer superior diagnostic

accuracy compared to standalone tools, supporting their potential integration into clinical protocols for better patient outcomes. Further prospective studies are needed to validate these findings across diverse clinical settings. Copyright © 2025, Oi et al.

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17. **Enhancing in-hospital mortality prediction in older patients with sepsis: the role of frailty indices and multidrug-resistance status in non-ICU wards-a proof-of-concept study.**

Authors: Okoye C.;Piazzoli A.;Ferrara M.C.;Finazzi A.;Ornago A.M.;Pinardi E.;Tonus B.;Mazzola P.;Ticinesi A. and Bellelli, G.

Publication Date: 2025

Journal: Aging Clinical and Experimental Research 37(1) (pagination), pp. Article Number: 45. Date of Publication: 01 Dec 2025

Abstract: Background: Prognostic stratification in older patients with sepsis is challenging due to frailty and the role of multidrug-resistant (MDR) infections. Aim(s): To test the predictive accuracy of different frailty measures, blood routine tests and MDR infection status for in-hospital mortality among older patients with sepsis. Method(s): Consecutive patients aged >= 65 years with qSOFA >= 2 and positive cultures admitted to a tertiary care hospital were enrolled. Frailty was assessed using the Clinical Frailty Scale (CFS), the Primary Care-Frailty Index (PC-FI), and a 50-item FI. A base logistic regression model including age, sex, WBC count, platelets, creatinine, hs-CRP, and lactate predicted mortality. Frailty indices and MDR status were sequentially added, and model performance was compared using the area under the Receiver Operating Characteristics (AUROC). A nomogram was developed to visualize mortality probabilities. Result(s): Among 93 patients (median age 80, IQR [72-84] years, 63.4% males), in-hospital mortality was 16.1%. Deceased patients were frailer and had a higher number of comorbidities. By logistic multivariable regression, the base model achieved an AUROC of 0.771 for predicting in-hospital mortality. Adding frailty indices improved model performance to 0.800 (PC-FI), 0.817 (CFS), and 0.823 (FI). Incorporating MDR status further increased AUROC to 0.890 (PC-FI + MDR), 0.907 (CFS + MDR), and 0.922 (FI + MDR), outperforming the base model (p Result(s): Among 93 patients (median age 80, IQR [72-84] years, 63.4% males), in-hospital mortality was 16.1%. Deceased patients were frailer and had a higher number of comorbidities. By logistic multivariable regression, the base model achieved an AUROC of 0.771 for predicting in-hospital mortality. Adding frailty indices improved model performance to 0.800 (PC-FI), 0.817 (CFS), and 0.823 (FI). Incorporating MDR status further increased AUROC to 0.890 (PC-FI + MDR), 0.907 (CFS + MDR), and 0.922 (FI + MDR), outperforming the base model (p Conclusion(s): Incorporating frailty indices and MDR status of culture isolates into traditional prognostic parameters improves mortality prediction in older patients admitted with sepsis, enabling more accurate risk stratification and personalized treatment strategies.Copyright © The Author(s) 2025.

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18. **Mental health in the first year after ICU-treated sepsis: Analysis of administrative diagnoses in German health claims data.**

Authors: Sell S.;FleischmannStruzek C.;Spoden M. and Rosendahl, J.

Publication Date: 2025

Journal: General Hospital Psychiatry 93, pp. 109–115

Abstract: Objective: We aimed to quantify the (co-)occurrence of and risk factors for mental health impairments (MHI) in a cohort of sepsis survivors within 12 months after ICU stay in Germany. Method(s): Population-based cohort study using nationwide de-identified health claims data of the German AOK health insurance. Patients with sepsis hospitalization and ICU treatment were identified by ICD-10 and procedural codes. Among 12-months survivors, we assessed new and prevalent MHI by ICD-10 diagnoses in the outpatient and inpatient health sector. Risk factors for MHI were assessed by multiple logistic regression analyses. Result(s): Of 21,980 sepsis survivors, 54.8 % were diagnosed with any MHI in the 12 months post-discharge. 25.4 % of patients without pre-existing MHI had a new

MHI diagnosis. Co-occurrence of MHI was common. Pre-existing depression, anxiety disorder, PTSD, substance use disorder and sleep disorder significantly increased the odds for a diagnosis of any MHI post-sepsis between six- and nine-fold, while treatment-related factors had no influence. Conclusion(s): MHI is common among sepsis survivors, particularly in those affected by any pre-existing psychological diagnoses. Early assessment of pre-existing psychopathology might help to identify patients at risk for prevention or treatment interventions.

