



# LKS Current Awareness Bulletin

## Sepsis

Oct-Nov 2019

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Kind regards

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## In the News

20 November 2019 [Sepsis digital alert 'led to faster treatment with antibiotics'](#) - Digital alerts to notify doctors and nurses of patients with sepsis led to faster treatment with antibiotics and a fall in deaths, a study found. The system was tested in two London hospitals over two years, analysing data from more than 21,000 alerts.

Source: BBC News

25<sup>th</sup> October 2019 [Sepsis myths create 'unhealthy climate of fear', say experts](#)

Researchers say figures are often inflated and rush for antibiotics may fuel resistance Source: The Guardian

**Clinical characteristics, risk factors, immune status and prognosis of secondary infection of sepsis: a retrospective observational study**

**Source:** [BMC Anesthesiol.](#) 2019; 19: 185.

**Author:** Yao Chen, Yanyan Hu, Jin Zhang et al.

**Date:** October 2019

**Publication type:** Research Article

**Abstract:** Secondary infection has a higher incidence in septic patients and affects clinical outcomes. This study aims to investigate the clinical characteristics, risk factors, immune status and prognosis of secondary infection of sepsis. A four-year retrospective study was carried out in Zhongshan Hospital, Fudan University, enrolling septic patients admitted between January, 2014 and January, 2018. A total of 297 septic patients were enrolled, 92 of whom developed 150 cases of secondary infections. Respiratory tract was the most common site of secondary infection (n = 84, 56%) and *Acinetobacter baumannii* the most commonly isolated pathogen (n = 40, 31%). Urinary and deep venous catheterization increased the risk of secondary infection. Urinary and deep venous catheterization increased the risk of secondary infection, in which underlying immunosuppression might also play a role.

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**Improving the outcomes of patients presenting with sepsis in secondary care.**

**Author(s):** GUTTORMSEN, KARL; EKOKU, IGEMI; TREACY, JENNIFER; NIRANJAN, DIVYA; CLARK, LOUISA

**Source:** Wounds UK; Nov 2019; vol. 15 (no. 5); p. 62-65

**Publication Date:** Nov 2019

**Publication Type(s):** Academic Journal

Available at: [Wounds UK](#)

**Abstract:** The Sepsis Trust (2019) estimates there are at least 250,000 cases of sepsis in the UK and an associated 52,000 deaths. They go on to suggest that 14,000 of these deaths could be prevented through better recognition, early resuscitation and early escalation. The national confidential enquiry into patient outcomes and death found that Sepsis diagnoses were delayed due to inadequate local training and that even when it was diagnosed in a timely manner, lifesaving interventions were still being omitted (NHS England, 2015). This small pilot aimed at addressing these shortcomings, by providing local training and utilising resources available from the Sepsis Trust.

**Database:** CINAHL

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**New bacterial strain discovered in England and Wales linked to scarlet fever, sore throat and sepsis.**

**Author(s):**

**Source:** Operating Theatre Journal; Oct 2019 (no. 349); p. 15-15

**Publication Date:** Oct 2019

**Publication Type(s):** Academic Journal

**Database:** CINAHL

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**NT-proBNP levels might predict outcomes in severe sepsis, but renal function cannot be ignored.**

**Author(s):** Ye, Jiarong; Liang, Qianrong; Xi, Xiaotu

**Source:** Critical care (London, England); Nov 2019; vol. 23 (no. 1); p. 341

**Publication Date:** Nov 2019

**Publication Type(s):** Letter Comment

**PubMedID:** 31685007

Available at [Critical care \(London, England\)](#)

**Database:** Medline

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**Moraxella nonliquefaciens bloodstream infection and sepsis in a pediatric cancer patient: case report and literature review.**

**Author(s):** Correa-Martínez, Carlos L; Rauwolf, Kerstin K; Schuler, Franziska; Füller, Miriam; Kampmeier, Stefanie; Groll, Andreas H

**Source:** BMC infectious diseases; Oct 2019; vol. 19 (no. 1); p. 836

**Publication Date:** Oct 2019

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 31601195

Available at [BMC infectious diseases](#)

