

SEPSIS BULLETIN

21 June 2018

Neonatal and paediatric sepsis

[Antibiotics at the time of removal of central venous catheter to reduce morbidity and mortality in newborn infants.](#)

McMullan, R.L. et al

Cochrane Database Syst Rev. 2018 Mar 7;3:CD012181. Late-onset sepsis is associated with increased rates of mortality and morbidity in newborn infants, in addition to poorer long-term developmental outcomes and increased length of stay and hospital costs. Central line-associated blood stream infection (CLABSI) is the most common cause of late-onset sepsis in hospitalised infants, and prevention of CLABSI is a key objective in neonatal care. Increased frequency of CLABSI around the time of removal of central venous catheters (CVCs) has been reported, and use of antibiotics at the time of removal may reduce the incidence and impact of late-onset sepsis in vulnerable newborn infants. Only one randomised controlled trial was eligible for inclusion in this analysis. Forty-four of a total of 88 infants received two doses of cephazolin at the time of removal of CVC compared with no antibiotics at the time of removal of CVC in the control group. No infant in the intervention group developed late-onset sepsis after CVC removal compared with five of 44 (11%) in the control group (risk ratio (RR) 0.09, 95% confidence interval (CI) 0.01 to 1.60). Cephazolin given at the time of removal of CVC did not statistically significantly alter late-onset sepsis rates and led to no significant differences in any of the prespecified outcomes. Review authors judged the study to be of low quality because of high risk of bias and imprecision.

Adult sepsis (cont.)

[Sepsis-induced acute kidney injury: A disease of the microcirculation.](#)

Ma, S. et al.

Microcirculation (New York); Jun 2018 ; p. e12483 Acute kidney injury (AKI) is a common complication of sepsis and is significantly associated with mortality. Sepsis accounts for more than 50% of the cases of AKI, with a mortality rate of up to 40%. The pathogenesis of septic AKI is complex, but there is emerging evidence that, at least in the first 48 hours, the defects may be functional rather than structural in nature. In this review, we outline the recent progress made in understanding how these drugs may influence the renal microcirculation, which represents a crucial step towards developing better approaches for the circulatory management of patients with septic AK

[Life after sepsis: an international survey of survivors to understand the post-sepsis syndrome.](#)

Huang, C.Y. et al

Int J Qual Health Care. 2018 Jun 19.

In this study, we aim to describe the post-sepsis syndrome from the perspective of the sepsis survivors. Sepsis survivors suffer from a myriad of physiologic, physical and psychological challenges. Survivors overall reveal dissatisfaction with sepsis-related care, suggesting areas for improvement both in-hospital and post-discharge.

[Rethinking the concept of sepsis and septic shock.](#)

A Cabrita, J. et al

[Role of selenium supplementation in prevention of late onset sepsis among very low birth weight neonates: A systematic review of randomized controlled trials.](#)

Garg, B. et al

J Matern Fetal Neonatal Med. 2018 May 23:1-171.

Neonatal sepsis is one of the most common causes of neonatal morbidity and mortality. Selenium has antioxidant and immune-modulating properties. Evidences from current systematic review revealed that selenium supplementation has some role in the prevention of LOS. However, due to limited evidences and heterogeneity between studies, large RCTs are recommended among VLBW neonates.

[Antibiotic Stewardship in the Neonatal Intensive Care Unit: Effects of an Automatic 48-Hour Antibiotic Stop Order on Antibiotic Use.](#)

Astorga, M.C. et al

J Pediatric Infect Dis Soc. 2018 May 28. [Epub ahead of print]

Meeting antibiotic stewardship goals in the neonatal intensive care unit (NICU) is challenging because of the unique nature of newborns and the lack of specificity of clinical signs of sepsis. Antibiotics are commonly continued for 48 hours pending culture results and clinical status. The goal of this study was to examine if the implementation of a 48-hour automatic stop (autostop) order during NICU admissions would decrease antibiotic use at UnityPoint Health-Meriter. An admission-order autostop was highly effective at decreasing antibiotic usage with no doses intended for a pathogen missed. Fewer doses of certain antibiotics outside of the admission order set were administered, particularly vancomycin, which results in our speculation that provider awareness of the antibiotic stewardship initiative might have altered prescribing practices.

[Pilot study demonstrates that placental histology can provide an additional tool for diagnosing early-onset neonatal sepsis.](#)

Ykema, J.M.A. et al

Acta Paediatr. 2018 May 22.

We explored whether placental histology could help to diagnose early-onset neonatal sepsis (EONS), guide clinical decision-making 48 hours after birth and reduce antibiotic use. Histological examination of the placenta helped to diagnose EONS and guide clinical decision-making 48 hours after birth and led to a clinically relevant reduction in antibiotic use.

Eur J Intern Med. 2018 Jun 16. pii: S0953-6205(18)30234-6

Sepsis is a major global health problem and represents a challenge for physicians all over the world. The knowledge of sepsis and septic shock is a topic of interest among the scientific community and society in general. New guidelines for management of sepsis and septic shock were developed in 2016, providing an update on this area. In Sepsis-3 new definitions for sepsis and septic shock were published. The purpose of this narrative review is to discuss and compare the new criteria of 2016 with the old criteria, purposing at the same time an alternative approach for this topic.

[Candida burn wound sepsis: The "holy trinity" of management.](#)

Matthaiou, D.K. et al

Intensive Crit Care Nurs. 2018 Jun;46:4-5.

