Here is the latest edition of the Sepsis Bulletin. The bulletin covers the latest information on sepsis and comes out monthly. Next edition is due January 2020. Older editions are available as pdfs on the Keeping Up To Date library guide (http://libguides.bodleian.ox.ac.uk/Keeping_up_to_date)

Please let me know if there is anything you would like to see highlighted in the bulletin

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SEPSIS BULLETIN
December 2019

NEWS2

Gram-negative bloodstream infections and sepsis: risk factors, screening tools and surveillance.
Mitchell E; et al
British medical bulletin; Dec 2019
Incidence of gram-negative bloodstream infections (GNBSIs) and sepsis are rising in the UK. Healthcare-associated risk factors have been identified that increase the risk of infection and associated mortality. Current research is focused on identifying high-risk patients and improving the methods used for surveillance. A range of healthcare-associated risk factors independently associate with the risk of GNBSIs and sepsis. There are calls to move away from using simple comorbidity scores to predict the risk of sepsis-associated mortality, instead more advanced multimorbidity models should be considered. Advanced risk models should be created and

Adult sepsis (cont.)

Population pharmacokinetic model of Vancomycin based on therapeutic drug monitoring data in critically ill septic patients.
Kovacevic T; et al
Journal of critical care; Feb 2020; vol. 55 ; p. 116-121
The present study aimed to establish a population pharmacokinetic model of vancomycin, including adult critically ill septic patients, with normal and impaired renal function. The developed population vancomycin model may be used in estimating individual CL for adult critically ill septic patients, and could be applied for individualizing dosage regimens taking into account the continuous effect of CrCl.

Cost-effectiveness of second-line vasopressors for the treatment of septic shock.

evaluatr for their ability to predict sepsis-associated mortality. Investigations into the accuracy of NEWS2 to predict sepsis-associated mortality are required.

Neonatal, paediatric and maternal sepsis

[Incidence of necrotising enterocolitis before and after introducing routine prophylactic Lactobacillus and Bifidobacterium probiotics.](#)
Robertson C; et al.
Archives of disease in childhood. Fetal and neonatal edition; Oct 2019
We compare rates of necrotising enterocolitis (NEC), late-onset sepsis, and mortality in 5-year epochs before and after implementation of routine daily multistrain probiotics administration in high-risk neonates. Administration of multispecies Lactobacillus and Bifidobacterium probiotics has been associated with a significantly decreased risk of NEC and late-onset sepsis in our neonatal unit, and no safety issues. Our data are consistent with routine use of Lactobacillus and Bifidobacterium combination probiotics having a beneficial effect on NEC prevention in very preterm neonates.

[Development of the FAST-M maternal sepsis bundle for use in low resource settings: a modified Delphi process.](#)
Lissauer D; et al.
BJOG : an international journal of obstetrics and gynaecology; Nov 2019
We develop a sepsis care bundle for the initial management of maternal sepsis in low resource settings. A clinically relevant maternal sepsis bundle for low resource settings has been developed by international consensus.

[An Unknown Risk Factor for Sepsis in Very Low Birth Weight Preterms: ABO Blood Groups (BGaPS Study).](#)
Cakir U. et al.
Am J Perinatol. 2019 Nov 22.
There is insufficient study of the association of blood groups with neonatal diseases. The aim of this study was to evaluate the blood groups associated with sepsis and blood groups in preterm infants. Our study was the first study showing a relationship between certain blood groups and EOS/LOS in premature infants as well as meningitis.

[Utilization of a Neonatal Early-Onset Sepsis Calculator to Guide Initial Newborn Management.](#)
Leonardi BM et al
Pediatr Qual Saf. 2019 Sep 23;4(5):e214.
Within our hospital system, all infants born to mothers with chorioamnionitis were directly admitted to the neonatal intensive care unit (NICU) for evaluation and treatment of presumed sepsis for a minimum of 48 hours, regardless of clinical appearance. Implementation

Lam SW; et al
Journal of critical care; Feb 2020; vol. 55 ; p. 48-55
We determine the cost-effectiveness of escalating doses of norepinephrine or norepinephrine plus the adjunctive use of vasopressin or angiotensin II as a second-line vasopressor for septic shock. Vasopressin is the most cost-effective second-line vasopressor in both the short- and long-term evaluations. Vasopressor price is a minor contributor to overall cost.

