

Here is the latest edition of the Sepsis Bulletin. The bulletin covers the latest information on sepsis and comes out fortnightly. Next edition is due 12 July 2019. Older editions are available as pdfs on the Keeping Up To Date library guide ([http://libguides.bodleian.ox.ac.uk/Keeping\\_up\\_to\\_date](http://libguides.bodleian.ox.ac.uk/Keeping_up_to_date))

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## SEPSIS BULLETIN

### 28 June 2019

#### Neonatal, paediatric and maternal sepsis

[A National Survey of Resources to Address Sepsis in Children in Tertiary Care Centers in Nigeria.](#)

Nwankwor OC et al

**Front Pediatr.** 2019 Jun 11;7:234.

Background: Infections leading to sepsis are major contributors to mortality and morbidity in children world-wide. Determining the capacity of pediatric hospitals in Nigeria to manage sepsis establishes an important baseline for quality-improvement interventions and resource allocations. Certain sepsis-related interventions were reportedly widespread, however, there is no standardized sepsis protocol, and majority of the hospitals do not have pediatric intensive care units (PICU). These findings could guide quality improvement measures at institutional level, and healthcare policy/spending at the national level.

#### Adult sepsis (cont.)

[A case series of endemic infections associated hemophagocytic lymphohistiocytosis \(HLH\) mimicking severe sepsis syndrome](#)

Kollipara V. et al

**Respir Med Case Rep.** 2019 May 14;27:100854.

Hemophagocytic lymphohistiocytosis (HLH) is associated to high mortality and morbidity. A condition often underrecognized, HLH should be in the differential diagnosis of patients presenting with fever, cytopenia, hypertriglyceridemia and high ferritin levels (>500 µg/L). Acquired or secondary HLH in adults is a heterogenous disease triggered by infectious, autoimmune, or neoplastic conditions. Infection associated HLH (IAHS) have been described in association to immunodeficiency and secondary to infections with endemic pathogens. Extensive investigation with microbiology, serology, urine antigens and biopsies

[Transfer hospitalizations for pediatric severe sepsis or septic shock: resource use and outcomes](#)

Odetola, F.O. et al

**BMC pediatrics**, 13 June 2019, Vol.19(1), pp.196

Sepsis is a major cause of child mortality and morbidity. To enhance outcomes, children with severe sepsis or septic shock often require escalated care for organ support, sometimes necessitating interhospital transfer. The association between transfer admission for the care of pediatric severe sepsis or septic shock and in-hospital patient survival and resource use is poorly understood. One in four children with severe sepsis or septic shock required interhospital transfer for specialized care associated with greater use of invasive medical devices and specialized technology. Despite higher crude mortality and resource consumption among transferred children, adjusted mortality and resource use did not differ by transfer status. Further research should identify quality-of-care factors at the receiving hospitals that influence clinical outcomes and resource use.

[Use of a Modified Early-Onset Sepsis Risk Calculator for Neonates Exposed to Chorioamnionitis](#)

Sloane, A.J. et al

**The Journal of pediatrics**, 14 June 2019

To validate the recently modified Kaiser Permanente early-onset sepsis (EOS) calculator with a higher baseline incidence in chorioamnionitis exposed neonates. When using an EOS risk of 4 of 1000 in infants exposed to mothers with chorioamnionitis, the EOS calculator has the ability to capture an increased number of neonates with culture-positive EOS. However, this change also leads to nearly a 3-fold increase in the use of empiric antibiotics and an evaluation with blood culture in almost all infants born to mothers with chorioamnionitis.

[Therapeutic value of Vitamin D as an adjuvant therapy in neonates with sepsis.](#)

Hagag AA, et al.

