

### Purpose

- Sepsis, severe sepsis, and septic shock (hereafter referred to collectively as sepsis) are significant contributors to pediatric morbidity and mortality.
- In 2005, international guidelines were developed recommending the upper-temperature threshold of 38.5C as a systemic inflammatory response syndrome (SIRS) criterion to screen for pediatric sepsis<sup>1</sup>.
- This review examined our institution's more sensitive limit of 38.0C for pediatric sepsis screenings to determine if a more sensitive threshold was supported by clinical evidence as a positive predictor for the presence of sepsis.

### Design

- This quality assurance project was a retrospective analysis of patient data to determine if the adoption of international guidelines over our institution's standard would influence the sensitivity and specificity of a nursing-administered pediatric sepsis screening tool.

### Setting

- The settings were a tertiary/quaternary academic medical center and a complex teaching hospital providing comprehensive pediatric care, ranging from routine services to highly-specialized treatment for acute and complex diagnoses.

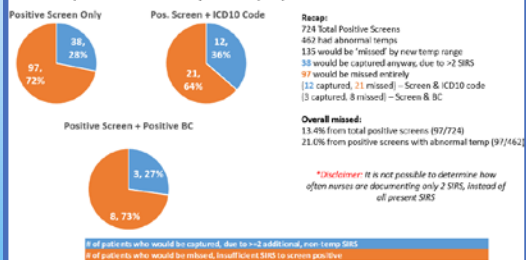
### Participants/Subjects

- The population comprised of pediatric patients (<18 years old) admitted in the calendar year 2017 who had a positive sepsis screen.
- For inclusion, a patient must have two or more SIRS criteria and suspected or confirmed infection.
- The first positive screen for any given encounter was examined.
- This dataset was cross-referenced with a secondary query of all patients with a positive blood culture(s), regardless of sepsis screening status.
- Patients in the Neonatal Intensive Care Unit and those lacking abnormal temperatures were excluded.
- All patient data were reviewed within the encrypted and HIPAA-compliant infrastructure of the health system.

### Methods

- This was a retrospective review of patient records meeting inclusion criteria queried from an Epic Clarity database.
- Temperature value captured concurrently with sepsis screen preferred.
- Median absolute time from screening to temperature capture = two minutes.
- Patients identified with abnormal temperatures and a positive screen were compared using the presence of sepsis ICD-10 codes, positive blood cultures, and physician clinical impressions to determine which patients had "true" sepsis incidents and whether patients would be missed with a different temperature threshold.
- Inter-rater reliability was maintained through the use of consistent abstractors.

### Of the 135 total patients who would be "missed" by less sensitive temperature ranges, how many would have been captured anyways due to 2 or more additional SIRS?



### Results/Outcomes

- Nearly a third (135 of the 462) of patients with a positive screen had a temperature between 38.0-38.4C.
- Of the 135, 38 (28%) would have screened positive for sepsis based on other SIRS criteria.
- 97 (72%) patients would have screened negative with the higher temperature threshold and therefore, would have been missed.
- 8 of 28 (29%) patients with a positive blood culture(s) would have screened negative for sepsis using the 38.5C threshold instead of 38.0C.
- Findings are supported by assessments of sepsis presence, ICD-10 codes, blood cultures, and physician clinical impressions.

### Implications

- The data support the use of a temperature threshold less than 38.5C in pediatric sepsis screenings.
- Use of 38.0C demonstrated similar specificity to the 38.5 threshold, but greater sensitivity.
- Our investigation supports the use of a more sensitive temperature range.
- Further research into appropriate temperature values in the detection of pediatric sepsis cases may be warranted.



### Resources

- Goldstein, B., Giror, B., & Randolph, A. (2005). International Pediatric Sepsis Consensus Conference: Definitions for Sepsis and Organ Dysfunction in Pediatrics. *Pediatric Critical Care Medicine*, 6(1), 99.
- Hartman, M. E., Linds-Zwirble, W. T., Angus, D. C., & Watson, R. S. (2013). Trends in the Epidemiology of Pediatric Severe Sepsis. *Pediatric Critical Care Medicine*, 14(7), 686-693.
- Ruth, A., McCracken, C. E., Fortenberry, J. D., Hall, M., Simon, H. K., & Hebbbar, K. B. (2014). Pediatric Severe Sepsis. *Pediatric Critical Care Medicine*, 15(9), 828-838.
- Dhochak, N., Kumar, K., Sankar, J., & Lodha, R. (2018). Abstract P-187: Sepsis-3 vs International Pediatric Sepsis Consensus Conference Definitions for Identifying Children with Septic Shock which one to use?. *Pediatric Critical Care Medicine*, 19, 105.

Suspect sepsis.  
Save lives!



### Contact Info

- Kerry Gold - [KTsakonas@mednet.ucla.edu](mailto:KTsakonas@mednet.ucla.edu)
- Carson Del Greco - [cdelgrec@gmail.com](mailto:cdelgrec@gmail.com)
- Summer Gupta - [SCGupta@mednet.ucla.edu](mailto:SCGupta@mednet.ucla.edu)
- Leah Nubla - [LNubla@mednet.ucla.edu](mailto:LNubla@mednet.ucla.edu)
- Ashley Trueblood - [Atrueblood@mednet.ucla.edu](mailto:Atrueblood@mednet.ucla.edu)