[Association of negative fluid balance during the de-escalation phase of sepsis management with mortality: A cohort study.](#)
Dhondup T; et al
Journal of critical care; Feb 2020; vol. 55 ; p. 16-21
We aimed to evaluate the impact of negative fluid balance during the fluid de-escalation phase of sepsis management. There is not only a significant association between outcomes of patients who were resuscitated for sepsis and achieving negative fluid balance, but also the amount of daily or cumulative negative fluid balance is associated with lower mortality of these patients. Prospective clinical trials are needed to validate this finding.

[Check Point Inhibitors and Their Role in Immunosuppression in Sepsis.](#)
Wakeley ME; et al
Critical care clinics; Jan 2020; vol. 36 (no. 1); p. 69-88
Checkpoint regulators are a group of membrane-bound receptors or ligands expressed on immune cells to regulate the immune cell response to antigen presentation and other immune stimuli, such as cytokines, chemokines, and complement. In the context of profound immune activation, such as sepsis, the immune system can be rendered anergic by these receptors to prevent excessive inflammation and tissue damage. If this septic immunosuppression is prolonged, the host is unable to mount the appropriate immune response to a secondary insult or infection. This article describes the manner in which major regulators in the B7-CD28 family and their ligands mediate immunosuppression in sepsis.

[Biomarkers of Infection and Sepsis.](#)
Opal SM; Wittebole X
Critical care clinics; Jan 2020; vol. 36 (no. 1); p. 11-22
The role of biomarkers for detection of sepsis has come a long way. Molecular biomarkers are taking front stage at present, but machine learning and other computational measures using bigdata sets are promising. Clinical research in sepsis is hampered by lack of specificity of the diagnosis; sepsis is a syndrome with no uniformly agreed definition. This lack of diagnostic precision means there is no gold

of a risk-stratification system for thesWe high-risk infants based on the early onset sepsis (EOS) calculator may decrease NICU admissions and antibiotics exposure in well-appearing neonates. This study demonstrates that the implementation of the sepsis risk calculator at an academic medical center can decrease the number of asymptomatic infants transferred to the NICU for empiric antibiotic treatment.

[Determinants of neonatal sepsis among neonates in the northwest part of Ethiopia: case-control study.](#)
Alemu M, et al
Ital J Pediatr. 2019 Nov 28;45(1):150.
Neonatal sepsis is one of the leading causes of neonatal morbidity and mortality. Despite implementing of different preventive interventions, the burden of neonatal sepsis is reporting in different areas of Ethiopia. For further interventions, identifying its determinants is found to be crucial. Premature rupture of membrane was found to be obstetric-related determinant of neonatal sepsis. Gestational age < 37 weeks, not crying immediately at birth, and have received resuscitation at birth were found to be neonatal-related risk factors of neonatal sepsis. Infection prevention strategies need to be strengthening and/or implementing by providing especial attention for the specified determinants.

[A National Approach to Pediatric Sepsis Surveillance.](#)
Hsu HE, et al
Pediatrics. 2019 Nov 27. pii: e20191790.
Pediatric sepsis is a major public health concern, and robust surveillance tools are needed to characterize its incidence, outcomes, and trends. The increasing use of electronic health records (EHRs) in the United States creates an opportunity to conduct reliable, pragmatic, and generalizable population-level surveillance using routinely collected clinical data rather than administrative claims or resource-intensive chart review. We propose a preliminary pediatric sepsis event surveillance definition and outline next steps for refining and validating these criteria so that they may be used to estimate the national burden of pediatric sepsis and support site-specific surveillance to complement ongoing initiatives to improve sepsis prevention, recognition, and treatment.

[Prolonged intravenous immunoglobulin treatment in very low birth weight infants with late onset sepsis.](#)
Bancalari Molina A, et al
J Neonatal Perinatal Med. 2019 Nov 16.
Neonatal infections are a leading cause of morbi-mortality despite advances in antimicrobials and neonatal care. Preterm infants have greater susceptibility to sepsis due to an immature immune system and lower immunoglobulin levels. Intravenous immunoglobulins (IVIG) have been used in several studies as an adjuvant treatment to improve this physiological immune

standard for this diagnosis. The final conclusion is expert opinion, which is not bad but not perfect. Perhaps machine learning will displace expert opinion as the final and most accurate definition for sepsis.