**Infect Disord Drug Targets**. 2019 Jun 26.

Sepsis is an unusual systemic reaction to what is sometimes an otherwise ordinary infection, and it probably represents a pattern of response by the immune system to injury. Vitamin D is a fat-soluble steroid hormone that contributes to the maintenance of normal calcium homeostasis and skeletal mineralization. Vitamin D has an important role in the regulation of both innate and adaptive immune

of the bone marrow, lung or lymph nodes are often necessary. We present a series of three adult cases of HLH in patients admitted to the intensive care unit with a presumptive diagnosis of sepsis. Early recognition and treatment of this infection sometimes with concomitant administration of immunosuppressant therapy could impact the high mortality associated to this overlap syndrome.

[Kinase activity is impaired in neutrophils of sepsis patients.](#)

Hoogendijk AJ et al

**Haematologica**. 2019 Jun;104(6):e233-e235.

Sepsis is a complex clinical condition that arises from multiple interacting tissues and unbalanced cell-specific host response mechanisms. Neutrophils are the most abundant circulating leukocytes and form the primary line of defense against pathogens.<sup>2</sup> Upon activation and subsequent extravasation, neutrophils can engage pathogens by a broad set of actions, including phagocytosis, production of reactive oxygen species, release of antimicrobial peptides and by undergoing NETosis.<sup>3</sup> Kinases play an integral role in regulating and enabling intracellular signaling cascades that control these, for neutrophil function. However, knowledge on kinome-wide regulation of kinases in primary neutrophils during sepsis and critical illness is limited. Using a kinome profiling approach we here uncover that, relative to patients with non-infectious critical illness, sepsis patients present a suppressed neutrophil kinase activity profile

[Accuracy of intercellular adhesion molecule-1 for diagnosing sepsis: A systematic review and meta-analysis protocol.](#)

Li XJ1, et al

**Medicine (Baltimore)**. 2019 Jun;98(24):e16019.

Sepsis is a complex and life-threatening systemic disease. A positive blood culture is the criterion standard of diagnosis for sepsis; however, it does not produce results for 24 to 72 hours. Besides, the clinical manifestations of sepsis are variable and nonspecific. Therefore, a new diagnostic biomarker for diagnosis of sepsis should be developed. The present study aims to assess the diagnostic value of intercellular adhesion molecule-1 (ICAM-1) in individuals with sepsis. The evidence will indicate that ICAM-1 is a valuable biomarker for detecting sepsis. This is a protocol of systematic review and

systems. Serum 25 (OH) vitamin D levels of neonates with early onset neonatal sepsis were significantly lower than healthy controls. Vitamin D supplementation improved sepsis score and decrease high levels of hs-CRP; this reflects the role of vitamin D as a target therapy for neonatal sepsis. Further studies are warranted to confirm the therapeutic value of vitamin D in neonatal sepsis.

[Can Early Changes in Vital signs Predict Duration of Antibiotic Therapy in Suspected Neonatal Sepsis?](#)

McGovern M, et al

**Ir Med J.** 2019 Apr 11;112(4):909.

Suspected sepsis remains a leading causes of Neonatal Intensive Care Unit admission, with infants often receiving 48-72 hours of empirical antibiotic therapy. Early in treatment it is difficult to predict infants who will require prolonged antibiotic therapy. Our aim was to assess if vital sign measurements in the initial period of treatment can predict those neonates requiring prolonged antibiotic therapy in term and late-preterm infants. Respiratory rate shows a weak positive correlation with antibiotic duration. Infants requiring prolonged therapy were more likely to have abnormal vital signs 12 hours after initiating antibiotic therapy. Changes in vital signs maybe useful in detecting infants who will require prolonged antibiotic therapy.

[Acute Funisitis Correlates With the Risk of Early-Onset Sepsis in Term Newborns Assessed Using the Kaiser Sepsis Calculator.](#)

Ji H, et al

**Pediatr Dev Pathol.** 2019 Jun 5:1093526619855467.

The risk of neonatal early-onset sepsis (EOS) is traditionally assessed on maternal signs of clinical chorioamnionitis. Recently, an online EOS risk calculator was developed by Kaiser Permanente using maternal and neonatal clinical parameters. We were interested in whether an increased Kaiser sepsis risk score correlates with histologic acute chorioamnionitis or acute funisitis. Our study provides histological evidence to support that the Kaiser Sepsis Calculator may help to effectively reduce unwarranted blood culture, antibiotics exposure, and neonatal intensive care unit admission in term neonates.