Survival following severe burn injury has been substantially improved with fatal outcome nearly exclusively observed among the elderly, patient with extreme (>85%) total burnt surface area or patients suffering from inhalation injury necessitating mechanical ventilation. The more severely burned cases are especially at risk of additional complications, adding substantial morbidity.

[Diagnosis of sepsis from a drop of blood by measurement of spontaneous neutrophil motility in a microfluidic assay](#)

Ellett, F. et al

Nature Biomedical Engineering 2, pages207–214 (2018)

Current methods for the diagnosis of sepsis have insufficient precision, causing regular misdiagnoses. Microbiological tests can help to diagnose sepsis, but are usually too slow to have an impact on timely clinical decision-making. Neutrophils have a high sensitivity to infections, yet measurements of neutrophil surface markers, genomic changes and phenotype alterations have had only a marginal effect on sepsis diagnosis. Here, we report a microfluidic assay that measures, from one droplet of diluted blood, the spontaneous motility of neutrophils in the presence of plasma.

[Sepsis in pregnancy and the puerperium.](#)

Burlinson, C.E.G. et al

[Trends in late-onset sepsis in a neonatal intensive care unit following implementation of infection control bundle: A 15-year audit.](#)

Pharande, P. et al

J Paediatr Child Health. 2018 Jun 11. [Epub ahead of print]

Late-onset sepsis (LOS) is a frequent and important cause of morbidity and mortality in newborn infants admitted to neonatal intensive care units (NICUs). The objective of this study is to evaluate the impact of various infection control quality measures introduced as a bundle on the trends of the LOS in a NICU. Multifaceted infection control bundle practices with a concerted team effort in the implementation, with continuing education, feedback and reinforcement of best infection control practices, can sustain the gains achieved by infection control for a long period of time.

[Cerebral blood flow and serum neuron-specific enolase in early-onset neonatal sepsis.](#)

El Shimy, M.S. et al.

Pediatric research; May 2018

Sepsis leads to systemic inflammatory response with cerebral blood flow (CBF) alteration and blood-brain barrier disruption that contribute to sepsis-associated encephalopathy (SAE). We aimed to evaluate cord blood neuron-specific enolase (cNSE) and CBF in early-onset neonatal sepsis (EONS) as predictors of SAE and to define short-term neurodevelopmental outcomes among survivors. High CBF and cNSE could be useful markers for prediction of SAE. SAE impairs neurodevelopmental scales at 6 months

Adult sepsis

[Alterations in Mitochondrial Function in Blood Cells Obtained from Patients with Sepsis Presenting to an Emergency Department.](#)

Jang, David H. et al.

Shock (Augusta, Ga.); Jun 2018

Mitochondrial dysfunction has been implicated as a key cellular event leading to organ dysfunction in sepsis. Our objective is to measure changes in mitochondrial bioenergetics in subjects with early presentation of sepsis to provide insight into the incompletely understood pathophysiology of the dysregulated host response in sepsis. Bedside measurement of mitochondrial respiration can be minimally invasive and performed in a timely manner. Mitochondrial dysfunction, detected by decreased oxygen consumption

Int J Obstet Anesth. 2018 Jun 16. pii: S0959-289X(17)30463-6.

Sepsis remains a leading cause of maternal morbidity and mortality. Recognition and treatment of maternal sepsis are often delayed due to the physiological adaptations of pregnancy and vague or absent signs and symptoms during its initial presentation. Over the past decade, our understanding of sepsis has evolved and maternal early warning systems have been developed in an effort to help providers promptly identify and stratify parturients who are at risk. In addition, new consensus definitions and care bundles have recently been published by the World Health Organization and the Surviving Sepsis Campaign to facilitate earlier recognition and timely management of sepsis. In this narrative review, we summarize the available evidence about sepsis and provide an overview of the research efforts focused on maternal sepsis to date. Controversies and challenges surrounding the anesthetic management of parturients with sepsis or at risk of developing sepsis during pregnancy or the puerperium will be highlighted.

[Combined Biomarkers Predict Acute Mortality Among Critically Ill Patients With Suspected Sepsis.](#)

Kelly, B.J. et al

Critical care medicine; Jul 2018; vol. 46 (no. 7); p. 1106-1113

Sepsis is associated with high early and total in-hospital mortality. Despite recent revisions in the diagnostic criteria for sepsis that sought to improve predictive validity for mortality, it remains difficult to identify patients at greatest risk of death. We compared the utility of nine biomarkers to predict mortality in subjects with clinically suspected bacterial sepsis. Combined biomarkers predict risk for 14-day and total mortality among subjects with suspected sepsis. Serum amyloid P and tissue plasminogen activator demonstrated the best discriminatory ability in this cohort.

[Diagnostic Accuracy of CD64 for Sepsis in Emergency Department.](#)

Dal Ponte, S.T. et al.

Journal of global infectious diseases; 2018; vol. 10 (no. 2); p. 42-46

Sepsis is a systemic inflammatory response to suspected or confirmed infection. Clinical evaluations are essential for its early detection and treatment.

utilized for energy production and depleted cellular bioenergetics reserve.

Blood cultures may take as long as 2 days to yield a result and are not always reliable. However, recent studies have suggested that neutrophil CD64 expression may be a sensitive and specific alternative for the diagnosis of systemic infection. CD64 seems to be a useful, sensitive, and specific biomarker in discriminating between SIRS and sepsis.

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