

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 07 February 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

24 January 2019

### Neonatal, paediatric and maternal sepsis

[Evaluation of systemic inflammatory response syndrome-negative sepsis from a Chinese regional pediatric network](#)

Wang, Y. et al

**BMC Pediatrics**, 12/2019, Vol.19(1)

The identification of sepsis in children varies depending on the definition used. Our purpose was to compare clinical data and outcome of atypical sepsis, manifested as having sepsis but not fulfilling the criteria of systemic inflammatory response syndrome (SIRS-negative sepsis, SNS), in children based on the modified Angus criteria with those of sepsis (S) and severe sepsis (SS) based on the international consensus criteria. SNS differed from SS in that it predominantly affected infants and manifested with cardiopulmonary and neurologic dysfunction. There were no laboratory variables which were useful in identification of SNS, or predicting response to therapy or outcome.

### Adult sepsis (cont.)

[Early, Nurse-Directed Sepsis Care](#)

Ferguson, A. ET AL

**AJN, American Journal of Nursing**, 2019, Vol.119(1), pp.52-58

Sepsis is one of the leading causes of hospital mortality and readmission. For the past 20 years, sepsis research has focused on best practices for treating patients with the most severe manifestations of sepsis, while the treatment of patients outside of critical care or ED settings, who have early or less severe signs and symptoms of sepsis, have received little attention. This project demonstrates that using nurse-directed care to promote timely identification and early treatment of sepsis in the ED and in inpatient settings can improve bundle adherence and reduce in-hospital sepsis-related mortality rates.

[Sepsis associated acute kidney injury](#)

[Interventions for Pediatric Sepsis and Their Impact on Outcomes: A Brief Review](#)

Watkins, L.

**Healthcare**, 3/2019, Vol.7(1), p.2

In the current era, pediatric sepsis remains a public health problem of significant prevalence and impact. With mortality rates practically unchanged over the years, this review hopes to briefly summarize the epidemiology and the current interventions for pediatric sepsis and point towards possible areas of improvement. Most pediatric studies of sepsis are either small, retrospective or observational. Given information technology spreading across country, and a stronger presence of clinical networks, development of multicenter prospective studies over the next decade should enable better treatments for pediatric sepsis, and improved outcomes.

[Vitamin D and Inflammatory Mediators in Preterm Infants with Late-Onset Sepsis: A Randomized Controlled Trial](#)

Abdel-Hady, H. et al

**Journal of pediatric gastroenterology and nutrition**, 04 January 2019

To evaluate biochemical and clinical effects of two different doses of vitamin D supplementation in preterm infants with late onset sepsis (LOS). A dose of 400 IU of vitamin D was adequate to treat vitamin D deficiency in the majority of premature infants with LOS. The two dosing regimens did not differ in clinical or biochemical changes.

[Management of early- and late-onset sepsis: results from a survey in 80 German NICUs.](#)

Litz, J.E. et al

**Infection**, January 3, 2019

The management of early- (EOS) and late-onset sepsis (LOS) and neonatal intensive care units (NICUs) has not been extensively evaluated. In summary, this survey reveals a significant gap between recent national German guidelines and daily practices in German NICUs.

Poston, J.T. et al

**BMJ**, 09 January 2019, Vol.364

Sepsis is defined as organ dysfunction resulting from the host's deleterious response to infection. One of the most common organs affected is the kidneys, resulting in sepsis associated acute kidney injury (SA-AKI) that contributes to the morbidity and mortality of sepsis. A growing body of knowledge has illuminated the clinical risk factors, pathobiology, response to treatment, and elements of renal recovery that have advanced our ability to prevent, detect, and treat SA-AKI. Despite these advances, SA-AKI remains an important concern and clinical burden, and further study is needed to reduce the acute and chronic consequences. This review summarizes the relevant evidence, with a focus on the risk factors, early recognition and diagnosis, treatment, and long term consequences of SA-AKI. In addition to literature pertaining to SA-AKI specifically, pertinent sepsis and acute kidney injury literature relevant to SA-AKI was included.

[Using lean methodology to optimize time to antibiotic administration in patients with sepsis](#)

Hornig, M. et al

**The Bulletin of the American Society of Hospital Pharmacists**, 2018, Vol. 75(5Supplement1), pp.S13-S23

Results of a study to apply lean methodology to an inpatient pharmacy workflow to optimize timely administration of Centers for Medicare and Medicaid Services (CMS)-approved antibiotics for patients with severe sepsis or septic shock are presented. Lean methodology was successfully used to reduce time to antibiotic administration, which led to improved compliance with the newly implemented sepsis CMS core measure.