[Soluble CD14 subtype \(sCD14-ST\) as biomarker in neonatal early-onset sepsis and late-onset sepsis: a systematic review and meta-analysis.](#)

van Maldeghem I et al

meta-analysis, so the ethical approval and patient consent are not required.

[Use of the National Early Warning Score \(NEWS\) to Identify Acutely Deteriorating Patients with Sepsis in Acute Medical Ward](#)

Lim, W.T. et al.

**Ann Acad Med Singapore.** 2019 May;48(5):145-149.

The National Early Warning Score (NEWS) is well established in acute medical units to identify acutely deteriorating patients and is shown to have good prognostic value. NEWS, however, has only been used in the Emergency Department as a triage tool. We aimed to evaluate the validity of NEWS in Acute Medical Ward (AMW) that treats predominantly acute infection-related conditions to the Internal Medicine service. NEWS accurately triages patients according to the likelihood of adverse outcomes in infection-related acute medical settings.

[Frequency and mortality of septic shock in Europe and North America: a systematic review and meta-analysis.](#)

Vincent JL et al

**Crit Care.** 2019 May 31;23(1):196.

Septic shock is the most severe form of sepsis, in which profound underlying abnormalities in circulatory and cellular/metabolic parameters lead to substantially increased mortality. A clear understanding and up-to-date assessment of the burden and epidemiology of septic shock are needed to help guide resource allocation and thus ultimately improve patient care. The aim of this systematic review and meta-analysis was therefore to provide a recent evaluation of the frequency of septic shock in intensive care units (ICUs) and associated ICU and hospital mortality. Our literature review reaffirms the continued common occurrence of septic shock and estimates a high mortality of around 38%. The high level of heterogeneity observed in this review may be driven by variability in defining and applying the diagnostic criteria, as well as differences in treatment and care across settings and countries.

[Importance of diastolic arterial pressure in septic shock: PRO](#)

Hamzaoui, O. et al

**BMC Immunol.** 2019 Jun 3;20(1):17

Early diagnosis of bacterial sepsis in neonates is hampered by non-specific symptoms and the lack of rapid responding laboratory measures. The biomarker soluble CD14 subtype (sCD14-ST) seems promising in the diagnostic process of neonatal sepsis. In order to evaluate the differences in diagnostic accuracy of sCD14-ST between early onset sepsis (EOS) and late onset sepsis (LOS) we assessed this systematic review and meta-analysis. sCD14-ST is a promising and rapid-responding diagnostic biomarker for EOS and LOS. The difference in pooled means between EOS and LOS underlines the importance to consider EOS and LOS as two different disease entities, requiring separate analysis in original articles and systematic reviews.

[Cord blood procalcitonin level and early-onset sepsis in extremely preterm infants.](#)

Frerot A et al

**Eur J Clin Microbiol Infect Dis.** 2019 Jun 1.

Early-onset neonatal sepsis (EOS) is observed in 1.7% of extremely preterm infants, with high morbidity and mortality rate. Cord blood procalcitonin (PCT) is a sensitive marker of EOS in full-term newborns, but it has been rarely studied in premature infants. This study of the diagnostic value of cord blood PCT by immunofluorescence has been assessed as an early marker of EOS in a prospective cohort of extremely preterm infants, with a threshold at 0.5 µg/L. Cord blood PCT is a marker significantly associated with EOS in extremely preterm infants, but its sensitivity remains low. Its added value in combination with other early marker of EOS needs to be further investigated in this high-risk population.