**Abstract:** BACKGROUND Moraxella nonliquefaciens is a usually non-pathogenic biofilm-producing Gram-negative coccobacillus which may colonize the upper respiratory tract, rarely causing invasive disease. Although very rare, bloodstream infections caused by this organism have been described, showing often a fatal outcome. Here, we report the case of a pediatric cancer patient with bloodstream infection and sepsis due to M. nonliquefaciens showing full recovery after appropriate antibiotic treatment. CASE PRESENTATION A three-year-old boy with stage IV neuroblastoma was admitted for high-dose chemotherapy with autologous stem cell rescue after standard neuroblastoma treatment. Despite receiving antimicrobial prophylaxis with trimethoprim/sulfamethoxazole, acyclovir and amphotericin B, the patient presented with fever of up to 39.5 °C and neutropenia. Besides a chemotherapy-related mucositis and an indwelling Broviac catheter (removed), no infection focus was identified on physical examination. Moraxella nonliquefaciens was identified in blood cultures. After antibiotic treatment and neutrophil recovery, the patient was fit for discharge. CONCLUSIONS The case described highlights the importance of an otherwise non-pathogenic microorganism, especially in immunosuppressed cancer patients. It should be kept in mind that, although very infrequently, Moraxella nonliquefaciens may cause bloodstream infections that can be successfully treated with prompt focus identification and antibiotic therapy.

**Database:** Medline

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**Effect of Vitamin C Infusion on Organ Failure and Biomarkers of Inflammation and Vascular Injury in Patients With Sepsis and Severe Acute Respiratory Failure: The CITRIS-ALI Randomized Clinical Trial.**

**Author(s):** Fowler, Alpha A; Truwit, Jonathon D; Hite, R Duncan et al.

**Source:** JAMA; Oct 2019; vol. 322 (no. 13); p. 1261-1270

**Publication Date:** Oct 2019

**Publication Type(s):** Research Support, N.i.h., Extramural Randomized Controlled Trial Multicenter Study Journal Article

**PubMedID:** 31573637

Available at [JAMA](#)

**Abstract:** Importance Experimental data suggest that intravenous vitamin C may attenuate inflammation and vascular injury associated with sepsis and acute respiratory distress syndrome (ARDS). Objective To determine the effect of intravenous vitamin C infusion on organ failure scores and biological markers of inflammation and vascular injury in patients with sepsis and ARDS. Design, Setting, and Participants The CITRIS-ALI trial was a randomized, double-blind, placebo-controlled, multicenter trial conducted in 7 medical intensive care units in the United States, enrolling patients (N = 167) with sepsis and ARDS present for less than 24 hours. The study was conducted from September 2014 to November 2017, and final follow-up was January 2018.

**Database:** Medline

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### **Performance of UK National Health Service compared with other high income countries: observational study**

**Author(s):** Papanicolas, Irene; Mossialos, Elias; Gundersen, Anders; Woskie, Liana; Jha, Ashish K

**Source:** BMJ : British Medical Journal (Online); Nov 2019; vol. 367

**Publication Date:** Nov 2019

**Publication Type(s):** Journal Article

Available at [BMJ \(Clinical research ed.\)](#)

**Abstract:** To determine how the UK National Health Service (NHS) is performing relative to health systems of other high income countries, given that it is facing sustained financial pressure, increasing levels of demand, and cuts to social care. Observational study using secondary data from key international organisations such as Eurostat and the Organization for Economic Cooperation and Development. Setting: Healthcare systems of the UK and nine high income comparator countries: Australia, Canada, Denmark, France, Germany, the Netherlands, Sweden, Switzerland, and the US. Main outcome measures 79 indicators across seven domains: population and healthcare coverage, healthcare and social spending, structural capacity, utilisation, access to care, quality of care, and population health. Results The UK spent the least per capita on healthcare in 2017 compared with all other countries studied (UK \$3825 (£2972; €3392); mean \$5700), and spending was growing at slightly lower levels (0.02% of gross domestic product in the previous four years, compared with a mean of 0.07%).

**Database:** BNI

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### **Sepsis: digital monitoring improves outcomes by alerting clinicians to deteriorating patients, study finds**

**Author(s):** Torjesen, Ingrid

**Source:** BMJ : British Medical Journal (Online); Nov 2019; vol. 367

**Publication Date:** Nov 2019

**Publication Type(s):** News

Available at [BMJ \(Clinical research ed.\)](#)

**Abstract:** A digital monitoring system for sepsis that alerts clinicians to signs of deterioration helped to reduce deaths and hospital stays, a study has found.<sup>1</sup> The system is based on the St John's Sepsis Agent algorithm, which highlights when a patient may have an infection or signs of organ deterioration. After adjusting for patient characteristics, patients who triggered an alert during the live phase of the system had 24% lower odds of in-hospital death (odds ratio 0.76 (95% confidence interval 0.70 to 0.84)) than patients in the control phase of the study. Anne Kinderlerer, a consultant rheumatologist at Imperial College Healthcare NHS Trust and co-author of the study, said, "The findings from this study show that the alert has made a significant impact on identifying more cases of sepsis and reducing the number of patients who die in hospital as a result."