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19. **Thrombocytopenia in Sepsis**

Authors: Setarehaseman, Alireza;Mohammadi, Abbas and Maitta, Robert W.

Publication Date: Feb 11 ,2025

Journal: Life 15(2)

Abstract: Platelets, traditionally known for their role in hemostasis, have emerged as key players in immune response and inflammation. Sepsis, a life-threatening condition characterized by systemic inflammation, often presents with thrombocytopenia, which at times, can be significant. Platelets contribute to the inflammatory response by interacting with leukocytes, endothelial cells, and the innate immune system. However, excessive platelet activation and consumption can lead to thrombocytopenia and exacerbate the severity of sepsis. Understanding the multifaceted roles of platelets in sepsis is crucial for developing effective therapeutic strategies. Targeting platelet-mediated inflammatory responses and promoting platelet production may offer potential avenues for improving outcomes in septic patients with thrombocytopenia. Future research should focus on elucidating the mechanisms underlying platelet dysfunction in sepsis and exploring novel therapeutic approaches to optimize platelet function and mitigate inflammation. This review explores the intricate relationship between platelets, inflammation, and thrombosis in the context of sepsis.

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20. **Survival of Patients with Solid Tumours and Sepsis Admitted to Intensive Care in a Tertiary Oncology Centre: A Retrospective Analysis.**

Authors: Smith S.S.;Edwards L.;Wigmore T.;Jhanji S.;Antcliffe D.B. and Tatham, K. C.

Publication Date: 2025

Journal: Journal of Intensive Care Medicine (pagination), pp. Date of Publication: 2025

Abstract: Introduction: Sepsis is a life-threatening organ dysfunction caused by a dysregulated host response to infection. Patients with cancer are at risk of developing sepsis and requiring intensive care unit (ICU) admission. We aimed to assess survival of patients with a solid tumour admitted to ICU as an emergency with sepsis, and to identify predictors of 90-day survival at admission. Material(s) and Method(s): We conducted a retrospective cohort survival analysis. We identified adults with a solid tumour admitted to ICU with sepsis between 01/01/2011 and 31/12/2020 at a tertiary oncology centre with two hospitals (London and Surrey, UK). We defined sepsis using the Sepsis-3 definition. The primary outcome was 90-day survival. We used the parametric accelerated failure time model for multivariate analysis to generate acceleration factors (AF). Result(s): 625 patients were identified and the 90-day survival rate was 59.5%(353/593).Multivariate analysis identified the presence of localized (AF 0.13, 95% CI 0.06-0.25) or regionalized disease (AF 0.21, 95% CI 0.12-0.36) compared to distant metastatic disease, unplanned surgery on the day of admission (AF 0.15, 95% CI 0.07-0.31), lactate (AF 1.25 95% CI 1.15-1.35), Sequential Organ Failure Assessment Score (AF 1.19, 95% CI 1.12-1.27), previous radiotherapy (AF 1.89, 95% CI 1.14-3.125), previous systemic anti-cancer treatment (excluding hormonal therapy) (AF 1.49, 95% CI 0.93-2.38), bacteraemia (AF 0.47, 95% CI 0.27-0.81) and serum albumin (AF 0.94, 95% CI 0.91-0.98) as independent predictors of 90-day survival. Conclusion(s): This study of solid tumour patients admitted to ICU is one of the largest providing survival data to inform clinicians and patients. This data provides information on factors that should be considered when deliberating the possible outcome of ICU admission for a patient with solid malignancy and sepsis and highlights that the presence of cancer itself should not limit ICU admission

for sepsis.Copyright © The Author(s) 2025.

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21. **Postoperative sepsis and its sequential impact on dementia.**

Authors: Sun M.;Li F.;Wang Y.;Miao M.;Lu Z.;Chen W.M.;Wu S.Y. and Zhang, J.