[Pain Sensitization, Breastfeeding Effectiveness, and Parental Preferences by Antibiotic Route in Suspected Neonatal Sepsis.](#)

Patel L et al

**Hosp Pediatr.** 2019 Jun;9(6):464-467.

Intravenous (IV) and intramuscular (IM) antibiotics have comparable efficacy in treating neonates undergoing sepsis evaluations. There are no clinical data favoring the use of either route regarding newborn pain and parental preferences. We hypothesized that pain associated with IM injections would worsen breastfeeding effectiveness and decrease parental satisfaction, making IV catheters the preferred route. IM antibiotics in newborns are associated with pain sensitization and greater pain than IV dosing. Despite

**Journal of Critical Care;** Jun 2019; vol. 51 ; p. 238

Along with heart rate, the arterial blood pressure is the most commonly used variable to assess the cardiovascular status in the general population. Physicians caring patients with chronic hypertension are well aware of the necessity to target a very tight safe range of diastolic arterial pressure (DAP), when using anti-hypertensive drugs. We believe that the DAP as a marker of arterial tone and as the upstream pressure for the left ventricular perfusion, is as an important variable to be considered in patients with septic shock. Since the DAP is easily obtained in such patients using an arterial catheter, it would be regrettable not to consider it, in particular to identify situations of low arterial tone, where initiation of a vasopressor may be urgent.

[Lung nitroxidative stress in mechanically-ventilated septic patients: A pilot study](#)

Gorrasi, J. et al

**Journal of Critical Care;** Jun 2019; vol. 51 ; p. 204

During sepsis and mechanical ventilation oxidative stress is generated by endothelial and inflammatory lung cells. Our main objective was to study pulmonary NO (nitric oxide) production and nitroxidative stress in mechanically-ventilated septic patients. We conclude that during early phases of sepsis there is an enhanced lung nitroxidative stress due to an increase of NO production leading to secondary NO-derived oxidants, which promote protein nitration and lipid peroxidation.

[Relationship of glucose-6-phosphate dehydrogenase deficiency and neonatal sepsis: a single-center investigation on the major cause of neonatal morbidity and mortality.](#)

Zekavat OR et al

**Pediatric Health Med Ther.** 2019 Apr 11;10:33-37.

Neonatal sepsis is a serious disease with distinct clinical and laboratory findings. G6PD deficiency is known as the most common human erythrocyte-enzyme deficiency. This study was designed to investigate the relationship between G6PD deficiency and neonatal sepsis, since it is a major cause of neonatal morbidity and mortality. Our study showed higher incidence of G6PD deficiency in neonates who had been admitted due to sepsis.

accurately recognizing newborn pain with the IM route, parents preferred this to the IV route, which was perceived to interfere with breastfeeding and bonding.

[Is neutrophil CD11b a special marker for the early diagnosis of sepsis in neonates? A systematic review and meta-analysis.](#)

Qiu X, et al

**BMJ Open.** 2019 May 1;9(4):e025222.

Our study aimed to synthesise and analyse the early diagnostic value of neutrophil CD11b (nCD11b) for neonatal sepsis. The present evidence indicated that nCD11b is a promising biomarker for the early diagnosis of neonatal sepsis.

[Maternal sepsis is an evolving challenge.](#)

Turner MJ.

**Int J Gynaecol Obstet.** 2019 Jul;146(1):39-42.

Despite major advances in the last century, particularly in high resource settings, maternal sepsis remains a common and potentially preventable cause of direct maternal death globally. A barrier to further progress has been the lack of consensus on the definition of maternal sepsis. Publications from two recent multidisciplinary consensus conferences, one on sepsis in the non-pregnant adult and the other on sepsis in the pregnant woman, concluded that the criteria for diagnosing sepsis should be clinically-based, applicable at the bedside, and should not be laboratory-based. Standardizing the criteria for maternal sepsis optimizes clinical audit and research. It may facilitate the evaluation of the role of different clinical parameters and biomarkers in the diagnosis, earlier recognition and management of maternal infection and sepsis. Further work is required to develop an international consensus on the criteria for diagnosing maternal sepsis and any associated organ dysfunction.