[Metabolomics and the Microbiome as Biomarkers in Sepsis.](#)
Lee J; Banerjee D
Critical care clinics; Jan 2020; vol. 36 (no. 1); p. 105-113
Metabolomics is an emerging field of research interest in sepsis. Metabolomics provides new ways of exploring the diagnosis, mechanism, and prognosis of sepsis. Advancements in technologies have enabled significant improvements in identifying novel biomarkers associated with the disease progress of sepsis. The use of metabolomics in the critically ill may provide new approaches to enable precision medicine. Furthermore, the dynamic interactions of the host and its microbiome can lead to further progression of sepsis. Understanding these interactions and the changes in the host's genomics and the microbiome can provide novel preventive and therapeutic strategies against sepsis.

[Serum Protein Changes in Pediatric Sepsis Patients Identified With an Aptamer-Based Multiplexed Proteomic Approach.](#)
Shubin NJ; Navalkar K; Sampson D; Yager TD; Cermelli S; Seldon T; Sullivan E; Zimmerman JJ; Permut LC; Piliponsky AM
Critical care medicine; Jan 2020; vol. 48 (no. 1); p. e48-e57
Sepsis, a life-threatening organ dysfunction caused by a dysregulated host response to infection, is a leading cause of death and disability among children worldwide. Identifying sepsis in pediatric patients is difficult and can lead to treatment delay. Our objective was to assess the host proteomic response to infection utilizing an aptamer-based multiplexed proteomics approach to identify novel serum protein changes that might help distinguish between pediatric sepsis and infection-negative systemic inflammation and hence can potentially improve sensitivity and specificity of the diagnosis of sepsis over current clinical criteria approaches. The serum protein changes identified with the aptamer-based multiplexed proteomics approach used in this study can be useful to distinguish between sepsis and noninfectious systemic inflammation.

[Population-Specific Metabolic Alterations in Professional Antigen-Presenting Cells Contribute to Sepsis-Associated Immunosuppression.](#)
Schenz J; et al

deficiency, with different outcomes. Therapy with IVIG seems to be safe and effective as an adjuvant treatment in VLBW infants with sepsis.

Adult sepsis

Epidemiology and complications of late-onset sepsis: an Italian area-based study.
PLoS One. 2019 Nov 22;14(11):e0225407.
Berardi A. et al
This study provides the first Italian data regarding late-onset sepsis (LOS) in all gestational age groups. Compared to full-term neonates, very high rates of LOS and mortality occurred in neonates with a lower birth weight and gestational age. Group B streptococcus was the leading cause of meningitis. Excluding CoNS, the predominant pathogens were Escherichia coli and Staphylococcus aureus. Neonates with hospital-acquired LOS had a worse outcome. Antibiotic associations, recommended for empirical treatment of hospital- or community-acquired LOS, were adequate.

Prognosis of β-adrenergic blockade therapy on septic shock and sepsis: A systematic review and meta-analysis of randomized controlled studies.
Li J et al
Cytokine. 2019 Nov 19;126:154916.
β-adrenoceptor antagonist (β-blocker) may have potential in the treatment of septic shock and sepsis. However, the relevant research findings are still controversial. β-blocker of esmolol is safe and effective in improving 28-day mortality and controlling ventricular rate in patients with sepsis after fluid resuscitation, and has no significant adverse effect on tissue perfusion.

Evaluating a digital sepsis alert in a London multisite hospital network: a natural experiment using electronic health record data.
Honeyford K. et al
J Am Med Inform Assoc. 2019 Oct 26. pii: ocz186.
The study sought to determine the impact of a digital sepsis alert on patient outcomes in a UK multisite hospital network. Current evidence that digital sepsis alerts are effective is mixed. In this large UK study, a digital sepsis alert has been shown to be associated with improved outcomes, including timely antibiotics. It is not known whether the presence of alerting is responsible for improved outcomes or whether the alert acted as a useful driver for quality improvement initiatives. These findings strongly suggest that the introduction of a network-wide digital sepsis alert is associated with improvements in patient outcomes, demonstrating that digital based interventions can be successfully introduced and readily evaluated.

Conservative oxygen therapy for mechanically ventilated adults with sepsis: a post hoc analysis of data from the

Shock (Augusta, Ga.); Jan 2020; vol. 53 (no. 1); p. 5-15
Sepsis is a complex host response triggered by an infection, with the patient's immune system between hyper- and hypo-responsiveness being the main reason for the syndromes' development and propagation. Studies conducted in peripheral blood mononuclear cells uncovered an association between an impaired immunometabolism and the severity and outcome of the disease. With this prospective observational study, we aimed to evaluate the immunometabolic phenotype of monocytes and B cells and its association with the cell function. Our results provide evidence for the induction of a state of trained immunity in monocytes and an early but transient immunosuppressive phenotype accounting for peripheral sepsis-induced vulnerability to infections. B cells exhibit an unsustainable activation contributing to adaptive immunosuppression.