**Database:** BNI

**Patient and health-care factors associated with potentially missed acute deterioration in primary care: a retrospective observational study of linked primary and secondary care data**

**Author(s):** Cecil, Elizabeth; Bottle, Alex; Majeed, Azeem; Paul, Aylin

**Source:** The Lancet; Nov 2019; vol. 394 ; p. S30

**Publication Date:** Nov 2019

**Publication Type(s):** Conference Proceedings

Available at [The Lancet](#)

**Abstract:** Background In the UK, the majority of patient contact with health services occurs in primary care. Most of these contacts are uncomplicated; however, patient safety incidents (eg, failure to recognise patient deterioration) can occur. We aimed to explore patient and health-care factors associated with a self-referred admission, in patients with deteriorating health who consulted a general practitioner (GP). Methods In this observational study, we identified patients who had consulted a GP in the 3 days before an unplanned admission (indication of deterioration) between April 1, 2014, and Dec 31, 2017, in England, using the Clinical Practice Research Datalink with linkage to inpatient hospital admissions and emergency department data. We applied a multivariable, multilevel logistic regression model (generalised estimating equations) to investigate factors associated with self-referral (ie, patient age and existing health conditions, GP consultation, deteriorating health condition, and previous health service use) compared with other-referred unplanned admissions (eg, GP-referrals). Self-referred admission, as a composite measure, was defined as an unplanned admission via the emergency department (inpatient data) recorded as a self-referral in the corresponding emergency department record. We investigated all diagnoses and a subset of commonly reported missed conditions: sepsis, pulmonary embolism, urinary tract infections, and ectopic pregnancies in women. Findings Of 405 878 unplanned admissions, 116 094 (28%) patients had contact with a GP 3 days before admission. The proportion of self-referred admissions varied by region (4189 [31%] of 13 639 inpatient admissions in London vs 1721 [12%] of 14 641 inpatient admissions in south west England), age, deteriorating health, and existing health conditions. Patients with sepsis or a urinary tract infection were more likely to self-refer than patients with other conditions (adjusted odds ratio [OR] 1·10, 95% CI 1·02–1·19 for sepsis; 1·09, 1·04–1·14, for urinary tract infection). GP appointment length was associated with a self-referred admission: a 5 min increase in consultation duration decreased the risk of self-referral by 6% (OR 0·94, 0·91–0·97). Telephone consultations, comorbidity, and previous health service use were also associated with self-referred admission. Interpretation Differentiating deterioration from self-limiting conditions is difficult for GPs, particularly in patients with sepsis, urinary tract infections, or long-term conditions. The negative association between GP consultation duration and self-referral supports demand for longer GP consultations. However, more research is needed to investigate the underlying mechanism between GP consultation time and referral. Funding National Institutes for Health Research.

**Database:** BNI

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**Improving 3-Hour Sepsis Bundled Care Outcomes: Implementation of a Nurse-Driven Sepsis Protocol in the Emergency Department**

**Author(s):**

**Source:** Journal of Emergency Nursing; Nov 2019; vol. 45 (no. 6); p. 690

**Publication Date:** Nov 2019

**Publication Type(s):** Journal Article

**Abstract:** Problem Sepsis, a life-threatening condition, can rapidly progress to death. The Hospital Inpatient Quality Reporting program has implemented bundled care metrics for sepsis care, but timely completion of these interventions is challenging. Best-practice interventions could improve patient outcomes and reimbursement. The purpose of this project was to improve the timeliness of sepsis recognition and implementation of bundled care interventions in the emergency department. Methods This evidence-based practice improvement project implemented a Detect, Act, Reassess, Titrate (DART)-based nursing protocol

embedded within a checklist communication tool in the emergency department of a tertiary level-2 trauma center. Data comparisons between preintervention and post-DART protocol/checklist implementation included compliance with the individual Inpatient Quality Reporting 3-hour bundled elements, number of hospital days, and time to screen. Staff also completed a survey designed to assess their satisfaction with the DART algorithm/checklist. The Pearson  $\chi^2$  test was used to assess bundled-care intervention variables. Wilcoxon rank sum tests were used to explore hospitalization outcomes. Staff satisfaction survey results were summarized. Results Improvement was statistically significant for lactate levels, blood cultures, and early antibiotic administration in the intervention period compared with baseline. Time to screen, ED length of stay, and number of hospital days improved between baseline and the intervention period, with an average number of hospital days decreasing by 2.5 days. Compliance with all Inpatient Quality Reporting metrics increased from 30% to 80%. Discussion When the nurse-driven protocol and communication tool were implemented, compliance with time-sensitive sepsis bundled interventions improved significantly. The outcomes suggest nurse-driven protocols can improve sepsis outcomes.