**Adult sepsis**

[Serum albumin as a risk factor for death in patients with prolonged sepsis: An observational study](#)

Takegawa, R. et al

**Journal of Critical Care;** Jun 2019; vol. 51 ; p. 139

The aim of this study was to evaluate an association between nutritional biomarkers and prognosis in septic patients. We retrospectively searched the association between nutritional biomarkers including serum albumin (Alb), total protein (TP), total cholesterol (T-chol), and cholinesterase (ChE), and prognosis for septic

We suggest quantitative G6PD-level assessment instead of the routine qualitative methods in prevalent G6PD deficiency. It is also recommended that neonates with G6PD deficiency be under close supervision during the first month of life, especially those with other risks of neonatal sepsis, such as prematurity or low birth weight.

[Neonatal Vitamin D status and the risk of neonatal sepsis.](#)

Ozdemir AA, Cag Y.

**Pak J Med Sci.** 2019 Mar-Apr;35(2):420-425

The study aims to evaluate the maternal and neonatal 25-hydroxyvitamin D [25(OH)D] levels and the effect of 25(OH)D levels on the development of neonatal sepsis. Our findings suggest that there may be an association between vitamin D deficiency and neonatal sepsis.

[Role of Vitamin-D Deficiency in Term Neonates with Late-Onset Sepsis: A Case-Control Study.](#)

Agrawal A et al

**J Trop Pediatr.** 2019 Apr 21. pii: fmz021

To find the relationship between vitamin-D levels and late-onset sepsis (LOS) in term neonates. This study shows that vitamin-D deficiency in term neonates may predispose them to LOS.

[Enteral lactoferrin for the treatment of sepsis and necrotizing enterocolitis in neonates.](#)

Pammi M, Abrams SA.

**Cochrane Database Syst Rev.** 2019 May 11;5:CD007138.

Neonatal sepsis and necrotizing enterocolitis (NEC) cause significant neonatal mortality and morbidity despite appropriate antibiotic therapy. Enhancing host defense and modulating inflammation by using lactoferrin as an adjunct to antibiotics in the treatment of sepsis, NEC, or both, may improve clinical outcomes. The primary objective was to assess safety and efficacy of oral lactoferrin as an adjunct to antibiotics in the treatment of neonates with suspected or confirmed sepsis, NEC, or both. Implications for practice: currently there is no evidence to support or refute the use of enteral lactoferrin, as an adjunct to antibiotic therapy, for the treatment of neonatal sepsis or necrotizing enterocolitis.

patients treated in the ICU for >7 days. We found that the changes in serial data of the nutritional markers of Alb, TP, T-chol, and ChE reflected the higher risk of death in patients with prolonged sepsis.

[The nitric oxide pathway antagonists in septic shock: Meta-analysis of controlled clinical trials](#)

Pascual-Ramirez, J. et al

**Journal of Critical Care**; Jun 2019; vol. 51 ; p. 34

Nitric oxide antagonists are effective to reverse hypotension and septic shock. Nitric oxide antagonists decrease survival rate. Nitric oxide antagonists increase number of adverse effects and length of stay in the ICU. Our intention was to obtain a quantitative summary of these diverse antagonistic agent effects along the NO pathway using the available clinical trials. New drugs RCTs have systematically failed to prove a benefit in septic shock patient survival. Small trials often times suggest possible advantages that are denied by confirmatory larger trials. The absence of a prior power analysis by the small studies could be the explanation for these contradictory results. Nitric oxide production has been associated to hypotension resistant to fluid resuscitation and ultimately multiple organ dysfunction. Non-selective opposition to NO production or to its effects has not resulted in improved long-term outcome and survival despite the fact blood pressure is improved in the short-term. Several explanations can be offered for such adverse outcome.

[PRagMatic Pediatric Trial of Balanced versus nOrmal Saline FLUID in Sepsis: the PRoMPT BOLUS Randomized Controlled Trial Pilot Feasibility Study.](#)

Balamuth F. et al

**Acad Emerg Med**. 2019 Jun 10.

Resuscitation with crystalloid fluid is a cornerstone of pediatric septic shock treatment. However, the optimal type of crystalloid fluid is unknown. We aimed to determine the feasibility of conducting a pragmatic randomized trial to compare balanced (lactated Ringer's [LR]) with 0.9% normal saline (NS) fluid resuscitation in children with suspected septic shock. A pragmatic study design proved feasible to study comparative effectiveness of LR versus NS fluid resuscitation for pediatric septic shock.