Publication Date: 2025

Journal: Critical Care 29(1) (pagination), pp. Article Number: 66. Date of Publication: 01 Dec 2025

Abstract: Background: Postoperative sepsis is a severe complication associated with increased mortality and potential long-term cognitive decline, including dementia. However, the relationship between postoperative sepsis and dementia remains poorly understood. Method(s): This retrospective cohort study used data from the National Database in Taiwan, covering the period from January 1, 2005, to December 31, 2022. The index period for surgeries was set between January 1, 2008, and December 31, 2013, allowing the identification of patients without prior dementia. A landmark period of 12 months following surgery was defined to capture the number of postoperative sepsis events, which were then analyzed for their impact on dementia risk. After 1:4 propensity score matching (PSM), dementia and mortality were evaluated using Cox proportional hazards and Fine-Gray competing risk models. Result(s): Following PSM, 778 patients were in the postoperative sepsis group and 3,112 in the non-postoperative sepsis group. Dementia incidence was higher in the postoperative sepsis group (26%) compared to the non- postoperative sepsis group (13.6%), with a hazard ratio (HR) of 1.25 (95% CI, 1.03-1.52). A dose-response relationship was observed, with dementia rates of 24.5% for one postoperative sepsis event and 34.9% for two or more events, the latter showing an HR of 1.77 (95% CI, 1.17-2.66). Mortality was also elevated in the postoperative sepsis group (40.5% vs. 31.6%; HR 1.45, 95% CI, 1.28-1.65). Conclusion(s): Postoperative sepsis is significantly associated with increased dementia risk in a dose-dependent manner. These findings highlight the importance of enhancing perioperative infection control to reduce both immediate and long-term cognitive complications.Copyright © The Author(s) 2025.

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22. **Intraoperative Low-Dose Glucocorticoids in Surgical Patients With Abdominal Sepsis: A Multicenter Retrospective Cohort Study.**

Authors: Tao, Tianzhu;Shi, Yue;Ye, Xiaofei;Mi, Weidong and Lou, Jingsheng

Publication Date: Feb ,2025

Journal: Health Science Reports 8(2), pp. e70360

Abstract: Background and Aims: Abdominal sepsis refers to a severe and potentially life-threatening condition characterized by the presence of infection, inflammation, and tissue damage within the abdominal cavity. Glucocorticoids (GCs) play an important role in regulation of the host immune and inflammation responses involved in sepsis and surgery. This study aimed to investigate the potential impact of intraoperative GCs administration on the clinical outcome of surgical patients with abdominal sepsis. Methods: This retrospective cohort study included a 1:1 propensity score-matched cohort of surgical patients afflicted with abdominal sepsis at two medical centers from January 2008 to December 2022. Patients were classified into low-GCs, high-GCs, and non-GCs groups according to the dosage of steroids used intraoperatively, and in-hospital mortality was designated as the primary outcome. Results: This study included a total of 476 patients, with 217 in the non-GCs group, 213 in the low-GCs group, and 46 in the high-GCs group. The overall in-hospital mortality rate was 7.56%. After propensity score matching (PSM), there were 168 cases in both the low-GCs group and the non-GCs group, with no significant differences observed between the groups regarding mortality rate, length of hospital-stay, and duration of intensive care unit (ICU) stay. In patients with septic shock, the use of low-dose GCs increased the urine output and decreased the requirements for vasopressors on the first postoperative day, however, it had no impact on the in-hospital mortality or ICU stay. Moreover, prophylactic use of GCs during anesthesia induction did not decrease the incidence of intraoperative hypotension or necessity of vasopressors use. Conclusion: Intraoperative administration of low-dose

GCs demonstrates a transient improvement in hemodynamics of patients with septic shock, however, it did not lead to improved clinical outcomes. Further research remains necessary to elucidate the optimal perioperative dosing strategy. Copyright © 2025 The Author(s). Health Science Reports published by Wiley Periodicals LLC.

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23. **Early systemic insults following severe sepsis-associated encephalopathy of critically ill patients: association with mortality and awakening-an analysis of the OUTCOMEREA database.**

Authors: Thy M.;Sonneville R.;Ruckly S.;Mourvillier B.;Schwebel C.;Cohen Y.;GarrousteOrgeas M.;Siami S.;Bruel C.;Reignier J.;Azoulay E.;Argaud L.;GoldgranToledano D.;Laurent V.;Dupuis C.;Poujade J.;Bouadma L.;de Montmollin E. and Timsit, J. F.