Norepinephrine vs Vasopressin: Which Vasopressor Should Be Discontinued First in Septic Shock? A Meta-Analysis.
Wu Z; et al
Shock (Augusta, Ga.); Jan 2020; vol. 53 (no. 1); p. 50-57
Patients with septic shock in whom norepinephrine (NE) infusion alone is insufficient to raise blood pressure require the concomitant administration of vasopressin (VP). However, current guidelines do not advise clinicians as to which vasoactive agent to discontinue first once the patient's septic shock begins to resolve. Moreover, there is controversial data guiding clinicians on how to discontinue vasopressors for septic shock patients who are receiving a combination therapy of NE and VP. In adults with septic shock treated with concomitant VP and NE therapy, discontinuing VP first may lead to a higher incidence of hypotension but is not associated with mortality or ICU LOS. Further prospective studies with larger sample sizes are warranted.

Early Prediction of Sepsis From Clinical Data: The PhysioNet/Computing in Cardiology Challenge 2019.
Reyna MA; et al
Critical care medicine; Dec 2019
Sepsis is a major public health concern with significant morbidity, mortality, and healthcare expenses. Early detection and antibiotic treatment of sepsis improve outcomes. However, although professional critical care societies have proposed new clinical criteria that aid sepsis recognition, the fundamental need for early detection and treatment remains unmet. In response, researchers have proposed algorithms for early sepsis detection, but directly comparing such methods has not been

intensive care unit randomized trial comparing two approaches to oxygen therapy (ICU-ROX).
Young P. et al
Intensive Care Med. 2019 Nov 20.
Sepsis is a common reason for intensive care unit (ICU) admission and mortality in ICU patients. Despite increasing interest in treatment strategies limiting oxygen exposure in ICU patients, no trials have compared conservative vs. usual oxygen in patients with sepsis. Point estimates for the treatment effect of conservative oxygen therapy on 90-day mortality raise the possibility of clinically important harm with this intervention in patients with sepsis; however, our post hoc analysis was not powered to detect the effects suggested and our data do not exclude clinically important benefit or harm from conservative oxygen therapy in this patient group.

Sepsis outcomes in solid organ transplant recipients.
Gotur DB, et al
Transpl Infect Dis. 2019 Nov 21:e13214.
We present data on a cohort of patients diagnosed with sepsis over a 10-year period comparing outcomes in solid organ transplant (SOT) and non-solid organ transplant (non-SOT) recipients. Sepsis in solid organ transplants and non-solid organ transplant patients have similar mortality; however, the subset of heart and lung transplant recipients with sepsis has a higher rate of mortality compared with the non-solid organ transplant recipients. SOT with sepsis as a group has a higher hospital readmission rate compared with non-transplant sepsis patients.

Triage and flow management in sepsis.
Pires HHG et al
Int J Emerg Med. 2019 Nov 21;12(1):36.
Sepsis is a major public health problem, with a growing incidence and mortality rates still close to 30% in severe cases. The speed and adequacy of the treatment administered in the first hours of sepsis, particularly access to intensive care, are important to reduce mortality. This study compared the triage strategies and intensive care rationing between septic patients and patients with other indications of intensive care. This study included all patients with signs for intensive care, enrolled in the intensive care management system of a Brazilian tertiary public emergency hospital, from January 1, 2010, to December 31, 2016. The intensivist periodically evaluated the requests, prioritizing them according to a semi-quantitative scale. Demographic data, Charlson Comorbidity Index (CCI), Sequential Organ Failure Assessment (SOFA), and quick SOFA (qSOFA), as well as surgical interventions, were used as possible confounding factors in the construction of incremental logistic regression models for prioritization and admission to intensive care outcomes. Septic patients had a lower priority for ICU admission and longer waiting times for an ICU vacancy than patients with other critical

possible because of different patient cohorts, clinical variables and sepsis criteria, prediction tasks, evaluation metrics, and other differences. To address these issues, the PhysioNet/Computing in Cardiology Challenge 2019 facilitated the development of automated, open-source algorithms for the early detection of sepsis from clinical data. Diverse computational approaches predict the onset of sepsis several hours before clinical recognition, but generalizability to different hospital systems remains a challenge.