[Risk of Subsequent Sepsis Within 90 Days After a Hospital Stay by Type of Antibiotic Exposure](#)

Baggs, J. et al

**Clinical Infectious Diseases**, 2018, Vol. 66(7), pp.1004-1012

We examined the risk of sepsis within 90 days after discharge from a previous hospital stay by type of

[Burden of Streptococcus pneumoniae sepsis in children after introduction of pneumococcal conjugate vaccines - a prospective population-based cohort study](#)

Asner, S. A. et al

**Clinical Infectious Diseases**, 01/02/2019

Population-based studies assessing the impact of pneumococcal conjugate vaccines (PCV) on burden of pneumococcal sepsis in children are lacking. We aimed to assess this burden following introduction of PCV-13 in a nationwide cohort study. The incidence of pneumococcal sepsis in children shortly after introduction of PCV-13 remained substantial. Meningitis mostly due to non-vaccine serotypes and disease caused by serotype 3 represented significant predictors of severity.

[Does bovine lactoferrin prevent late-onset neonatal sepsis?](#)

Doyle, Lex W ; Cheong, Jeanie L Y

The Lancet 2019 Jan 8. *Commentary*

Prevention of late-onset neonatal sepsis (LOS) in infants born very preterm (<32 weeks' gestation) is paramount because of its associated mortality and morbidity. Lactoferrin has antimicrobial properties and could be preventive. Lactoferrin concentrations in human breastmilk vary little with gestational age and fall over time after birth; they are lower in infant formulas. Importantly, very preterm infants have low enteral intakes in the first days after birth, and this can persist for weeks. Consequently, infants born very preterm might benefit from supplemental lactoferrin to prevent LOS

**Adult sepsis**

[Combatting Sepsis: A Public Health Perspective](#)

Dantes, R. B. et al

**Clinical Infectious Diseases**, 2018, Vol. 67(8), pp.1300-130

Public health professionals and organizations have an opportunity to create a more comprehensive sepsis

antibiotic received during the previous stay. Our study identified an increased risk of sepsis within 90 days of discharge among patients with exposure to high-risk antibiotics or increased quantities of antibiotics during hospitalization. Given that a significant proportion of inpatient antimicrobial use may be unnecessary, this study builds on previous evidence suggesting that increased stewardship efforts in hospitals may not only prevent antimicrobial resistance, Clostridium difficile infection, and other adverse effects, but may also reduce unwanted outcomes potentially related to disruption of the microbiota, including sepsis.

[Infectious Diseases Team for the Early Management of Severe Sepsis and Septic Shock in the Emergency Department](#)

Viale, P. et al

**Clinical Infectious Diseases**, 2017, Vol. 65(8), pp.1253-1259

The impact on patient survival of an infectious disease (ID) team dedicated to the early management of severe sepsis/septic shock (SS/SS) in Emergency Department (ED) has yet to be assessed. Implementation of an ID team for the early management of SS/SS in the ED improved the adherence to SSC recommendations and patient survival.

[Sepsis National Hospital Inpatient Quality Measure \(SEP-1\): Multistakeholder Work Group Recommendations for Appropriate Antibiotics for the Treatment of Sepsis](#)

Septimus, E.J. et al

**Clinical Infectious Diseases**, 2017, Vol. 65(9), pp.1565-1569

The Center for Medicare and Medicaid Services adopted the Early Management Bundle, Severe Sepsis/Septic Shock (SEP-1) performance measure to the Hospital Inpatient Quality Reporting Program in July 2015 to help address the high mortality and high cost associated with sepsis. The SEP-1 performance measure requires, among other critical interventions, timely administration of antibiotics to patients with sepsis or septic shock. The multistakeholder workgroup recognizes the need for SEP-1 but strongly

prevention strategy that spans the continuum of care and merges existing infection prevention strategies with chronic disease management and improved education on the signs and symptoms of worsening infection and sepsis. Recent public health efforts have improved our understanding of US national sepsis epidemiology and focused on increasing sepsis awareness. Additional opportunities and challenges include creating more integrated sepsis and infection prevention programs that encompass outpatient and inpatient care.

[National Performance on the Medicare SEP-1 Sepsis Quality Measure](#)

Barbash, I.J. et al

**Critical Care Medicine**, 2019, p.1

The Centers for Medicare and Medicaid Services requires hospitals to report compliance with a sepsis treatment bundle as part of its Inpatient Quality Reporting Program. We used recently released data from this program to characterize national performance on the sepsis measure, known as SEP-1. The majority of eligible hospitals reported SEP-1 data, and overall bundle compliance was highly variable. SEP-1 performance was associated with structural hospital characteristics and performance on other measures of hospital quality, providing preliminary support for SEP-1 performance as a marker of timely hospital sepsis care.

[Incidence and Predictive Factors of Sepsis Following Adult Spinal Deformity Surgery](#)

Zuckerman, S.I. et al

**Neurosurgery**, 2018 Nov, Vol.83(5), pp.965-972

Surgery for adult spinal deformity (ASD) improves quality of life, yet morbidity is high. Sepsis is a challenging postoperative complication that can result in death and drive inpatient resources. In patients undergoing ASD surgery, male sex, diabetes, ascites, bleeding disorder, functional dependency, excessive weight loss and increased operative time independently predicted sepsis. This perioperative patient profile can be used for preoperative risk assessment, patient counseling, and postoperative management for patients undergoing ASD surgery.

believes that multiple antibiotics listed in the antibiotic tables for SEP-1 are not appropriate and the use of these antibiotics, as called for in the SEP-1 measure, is not in alignment with prudent antimicrobial stewardship. To promote the appropriate use of antimicrobials and combat antimicrobial resistance, the workgroup provides recommendations for appropriate antibiotics for the treatment of sepsis.