[Brain Volume Changes in Patients with Acute Brain Dysfunction Due to Sepsis.](#)

Orhun G. et al

**Neurocrit Care**. 2019 Jun 11.

[Future Challenges in Pediatric and Neonatal Sepsis: Emerging Pathogens and Antimicrobial Resistance.](#)

Folgori L, Bielicki J.

**J Pediatr Intensive Care**. 2019 Mar;8(1):17-24.

The incidence of severe infections caused by multidrug-resistant (MDR) pathogens is currently rising worldwide, and increasing numbers of neonates and children with serious bloodstream infections due to resistant bacteria are being reported. Severe sepsis and septic shock due to gram-negative bacteria represent a significant cause of morbidity and mortality, and contribute to high health care costs. Antimicrobial resistance among Enterobacteriaceae represents a major problem in both health care-associated and community-acquired infections, with extended-spectrum  $\beta$ -lactamases (ESBLs) and carbapenem-resistant Enterobacteriaceae (CRE) now presenting the main threat. These infections in adult populations have been associated with poor clinical outcomes, but very limited data have been published so far about risk factors and clinical outcome of ESBL-associated and CRE sepsis in the pediatric population. The treatment of these infections in neonates and children is particularly challenging due to the limited number of available effective antimicrobials. Evidence-based use of new and older antibiotics based on both strategic and regulatory clinical trials is paramount to improve management of these severe infections in neonates and children.

[Effects of mean arterial pressure on arousal in sedated ventilated patients with septic shock: a SEPSISPAM post hoc exploratory study](#)

by Youenn Jouan et al

**Annals of Intensive Care** 2019;54 (2019)

It is unknown whether the recommended mean arterial pressure (MAP) target of 65 mmHg during initial resuscitation of septic shock is sufficient to maintain cerebral perfusion. Thus, we tested the hypothesis that a higher MAP target in patients with septic shock may improve level of arousal. In patients with septic shock who were mechanically ventilated and sedated, resuscitation with MAP target between 80 and 85 mmHg was associated with higher arousal level as compared to a MAP target between 65 and 70 mmHg.

Sepsis-induced brain dysfunction (SIBD) is often encountered in sepsis patients and is related to increased morbidity. No specific tests are available for SIBD, and neuroimaging findings are often normal. In this study, our aim was to analyze the diagnostic value of volumetric analysis of the brain structures and to find out its significance as a prognostic measure. Volumetric analysis of the brain appears to be a sensitive measure of volumetric changes in SIBD. Volume reduction in specific deep gray matter regions might be an indicator of unfavorable outcome.

[The increase of sepsis-related mortality in Italy: a nationwide study, 2003-2015.](#)

Grande E. et al

**Eur J Clin Microbiol Infect Dis.** 2019 Jun 11.

The true burden of sepsis is largely unknown. Conventional underlying cause of death (UCoD) statistics largely underestimate sepsis-related mortality. This study aims to analyze all the conditions mentioned in the death certificates (multiple causes of death-MCoD) to estimate the nationwide burden of sepsis-related mortality in Italy, to investigate time trends and main comorbidities in sepsis-related deaths. The increased awareness within the medical community in addition to the growing susceptible elderly population and the spread of antimicrobial resistance could have contributed to the sepsis-related mortality increase. MCoD statistics could help in recognizing sepsis not only as a clinical challenge, but also as a major public health issue.