Balanced Crystalloids versus Saline in Sepsis. A Secondary Analysis of the SMART Clinical Trial.
Brown RM; et al
American journal of respiratory and critical care medicine; Dec 2019; vol. 200 (no. 12); p. 1487-1495
Administration of intravenous crystalloid solutions is a fundamental therapy for sepsis, but the effect of crystalloid composition on patient outcomes remains unknown. We compare the effect of balanced crystalloids versus saline on 30-day in-hospital mortality among critically ill adults with sepsis. Among patients with sepsis in a large randomized trial, use of balanced crystalloids was associated with a lower 30-day in-hospital mortality compared with use of saline.

Time to Recognition of Sepsis in the Emergency Department Using Electronic Health Record Data: A Comparative Analysis of Systemic Inflammatory Response Syndrome, Sequential Organ Failure Assessment, and Quick Sequential Organ Failure Assessment.
Prasad PA; et al
Critical care medicine; Dec 2019
Early identification of sepsis is critical to improving patient outcomes. Impact of the new sepsis definition (Sepsis-3) on timing of recognition in the emergency department has not been evaluated. Our study objective was to compare time to meeting systemic inflammatory response syndrome (Sepsis-2) criteria, Sequential Organ Failure Assessment (Sepsis-3) criteria, and quick Sequential Organ Failure Assessment criteria using electronic health record data. Systemic inflammatory response syndrome and Sequential Organ Failure Assessment initially identified distinct populations. Using systemic inflammatory response syndrome resulted in earlier electronic health record sepsis identification in greater than 50% of patients. Using Sequential Organ Failure Assessment alone may delay identification. Using systemic inflammatory response syndrome alone may lead to missed sepsis presenting as acute organ dysfunction. Thus, a combination of inflammatory (systemic inflammatory response syndrome) and organ dysfunction (Sequential Organ

conditions. Overall, this implied a 2.7-fold increased risk of mortality in septic patients.

Sepsis 2019: What Surgeons Need to Know.
Ho VP et al
Surg Infect (Larchmt). 2019 Nov 22.
The definition of sepsis continues to be as dynamic as the management strategies used to treat this. Sepsis-3 has replaced the earlier systemic inflammatory response syndrome (SIRS)-based diagnoses with the rapid Sequential Organ Failure Assessment (SOFA) score assisting in predicting overall prognosis with regards to mortality. We have broadened our temporal and epidemiologic perspective of sepsis by understanding it both as an acute, time-sensitive, life-threatening illness to a chronic condition that increases the risk of mortality up to five years post-discharge. Artificial intelligence, machine learning, and bedside scoring systems can assist the clinician in predicting post-operative sepsis. The public health role of the surgeon is key. This includes collaboration and multi-disciplinary antibiotic stewardship at a hospital level. It also requires controlling pharmaceutical sales and the unregulated dispensing of antibiotic agents globally through policy initiatives to control emerging resistance through prevention.

Risk and Prognostic Factors in Very Old Patients with Sepsis Secondary to Community-Acquired Pneumonia.
Cillóniz C. et al
J Clin Med. 2019 Jul 2;8(7). pii: E961.
Little is known about risk and prognostic factors in very old patients developing sepsis secondary to community-acquired pneumonia (CAP). In very old patients hospitalized with CAP, in-hospital and 1-year mortality rates were increased if they developed sepsis. Antibiotic therapy before hospital admission was associated with a lower risk of sepsis.

Structured, proactive care coordination versus usual care for Improving Morbidity during Post-Acute Care Transitions for Sepsis (IMPACTS): a pragmatic, randomized controlled trial.
Kowalkowski M, et al
Trials. 2019 Nov 29;20(1):660.
Hospital mortality for patients with sepsis has recently declined, but sepsis survivors still suffer from significant long-term mortality and morbidity. There are limited data that support effective strategies to address post-discharge management of patients hospitalized with sepsis. This pragmatic evaluation provides the most comprehensive assessment to date of a strategy to improve delivery of recommended post-sepsis care.

The early change of SOFA score as a prognostic marker of 28-day sepsis mortality: analysis through a derivation and a validation cohort.
Karakike E. et al.

Failure Assessment) criteria may enhance timely electronic health record-based sepsis identification.