Publication Date: 2025

Journal: Journal of Intensive Care 13(1) (pagination), pp. Article Number: 5. Date of Publication: 01 Dec 2025

Abstract: Background: Sepsis-associated encephalopathy (SAE) may be worsened by early systemic insults. We aimed to investigate the association of early systemic insults with outcomes of critically ill patients with severe SAE. Method(s): We performed a retrospective analysis using data from the French OUTCOMEREA prospective multicenter database. We included patients hospitalized in intensive care unit (ICU) for at least 48 h with severe SAE (defined by a score on the Glasgow Coma Scale (GCS) Method(s): We performed a retrospective analysis using data from the French OUTCOMEREA prospective multicenter database. We included patients hospitalized in intensive care unit (ICU) for at least 48 h with severe SAE (defined by a score on the Glasgow Coma Scale (GCS) = 11 mmol/L), hypotension (diastolic blood pressure = 11 mmol/L), hypotension (diastolic blood pressure = 38.3 degreeC), anemia (hematocrit = 38.3 degreeC), anemia (hematocrit = 145 mmol/L), oxygenation abnormalities (PaO2 200 mmHg), carbon dioxide abnormalities (= 45 mmHg), and the impact of their correction at day 3 on day-28 mortality and awakening, defined as a recovery of GCS > 13. Result(s): We included 995 patients with severe SAE, of whom 883 (89%) exhibited at least one early systemic insult that persisted through day 3. Compared to non-survivors, survivors had significantly less early systemic insults (hypoglycemia, hypotension, hypothermia, and anemia) within the first 48 h of ICU admission. The absence of correction of the following systemic insults at day 3 was independently associated with mortality: blood pressure (adjusted hazard ratio (aHR) = 1.77, 95% confidence interval (CI) 1.34-2.34), oxygenation (aHR = 1.78, 95% CI 1.20-2.63), temperature (aHR = 1.46, 95% CI 1.12-1.91) and glycemia (aHR = 1.41, 95% CI 1.10-1.80). Persistent abnormal blood pressure, temperature and glycemia at day 3 were associated with decreased chances of awakening. Conclusion(s): In patients with severe SAE, the persistence of systemic insults within the first three days of ICU admission is associated with increased mortality and decreased chances of awakening.Copyright © The Author(s) 2025.

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24. **The Predictive Value of Red Cell Distribution Width for the Risk of Sepsis in Patients with Acute Pancreatitis: A Retrospective Cohort Study.**

Authors: Yang C.;Cao H.;Chen S.;Ye C.;Feng Z.;Zhang H. and Xu, L.

Publication Date: 2025

Journal: Pancreas (pagination)

Abstract: Objectives: This study was to evaluate the association between red cell distribution width (RDW) and sepsis in acute pancreatitis (AP) patients, and assess its predictive value for sepsis in AP patients. Method(s): This retrospective cohort study collected patients' data from the Medical Information Mart for Intensive Care databases. Univariate and multivariate Cox models were exploited to compare the mortality within 30 days in AP patients with or without sepsis, with hazard ratios (HRs) and 95% confidence intervals (CIs) calculated. Univariate and multivariate logistic regression analyses were conducted to estimate the association, with odds ratios (ORs) and 95%CIs calculated. The

predictive value of RDW, white blood cell (WBC) sequential organ failure assessment (SOFA), SOFA+RDW, simplified acute physiology score II (SAPSII), SAPSII+RDW, bedside index of severity in acute pancreatitis (BISAP), BISAP+RDW for sepsis risk in patients with AP were evaluated by receiver operating characteristic (ROC) curve. Result(s): A total of 327 AP patients developed sepsis. The high RDW level was linked to a higher sepsis risk in patients with AP, carrying a (95% CI) of 1.10. Delong test showed that the area under the curve (AUC) of SOFA+RDW, SAPSII+RDW and BISAP+RDW scoring models were significantly greater than those of SOFA, SAPSII and BISAP scoring models, respectively (0.822 vs 0.776; 0.708 vs 0.688; 0.609 vs 0.550, respectively). Conclusion(s): RDW is not only linked to sepsis risk, but also has a certain additive effect on SOFA, SAPSII and BISAP models, among which SOFA+RDW has the highest discrimination capacity for sepsis in AP patients.

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25. **Effect of changes trajectory of serum phosphate levels on the 28-day mortality risk in patients with sepsis: a retrospective cohort study from the MIMIC-IV database.**

Authors: Zhang R. and Zhou, D.