[Lactate, bicarbonate and anion gap for evaluation of patients presenting with sepsis to the emergency department: A prospective cohort study](#)

Mitra, B. et al

**Emergency medicine Australasia** : EMA, 11 June 2019

A serum lactate level >2 mmol/L has been chosen as the preferred cut-off value for screening of patients with suspected sepsis. In patients with suspected sepsis presenting to the ED, we aimed to determine the outcomes of patients with initial lactate levels ≤2 mmol/L, but abnormal bicarbonate or anion gaps (AGs). A normal lactate level alone should not be used to exclude life-threatening sepsis. Patients with metabolic acidosis characterised by low bicarbonate or high AG levels, but with normal lactate levels, have high rates of ICU requirement and mortality and should also be considered for early, aggressive therapy.

[Sepsis early warning scoring systems: The ideal tool remains elusive!](#)

Postelnicu, R. et al

**Journal of Critical Care**; Aug 2019; vol. 52 ; p. 251

Sepsis is one of the most common reasons for hospitalization. Early diagnosis and intervention are essential to improve patient outcomes from sepsis. The Surviving Sepsis Campaign is focused on raising sepsis awareness and decreasing sepsis-related mortality, yet early recognition and treatment of sepsis remains challenging. Physiologic derangement often precedes the recognition of clinical deterioration, and this concept has led to the development of diagnostic tools to accurately identify patients with sepsis or those at high risk for decompensation. Some early warning scoring systems (EWS) have been developed which have utility in screening patients with abnormal physiologic signs, while others can play a role in risk stratification. Unfortunately, sepsis remains a complex syndrome with no gold standard for its detection.

[Inflammatory anemia-associated parameters are related to 28-day mortality in patients with sepsis admitted to the ICU: a preliminary observational study.](#)

Jiang Y. et al

**Ann Intensive Care.** 2019 Jun 10;9(1):67.

Anemia is one of the most common complications of sepsis. Sepsis-related anemia is associated mainly with inflammation. We aimed to observe the changes in the inflammatory anemia-associated parameters of patients with sepsis in the early stage of intensive care unit (ICU) admission and to evaluate their association with 28-day mortality. Inflammatory anemia-associated parameters changed significantly in patients with sepsis in the first week of ICU admission. Plasma EPO, hepcidin, ferritin, IL-6, sTfR/log ferritin, the RDW and SOFA score were associated significantly with 28-day mortality. Plasma hepcidin might have a superior predictive value, with high specificity, compared with other inflammatory anemia-associated parameters for 28-day mortality of sepsis patients in the ICU.

[Sepsis in the era of data-driven medicine: personalizing risks, diagnoses, treatments and prognoses](#)

### [Sepsis: Noninvasive Assessment](#)

Flynn Makic, M.B.

**Journal of perianesthesia nursing**, 13 June 2019

Early recognition and treatment of patients with sepsis remains essential to improving outcomes. Interventions focus on identifying and treating the source of the infection and supporting the patient's tissue perfusion through fluid resuscitation. Both invasive and noninvasive assessments can be used to evaluate tissue perfusion and often less invasive techniques are often overlooked. Incorporating noninvasive assessment techniques can assist the perianesthesia nurse in gathering data to evaluate the patient's response to treatment.

### [Effect of do-not-resuscitate orders on patients with sepsis in the medical intensive care unit: a retrospective, observational and propensity score-matched study in a tertiary referral hospital in Taiwan](#)

Chang, Y-C. et al

**BMJ open**, 16 June 2019, Vol.9(6), pp.e029041

The aim of this study was to determine whether do-not-resuscitate (DNR) orders affect outcomes in patients with sepsis admitted to intensive care unit (ICU). DNR orders may predict worse outcomes for patients with sepsis admitted to medical ICUs. The survival rate in the early-DNR order group was not inferior to the late-DNR order group.

### [Downregulation of JKAP is correlated with elevated disease risk, advanced disease severity, higher inflammation, and poor survival in sepsis](#)

Zhao, Min ; Huang, Xing

**Journal of clinical laboratory analysis**, 17 June 2019, pp.e22945

This study aimed to explore the association of JKAP with sepsis risk and investigate its correlation with disease severity, inflammatory cytokines, and survival in sepsis patients. JNK pathway-associated phosphatase is of good value in predicting lower sepsis risk, and its downregulation correlates with advanced disease severity, higher level of systemic inflammation, and poor survival in sepsis patients.