Vasopressin Versus Norepinephrine for the Management of Septic Shock in Cancer Patients: The VANCS II Randomized Clinical Trial.
Hajjar LA; et al
Critical care medicine; Dec 2019; vol. 47 (no. 12); p. 1743-1750
Previous trials suggest that vasopressin may improve outcomes in patients with vasodilatory shock. The aim of this study was to evaluate whether vasopressin could be superior to norepinephrine to improve outcomes in cancer patients with septic shock. In cancer patients with septic shock, vasopressin as first-line vasopressor therapy was not superior to norepinephrine in reducing 28-day mortality rate.

Incidence and Outcomes of Sepsis in Korea: A Nationwide Cohort Study From 2007 to 2016.
Oh SY; et al
Critical care medicine; Dec 2019; vol. 47 (no. 12); p. e993-e998
This study aimed to estimate the incidence and clinical outcomes of sepsis in Korea from 2007 to 2016. The incidence of sepsis in Korea increased from 2007 to 2016, while the associated in-hospital mortality, hospital length of stay, and ICU admission rates decreased.

Epidemiology of intra-abdominal infection and sepsis in critically ill patients: "AbSeS", a multinational observational cohort study and ESICM Trials Group Project.
Blot S; et al
Intensive care medicine; Dec 2019; vol. 45 (no. 12); p. 1703-1717
We describe the epidemiology of intra-abdominal infection in an international cohort of ICU patients according to a new system that classifies cases according to setting of infection acquisition (community-acquired, early onset hospital-acquired, and late-onset hospital-acquired), anatomical disruption (absent or present with localized or diffuse peritonitis), and severity of disease expression (infection, sepsis, and septic shock). This multinational, heterogeneous cohort of ICU patients with intra-abdominal infection revealed that setting of infection acquisition, anatomical disruption, and severity of disease expression are disease-specific phenotypic characteristics associated with outcome, irrespective of the type of infection. Antimicrobial resistance is equally common in community-acquired as in hospital-acquired infection.

Since the Sepsis-3 criteria, change in Sequential Organ Failure Assessment (SOFA) score has become a key component of sepsis identification. Thus, it could be argued that reversal of this change (ΔSOFA) may reflect sepsis response and could be used as measure of efficacy in interventional trials. We aimed to assess the predictive performance of ΔSOFA for 28-day mortality. ΔSOFA on day 7 is a useful early prognostic marker of 28-day mortality and could serve as an endpoint in future sepsis trials alongside mortality.

[Thrombo-inflammatory prognostic score improves qSOFA for risk stratification in patients with sepsis: a retrospective cohort study.](#)

Li D, et al
Both the thrombo-inflammatory prognostic score (TIPS) and the quick sequential (sepsis-related) organ failure assessment (qSOFA) are quick prognostic scores for sepsis during the early phase, while either of two scores has limited prognostic value for sepsis patients. This study aimed to evaluate whether TIPS adds more information of sepsis risk stratification for qSOFA. The prognostic value of qSOFA for patients with sepsis was enhanced by adding the TIPS score on admission for risk prediction in patients with sepsis during early phases in the ED.

[Effect of propofol, midazolam and dexmedetomidine on ICU patients with sepsis and on arterial blood gas.](#)

Ding J, Chen Y, Gao Y.
Effects of propofol, midazolam and dexmedetomidine on patients with sepsis in intensive care unit (ICU) and on arterial blood gas (ABG) were studied. In conclusion, propofol, midazolam and dexmedetomidine are effective and safe in the sedative treatment of ICU patients with sepsis, but dexmedetomidine has the best effect on protecting blood pressure and cardiac functions, which is worthy of use in the clinic.

[Gender differences in mortality and quality of life after septic shock: A post-hoc analysis of the ARISE study.](#)

Luethi N; et al
We assess the impact of gender and pre-menopausal state on short- and long-term outcomes in patients with septic shock. This post-hoc analysis of a large multi-center trial in early septic shock has shown no short- or long-term survival effect for women overall as well as in the pre-menopausal age-group.

[Machine learning for prediction of septic shock at initial triage in emergency department.](#)

Kim J; et al

[Sepsis induced cardiomyopathy: Pathophysiology and use of mechanical circulatory support for refractory shock.](#)

Nabzdyk CS et al
Sepsis remains a major cause of morbidity and mortality, and sepsis-induced cardiomyopathy (SCM) has been recognized as a relevant complication. In this article, the pathophysiology of SCM and the literature regarding the clinical care with a focus on the use of mechanical circulatory support for the rescue of patients with severe SCM are reviewed. Lastly, a pragmatic approach to the care of this complex patient population is provided using a representative case example.