Publication Date: 2025

Journal: BMC Infectious Diseases 25(1) (pagination), pp. Article Number: 245. Date of Publication: 01 Dec 2025

Abstract: Background: Serum phosphate levels have been reported to be linked to the prognosis in critically ill patients. The purpose of this study was to analyze the impact of the trajectory of changes in serum phosphate levels on the short-term mortality risk in patients with sepsis. Method(s): This retrospective cohort study used data on patients with sepsis from the 2008-2019 Medical Information Mart for Intensive Care IV (MIMIC-IV) database. Serum phosphate level trajectories were constructed using a latent growth mixture modeling (LGMM) based on four measurements of serum phosphate at six-hour intervals within 24 h of admission to the intensive care unit (ICU). The relationship between serum phosphate levels at ICU admission and serum phosphate level trajectories and the risk of 28-day mortality in patients with sepsis was analyzed using Cox regression models, and hazard ratio (HR) and 95% confidence interval (CI) were calculated. Result(s): Of these 1,703 patients with sepsis included, 566 (33.24%) died within 28 days. The median serum phosphate levels of the patients were 4.10 (3.00, 5.50) mg/dL. Four serum phosphate level trajectories were classified: normal-level-steady trend (trajectory 1), high-level-steady trend (trajectory 2), high-level-decreasing trend (trajectory 3), and high-level-increasing trend (trajectory 4). High serum phosphate levels at admission were associated with a higher risk of 28-day mortality (HR = 1.05, 95%CI: 1.01-1.09) in patients with sepsis. For trajectories, trajectory 2 (HR = 1.27, 95%CI: 1.05-1.54) related to an increased risk of 28-day mortality compared with trajectory 1, whereas trajectory 4 (HR = 1.69, 95%CI: 0.99-2.91, P = 0.056) may be related. There was no significant difference in 28-day mortality between patients on trajectory 3 and trajectory 1 (P = 0.280). Subgroup analyses demonstrated that patients with trajectory 2 were linked to a higher risk of 28-day mortality in different population subgroups (P Result(s): Of these 1,703 patients with sepsis included, 566 (33.24%) died within 28 days. The median serum phosphate levels of the patients were 4.10 (3.00, 5.50) mg/dL. Four serum phosphate level trajectories were classified: normal-level-steady trend (trajectory 1), high-level-steady trend (trajectory 2), high-level-decreasing trend (trajectory 3), and high-level-increasing trend (trajectory 4). High serum phosphate levels at admission were associated with a higher risk of 28-day mortality (HR = 1.05, 95%CI: 1.01-1.09) in patients with sepsis. For trajectories, trajectory 2 (HR = 1.27, 95%CI: 1.05-1.54) related to an increased risk of 28-day mortality compared with trajectory 1, whereas trajectory 4 (HR = 1.69, 95%CI: 0.99-2.91, P = 0.056) may be related. There was no significant difference in 28-day mortality between patients on trajectory 3 and trajectory 1 (P = 0.280). Subgroup analyses demonstrated that patients with trajectory 2 were linked to a higher risk of 28-day mortality in different population subgroups (P Conclusion(s): Stable trajectories of high serum phosphate levels are an important risk factor for short-term mortality in patients with sepsis.

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26. **The modified effect of mechanical ventilation setting on relationship between fluid balance and hospital mortality for sepsis patients: a retrospective study.**

Authors: Zhou D.;Lv Y.;Wang C. and Li, D.

Publication Date: 2025

Journal: BMC Anesthesiology 25(1) (pagination), pp. Article Number: 91. Date of Publication: 01 Dec 2025

Abstract: Background: Fluid supplement may be affected by ventilatory management due to physiological interaction between heart and lung. The aim of the present study was to explore the effects of ventilator strategies on the relationship of fluid balance and hospital mortality for sepsis patients. Method(s): This was a retrospective cohort study included sepsis patients with invasive mechanical ventilation (MV) over 24 h from Medical Information Mart for Intensive Care (MIMIC) IV database. The accumulative fluid balance increased by 6 h intervals were calculated as fluid intake minus fluid output. The modes (assisted or controlled) and levels (high or low) of positive end-expiratory pressure (PEEP) of MV every 6 h were recorded. The modification effect for modes and levels of PEEP on the relationship of fluid balance and hospital mortality were tested by multivariable regression models, respectively. Result(s): A total of 4466 sepsis patients with invasive MV were included, of which hospital mortality was 26.5%. Fluid balance seemed to have U-shape relationship with hospital mortality. The majority of patients used controlled ventilation at the beginning, and switched to assisted ventilation gradually; however, the PEEP level did not change a lot during the first 24 h. The relationship between fluid balance and hospital mortality was not modified by the ventilator mode; while the PEEP level may modify the relationship. Conclusion(s): For sepsis patients admitted to ICU with invasive MV, the PEEP level, but not the mode of MV, appeared to modify the relationship of fluid balance and hospital mortality. The setting of mechanical ventilation may be an important consideration for fluid therapy.Copyright © The Author(s) 2025.