[Combatting Sepsis: A Public Health Perspective](#)

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### [Conservative Fluid Management After Sepsis Resuscitation: A Pilot Randomized Trial](#)

Semler, M. et al

**Journal of Intensive Care Medicine**, 01/10/2019, p.088506661882318

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### [Bacterial sepsis triggers an antiviral response that causes translation shutdown](#)

Hato, T. et al

**The Journal of clinical investigation**, 02 January 2019, Vol.129(1), pp.296-309

In response to viral pathogens, the host upregulates antiviral genes that suppress translation of viral mRNAs. However, induction of such antiviral responses may not be exclusive to viruses, as the pathways lie at the intersection of broad inflammatory networks that can also be induced by bacterial pathogens. Collectively, our findings imply that translation shutdown is indifferent to the specific initiating pathogen and is an important determinant of tissue injury in sepsis.

### [Effect of Troponin I Elevation on Duration of Mechanical Ventilation and Length of Intensive Care Unit Stay in Patients With Sepsis](#)

Abdalla, M. et al

**Journal of Clinical Medicine Research**, 2/2019, Vol.11(2), pp.127-132

Sepsis is a leading cause of mortality and morbidity. Recent studies suggest that troponin elevation is associated with increased mortality in sepsis patients. The purpose of this study is to determine the effect of

The feasibility and clinical outcomes of conservative fluid management after sepsis resuscitation remain unknown. In this phase II trial, a conservative fluid management protocol did not decrease mean daily fluid balance by more than 500 mL among patients with sepsis.

[Comparison of the accuracy of neutrophil CD64, procalcitonin, and C-reactive protein for sepsis identification: a systematic review and meta-analysis](#)

Yeh, C-F. et al

**Annals of Intensive Care**, 12/2019, Vol.9(1)

Neutrophil CD64 is widely described as an accurate biomarker for the diagnosis of infection in patients with septic syndrome. We performed a systematic review and meta-analysis to evaluate the diagnostic accuracy of neutrophil CD64, comparing it with C-reactive protein (CRP) and procalcitonin (PCT) for the diagnosis of infection in adult patients with septic syndrome, based on sepsis-2 criteria. We searched the PubMed and Embase databases and Google Scholar. Original studies reporting the performance of neutrophil CD64 for sepsis diagnosis in adult patients were retained. The pooled sensitivity, specificity, diagnostic odds ratio (DOR), and hierarchical summary receiver operating characteristic (SROC) curve were calculated. In adult patients with septic syndrome, neutrophil CD64 levels are an excellent biomarker with moderate accuracy outperforming both CRP and PCT determinations.

[Death due to sepsis in patients diagnosed with prostate cancer](#)

Holland, B. et al

**The Prostate**, Feb 2019, Vol.79(3), p.295

To examine the prevalence and determinants of death due to sepsis in patients diagnosed with prostate cancer (Pca), we performed a retrospective analysis of 910 986 patients diagnosed with Pca between 1992 and 2010 identified from the Surveillance, Epidemiology, and End Results (SEER) database. Patients diagnosed with Pca are at increased risk of dying from sepsis, and the sepsis-related IBMR in these patients is increasing over time. There are significant disparities in the outcome of sepsis among Pca patients that require further research.

troponin elevation on mechanical ventilation duration and intensive care unit (ICU) length of stay in patients with sepsis. Additionally, we investigated the association between troponin elevation and septic shock. Troponin elevation was associated with longer duration of mechanical ventilation in patients admitted to ICU with sepsis. Troponin elevation was associated with higher risk for development of septic shock. No significant effect was observed in ICU length of stay and hospital length of stay.

[A Nationwide Comparison Between Sepsis-2 and Sepsis-3 Definition in Japan](#)

Takauji, S. et al

**Journal of Intensive Care Medicine**, 01/13/2019, p.088506661882315

Currently, it remains controversial whether the Sepsis-3 definition provides the most appropriate criteria for clinical use. The purpose of this study was to compare between the Sepsis-2 and Sepsis-3 definitions using Japan's nationwide registry. The ICU mortality of the "Sepsis-2 shock-only" group was significantly low. Besides septic shock diagnosed by the Sepsis-3 definition selects patients with more severe cases of sepsis among the "Sepsis-2 shock" group.

[Effects of nutrition factors on mortality and sepsis occurrence in a multicenter university-based surgical intensive care unit in Thailand \(THAI-SICU study\)](#)

Auiwattanakul, S. et al

**Nutrition**, February 2019, Vol.58, pp.94-99

The aim of this study was to demonstrate the role of nutrition factors on a 28-d mortality outcome and sepsis occurrence in surgical intensive care unit. Nutrition factors affecting the mortality or sepsis occurrence in this study were BMI, enteral feeding or combination with parenteral nutrition, severe weight loss, preadmission albumin  $\leq 2.5$ , and at risk according to NRS-2002.



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