[Increased atrial contraction contribution to left ventricular filling during early septic shock.](#)

Monge García MI et al
We assess the atrial systolic function and the contribution of atrial contraction to left ventricular (LV) filling in septic shock patients as compared with healthy volunteers. In septic shock patients, LA systolic function increased and greatly contributed to support LV filling. These results highlight the role of preserving atrial contraction on the hemodynamic resuscitation in early septic shock.

[Hemodynamic profiles following digoxin use in patients with sepsis in the ICU.](#)

Herasevich S; et al
We explore the impact of digoxin on hemodynamic parameters in patients with sepsis and tachycardia admitted to the intensive care unit. Early digoxin administration in patients with sepsis and tachycardia is uncommon but associated with improvements of hemodynamic parameters. These preliminary results will help formulate future hypotheses for focused trials on utility, efficacy and safety of digoxin in sepsis.

[Comparison of the sepsis-2 and sepsis-3 definitions in severely injured trauma patients.](#)

Eriksson J; et al
We evaluate the performance of the new SOFA-based sepsis definition in trauma patients. The sepsis-3 definition identifies much fewer patients and is more strongly associated with adverse outcomes than the sepsis-2 definition. The sepsis-3 definition seems to be useful in the post trauma setting.

[Association between DNA and RNA oxidative damage and mortality in septic patients.](#)

We hypothesized utilizing machine learning (ML) algorithms for screening septic shock in ED would provide better accuracy than qSOFA or MEWS. ML classifiers significantly outperforms clinical scores in screening septic shock at ED triage.

[Delayed vasopressor initiation is associated with increased mortality in patients with septic shock.](#)
Colon Hidalgo D; et al
Journal of critical care; Feb 2020; vol. 55 ; p. 145-148
Mortality rate for septic shock, despite advancements in knowledge and treatment, remains high. Treatment includes administration of broad-spectrum antibiotics and stabilization of the mean arterial pressure (MAP) with intravenous fluid resuscitation. Fluid-refractory shock warrants vasopressor initiation. There is a paucity of evidence regarding the timing of vasopressor initiation and its effect on patient outcomes. Vasopressor initiation after 6 h from shock recognition is associated with a significant increase in 30-day mortality. Vasopressor administration within 6 h was associated with shorter time to achievement of MAP goals and higher vasopressor-free hours within the first 72 h.

[Left-Sided Ventricular-arterial Coupling and Volume Responsiveness in Septic Shock Patients.](#)
Li S; et al
Shock (Augusta, Ga.); Dec 2019; vol. 52 (no. 6); p. 577-582
Suboptimal ventricular arterial coupling (VAC) is one of the pivotal determinants of inefficient heart performance despite appropriate administration of fluids or vasopressors in shocks. Here, we investigate the performance of VAC in patients who are unresponsive to fluid administration in septic shock. Variation of VAC is often related to suboptimal ventricular volume responsiveness among patients with septic shock.

Lorente L; et al
Journal of critical care; Dec 2019; vol. 54 ; p. 94-98
DNA and RNA oxidative damage occurs during sepsis. Higher urinary 8-hydroxy-2'-deoxyguanosine (8-OHdG) levels (from oxidation of guanosine from DNA) have been found in non-surviving patients than in surviving septic patients. However, the relation between DNA and RNA oxidative damage and mortality in septic patients has never been published; thus, the objective of this study was to determine the existence of this association. The new findings from our study were that oxidative DNA and RNA damage in septic patients was associated with mortality and lipid peroxidation.

[Heparin-Binding Protein as a Prognostic Biomarker of Sepsis and Disease Severity at the Emergency Department.](#)
Kahn F; et al
Shock (Augusta, Ga.); Dec 2019; vol. 52 (no. 6); p. e135-e145
Rapid and early detection of patients at risk to develop sepsis remains demanding. Heparin-binding protein (HBP) has previously demonstrated good prognostic properties in detecting organ dysfunction among patients with suspected infections. This study aimed to evaluate the plasma levels of HBP as a prognostic biomarker for infection-induced organ dysfunction among patients seeking medical attention at the emergency department. Among patients at the emergency department, HBP demonstrated good prognostic and discriminatory properties in detecting the most severely ill patients with infection.