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27. **Association between statin administration and outcome in patients with sepsis: A retrospective study.**

Authors: Zhou, Jianzhu;Feng, Zeying;Qiu, Hui;Li, Tong;Huang, Xin;Ye, Ling;Huang, Longjian;Guo, Chengjun;Guo, Chengxian and He, Li

Publication Date: 2025

Journal: Open Medicine 20(1), pp. 20241112

Abstract: Background & aims: There was considerable debate regarding the effect of statins administration on the outcome of septic patients. This retrospective study aimed to assess the association between statins administration and mortality in sepsis patients and investigate whether this association differed according to the types of statins. Methods: We performed a retrospective study based on the electronic ICU Collaborative Research Database, Medical Information Mart for Intensive Care Database, and the Amsterdam University Medical Centers Database. The participants with sepsis were divided as two groups, statins group and non-statins group. The primary endpoint was the all-cause mortality. We utilized logistic regression, propensity score matching (PSM), and sub-analysis to assess the association between statins administration and outcome in patients with sepsis. Results: A total of 19,327 sepsis patients were enrolled. Among these, 3,721 patients were prescribed statins. Pooled analyses of three databases showed that statin users had a decreased risk of mortality in sepsis as compared with nonusers (OR 0.73, 95% CI 0.66-0.80, P P = 0.035), whereas pravastatin, simvastatin, and rosuvastatin were not. PSM analysis confirmed these findings for statins (OR 0.75, 95% CI 0.67-0.84, P P Conclusions: The use of statins could decrease the risk of mortality in patients with sepsis during the hospital period. Among different types of statins, atorvastatin showed the most significant trend to reduce the risk of mortality in patients with sepsis. Copyright © 2025 the author(s), published by De Gruyter

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28. **Sepsis in Internal Medicine: blood culture-based subtypes, hospital outcomes, and predictive biomarkers.**

Authors: Zizzo, Gaetano;Guazzardi, Gabriele;Bompane, Daniela;Di Terlizzi, Francesco;Rotola, Giorgio;Stefani, Ilario;Medugno, Michela;Bucalo, Mario and Mazzone, Antonino

Publication Date: 2025

Journal: Frontiers in Medicine 12, pp. 1503868

Abstract: Background: Sepsis is a challenging condition increasingly managed in medical wards, however literature and clinical evidence in this hospital setting are lacking. Methods: Using the computational i2b2 framework, we retrospectively analyzed data from patients admitted to internal medicine units of four hospitals in Lombardy (Italy) between January 2012 and December 2023, with a discharge diagnosis of sepsis, septic shock, or septicemia. Results: A total of 4,375 patients were recruited. Median length of stay (LOS) was 14days, and mean ward-to-intensive care unit (ICU) transfer and in-hospital mortality rates were 11 and 26%, respectively; significant differences were observed over the years, with LOS peaks preceding mortality peaks by 1year. Blood culture-negative sepses showed shorter stays and higher mortality (acute kidney injury and fast deterioration) compared to culture-positive ones; polymicrobial sepses showed higher ICU transfer rates (acute respiratory distress); while multidrug-resistant (MDR+) and/or polymicrobial sepses showed longer stays and higher mortality (complicated course) compared to drug-sensitive or monomicrobial ones. C-reactive protein elevation predicted rapidly evolving culture-negative sepsis, whereas lower leukocyte counts predicted prolonged hospitalization; higher fractions of inspired oxygen predicted polymicrobial sepsis, while lactate elevation predicted ICU transfer; ferritin elevation and increased leukocyte counts predicted MDR+ sepsis, while further ferritin elevation and decreased platelet counts predicted death. From 2016 to 2023, MDR+ sepsis frequency declined, due to decreased resistance to several antibiotic classes, such as cephalosporins, fluoroquinolones, and aminoglycosides; however, carbapenemase- and extended-spectrum beta-lactamase-producing Gram-negative bacteria, as well as vancomycin-resistant enterococci, increased, as did the frequency of polymicrobial sepsis following the COVID-19 outbreak. Conclusion: This work provides novel insights into sepsis management in internal medicine units, highlighting the need for validated biomarkers and implemented therapies in this scenario.