**Database:** BNI

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### **Implementation of a Vital Sign Alert System to Improve Outcomes**

**Author(s):** Huff, Shelly, DNP, MBA, RN, NE-BC; Stephens, Kimberly, DNP, RN; Whiteman, Kimberly, DNP, RN; Swanson-Biearman, Brenda, DNP, MPH, RN; Mori, Candy, MSN, RN, ACNS-BC, ONC

**Source:** Journal of Nursing Care Quality; 2019; vol. 34 (no. 4); p. 346

**Publication Date:** 2019

**Publication Type(s):** Journal Article

**Abstract:** Background: Patients at risk for clinical deterioration often show changes in vital signs up to 24 hours before a critical event. Use of modified early warning scores has demonstrated effectiveness in identifying patients at risk for clinical deterioration and improving outcomes. Local Problem: Documentation of vital signs, timely recognition of clinical deterioration, and compliance with the sepsis bundles remained a challenge. Methods: An inter-professional team developed an electronic vital sign alert (VSA) system with a concurrent running sepsis screen, along with clinical protocols. Interventions: Education was provided and the VSA system was implemented on 3 nursing units. Results: After implementation, the number of unplanned transfers to the intensive care unit increased. Mortality rate and length of stay in the intensive care unit for patients transferred for respiratory failure and sepsis significantly decreased. There was a 21% increase in identification of sepsis. Conclusions: The VSA system was an effective tool to identify patients at risk for clinical deterioration and help to improve outcomes.

**Database:** BNI

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### **Impact of timing to source control in patients with septic shock: A prospective multi-center observational study**

**Author(s):** Kim, Hongjung; Sung, Phil Chung; Choi, Sung-Hyuk; Kang, Gu Hyun; Tae Gun Shin; Kyuseok Kim; Park, Yoo Seok; Kap Su Han; Han Sung Choi; Suh, Gil Joon; Won Young Kim; Tae Ho Lim; Byuk Sung Ko

**Source:** Journal of Critical Care; Oct 2019; vol. 53 ; p. 176

**Publication Date:** Oct 2019

**Publication Type(s):** Journal Article

**Abstract:** Purpose Current guidelines recommend that rapid source control should be adopted in patients not >6–12 h after sepsis is diagnosed. However, evidence level of this guideline is not specified, and there is no previous study on patients with septic shock visiting the emergency department (ED). Therefore, we aimed to assess the impact of rapid source control in patients with septic shock visiting the ED. Materials

and methods In a prospective, observational, multicenter, registry-based study in 11 EDs, Cox proportional hazards model was used to assess the independent effect of source control and time to source control on 28-day mortality. Results Cox proportional hazard models revealed that 28-day mortality was significantly lower in patients who underwent source control (HR 0.538 (0.389–0.744),  $p < .001$ ). However, no significant association between the performance of source control after 6 h or 12 h from enrollment and 28-day mortality was noted. Conclusions Patients with septic shock visiting the ED who underwent source control showed better outcomes than those who did not. We failed to demonstrate the performance of rapid source control reduced the 28-day mortality in septic shock patients. Further studies are required to determine the impact of rapid source control in sepsis and septic shock.

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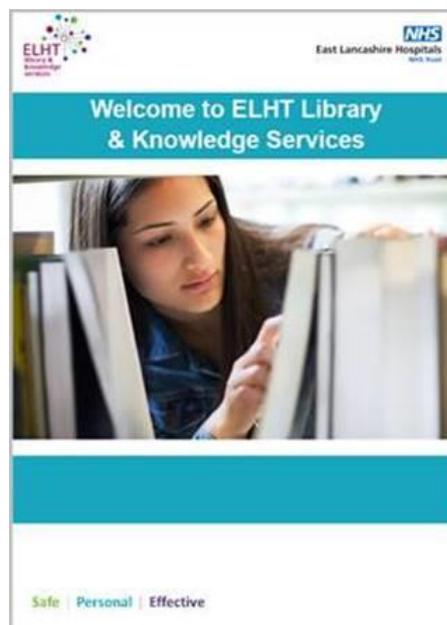
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