### [Aetiology and outcomes of sepsis in adults in sub-Saharan Africa: a systematic review and meta-analysis](#)

Lewis, J.M. et al

**Critical Care**, 2019, Vol.23

Aetiology and outcomes of sepsis in sub-Saharan Africa (sSA) are poorly described; we performed a systematic

Liu, Andrew C et al

**Briefings in bioinformatics**, 11 June 2019

Sepsis is a series of clinical syndromes caused by the immunological response to infection. The clinical evidence for sepsis could typically attribute to bacterial infection or bacterial endotoxins, but infections due to viruses, fungi or parasites could also lead to sepsis. Regardless of the etiology, rapid clinical deterioration, prolonged stay in intensive care units and high risk for mortality correlate with the incidence of sepsis. Despite its prevalence and morbidity, improvement in sepsis outcomes has remained limited. In this comprehensive review, we summarize the current landscape of risk estimation, diagnosis, treatment and prognosis strategies in the setting of sepsis and discuss future challenges. We argue that the advent of modern technologies such as in-depth molecular profiling, biomedical big data and machine intelligence methods will augment the treatment and prevention of sepsis. The volume, variety, veracity and velocity of heterogeneous data generated as part of healthcare delivery and recent advances in biotechnology-driven therapeutics and companion diagnostics may provide a new wave of approaches to identify the most at-risk sepsis patients and reduce the symptom burden in patients within shorter turnaround times. Developing novel therapies by leveraging modern drug discovery strategies including computational drug repositioning, cell and gene-therapy, clustered regularly interspaced short palindromic repeats - based genetic editing systems, immunotherapy, microbiome restoration, nanomaterial-based therapy and phage therapy may help to develop treatments to target sepsis.

### [Successful prospective quality improvement programme for the identification and management of patients at risk of sepsis in hospital](#)

Gallagher, Kevin et al

**BMJ Open Quality**, 11 June 2019, Vol.8(2)

This audit aimed to improve the speed and completeness of delivery of treatment to urology patients at risk of sepsis in the hospital. Patients were prospectively included if they developed a new-onset systemic inflammatory response syndrome, were reviewed by a doctor who thought this was due to infection and prescribed antibiotics. We measured median time to antibiotic administration (TTABx) as the primary outcome.



review and meta-analysis to summarise the available data. Sepsis in sSA is dominated by HIV and tuberculosis, with poor outcomes. Optimal antimicrobial strategies, including the role of tuberculosis treatment, are unclear. Long-term outcome data are lacking. Standardised sepsis diagnostic criteria that are easily applied in low-resource settings are needed to establish an evidence base for sepsis management in sSA.

Factors associated with delays in management were identified, targeted quality improvement interventions implemented and then reaudited. A period of baseline prospective study, followed by tailored quality improvement initiatives, can significantly improve the speed and quality of sepsis management for inpatients on an acute hospital ward.

[Sepsis: personalization v protocolization?](#)

Singer, Mervyn

**Critical care (London, England)**, 14 June 2019, Vol.23(Suppl 1), pp.127

The founding tenet of evidence-based medicine is to combine best evidence with clinical expertise. As David Sackett opined 'Without clinical expertise, practice risks becoming tyrannised by evidence'. Rigid protocols and mandates, based on an inconclusive and low-level evidence base, cannot suit the physiological, biochemical and biological heterogeneity displayed by the individual septic patient. Indeed, clear proof of outcome benefit through adoption of an inflexible management approach is lacking and will certainly be detrimental to some. Therapy thus needs to be tailored to meet the individual patient's needs. The same principle should be applied to clinical trials; the continued disappointments of multiple investigational strategies trialled over three decades, despite (often) a sound biological rationale, suggest a repeated methodological failure that does not account for the marked heterogeneity within the septic patient's biological phenotype and thus marked variation in their host response. The increasing availability of rapid point-of-care diagnostics and theranostics should facilitate better patient selection and titrated optimization of the therapeutic intervention.

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