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29. **Evaluation of Sepsis Severity Using Combined High-Density Lipoprotein and Red Cell Distribution Width Indicators.**

Authors: Gao Y.;Chen Y. and Gao, L.

Publication Date: 2024

Journal: British Journal of Hospital Medicine (London, England : 2005) 85(12), pp. 1–12

Abstract: Aims/Background Sepsis is a life-threatening condition resulting from dysregulated immune responses to infection, leading to organ dysfunction. High-density lipoprotein (HDL) and red cell distribution width (RDW) have shown significant correlations with sepsis severity, yet the combined prognostic value of HDL and RDW in evaluating sepsis severity and outcomes remains unclear. This study examines the relationship between HDL and RDW levels and sepsis severity, as well as evaluates the combined utility of these markers in predicting disease severity and patient outcomes. Methods This retrospective study included 103 patients diagnosed with sepsis. Clinical data, including HDL and RDW levels, were collected for analysis. Patients were divided into shock and non-shock groups based on the presence of septic shock and into survival and death groups based on 30-day in-hospital mortality. Multivariate logistic regression was used to identify factors influencing sepsis severity and prognosis, while the predictive value of HDL in combination with RDW was evaluated using receiver operating characteristic (ROC) curve analysis. Results Multivariate analysis identified sequential organ failure assessment (SOFA) score (OR = 6.566), interleukin-6 (IL-6) (OR = 2.568), HDL (OR = 0.864), and RDW (OR = 4.052) as independent predictors of sepsis severity ($p < 0.05$ for all). ROC analysis demonstrated that HDL combined with RDW yielded the highest diagnostic accuracy

for sepsis severity, with an area under curve (AUC) of 0.962, sensitivity of 97.56%, and specificity of 91.94%. Additionally, SOFA score (OR = 2.354), interleukin-6 (IL-6) (OR = 1.446), HDL (OR = 0.870), and RDW (OR = 3.502) were independent prognostic indicators ($p < 0.05$ for all). ROC analysis for prognosis showed that HDL combined with RDW had the highest predictive efficacy for the prognosis of sepsis, with an AUC of 0.922, sensitivity of 79.31%, and specificity of 93.24%. Conclusion The combination of HDL and RDW is a robust indicator for the evaluation of sepsis severity and is a valuable prognostic tool for assessing 30-day mortality risk in sepsis patients

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30. **Early prediction of sepsis in emergency department patients using various methods and scoring systems.**

Authors: Song Y.F.;Huang H.N.;Ma J.J.;Xing R.;Song Y.Q.;Li L.;Zhou J. and Ou, C. Q.

Publication Date: 2024

Journal: Nursing in Critical Care (pagination), pp. Date of Publication: 25 Oct 2024

Abstract: BACKGROUND: Early recognition of sepsis, a common life-threatening condition in intensive care units (ICUs), is beneficial for improving patient outcomes. However, most sepsis prediction models were trained and assessed in the ICU, which might not apply to emergency department (ED) settings. AIMS: To establish an early predictive model based on basic but essential information collected upon ED presentation for the follow-up diagnosis of sepsis observed in the ICU. STUDY DESIGN: This study developed and validated a reliable model of sepsis prediction among ED patients by comparing 10 different methods based on retrospective electronic health record data from the MIMIC-IV database. In-ICU sepsis was identified as the primary outcome. The potential predictors encompassed baseline demographics, vital signs, pain scale, chief complaints and Emergency Severity Index (ESI). 80% and 20% of the total of 425 737 ED visit records were randomly selected for the train set and the test set for model development and validation, respectively. RESULT(S): Among the methods evaluated, XGBoost demonstrated an optimal predictive performance with an area under the curve (AUC) of 0.90 (95% CI: 0.90-0.91). Logistic regression exhibited a comparable predictive ability to XGBoost, with an AUC of 0.89 (95% CI: 0.89-0.90), along with a sensitivity and specificity of 85% (95% CI: 0.83-0.86) and 78% (95% CI: 0.77-0.80), respectively. Neither of the five commonly used severity scoring systems demonstrated satisfactory performance for sepsis prediction. The predictive ability of using ESI as the sole predictor (AUC: 0.79, 95% CI: 0.78-0.80) was also inferior to the model integrating ESI and other basic information. CONCLUSION(S): The use of ESI combined with basic clinical information upon ED presentation accurately predicted sepsis among ED patients, strengthening its application in ED. RELEVANCE TO CLINICAL PRACTICE: The proposed model may assist nurses in risk stratification management and prioritize interventions for potential sepsis patients, even in low-resource settings.

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31. **Mediating Role of Platelet Count Increase in Unfractionated Heparin Treatment for Sepsis Patients: A Retrospective Cohort Analysis.**

Authors: Wang G.;Zou X.;Shen J.;Hao C.;Chen G.;Sun Y.;Zhang Y.;An Y. and Zhao, H.

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Journal: British Journal of Hospital Medicine (London, England : 2005) 85(12), pp. 1–17

Abstract: Aims/Background The role of heparin in sepsis therapy has been widely debated. The controversy surrounding heparin's use as an anticoagulant in sepsis may stem from differences in sepsis definitions, study designs, timing and dosage of drug administration, treatment duration, complications, and patient severity. In this study, we aimed to determine the optimal timing and dosage of heparin in patients with sepsis, identify specific subgroups that could benefit from heparin therapy, and explore laboratory markers to assess its efficacy. Methods This retrospective cohort study was conducted using the Medical Information Mart for Intensive Care-IV dataset. Data from patients with sepsis were extracted based on the Sepsis 3.0 criteria. Patients were categorized according to heparin

use. The effectiveness of early and appropriate heparin administration was assessed, and a subgroup analysis was performed to identify patients most likely to benefit from heparin therapy. Additionally, factors mediating the improvement in sepsis prognosis following heparin treatment were analyzed. Results We recruited 4149 participants who met the inclusion criteria, with an overall 28-day mortality rate of 19.5%. There were 2192 individuals in the heparin group and 1957 in the non-heparin group. After propensity score matching, heparin therapy demonstrated a significantly greater effect on reducing both 28-day and 90-day mortality compared to the non-heparin treatment (18.1% vs. 10.7%, $p < 0.001$; 18.8% vs. 12.6%, $p < 0.001$). However, the heparin group had a higher incidence of major bleeding (10.9% vs. 6.3%, $p = 0.001$), increased use of mechanical ventilation (54.3% vs. 45.1%, $p < 0.001$), and a longer intensive care unit stay (3.6 vs. 2.5 days, $p < 0.001$) compared to the non-heparin group. Early administration of high-dose heparin improved 28-day survival. Early and adequate heparin administration was more effective than late and insufficient dosing ($p < 0.01$), except in patients with sepsis who had low white blood cell counts, alkalosis, or reduced platelet counts. The increase in platelet count had a significant mediating effect on the entire cohort ($p < 0.001$ for the causal mediation effect), with a mediation proportion of 14%. Conclusion Early and adequate heparin administration can significantly improve the prognosis of sepsis. An increase in platelet count may serve as a potential indicator of the effectiveness of heparin therapy in sepsis.

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32. **Association between platelet count and 30-day in-hospital mortality among intensive care unit patients with sepsis: a multicenter retrospective cohort study.**

Authors: Wang J.;Zhou P.;Li X.;Zhou L. and Deng, Z.

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Abstract: Background: The relationship between platelet count and sepsis outcomes in intensive care units (ICUs) requires comprehensive investigation through large-scale multicenter studies. Method(s): In this multicenter retrospective cohort study, we analyzed 17,977 sepsis patients from 208U.S. hospitals (2014-2015) using the eICU Collaborative Research Database v2.0. Analyses were adjusted for demographics, clinical parameters, comorbidities, and treatments. Generalized additive models and two-piecewise linear regression were used to assess the relationship between platelet count and mortality. Result(s): A U-shaped relationship was identified with an inflection point at 176x10/L. Below this threshold, each 10x10/L increase in platelet count was associated with a 6% decrease in mortality risk (adjusted OR 0.94, 95% CI 0.93-0.95, pResult(s): A U-shaped relationship was identified with an inflection point at 176x10/L. Below this threshold, each 10x10/L increase in platelet count was associated with a 6% decrease in mortality risk (adjusted OR 0.94, 95% CI 0.93-0.95, pConclusion(s): This large-scale, multicenter retrospective study has made a significant contribution to understanding the association between platelet count and mortality in patients with sepsis in intensive care units. We identified a critical threshold of 176x109/L for platelet count and demonstrated a distinct U-shaped relationship with 30-day in-hospital mortality, providing valuable reference criteria for clinical risk stratification.

Sources Used:

The following databases are used in the creation of this bulletin: EMBASE and Medline.

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