

## Background

- Severe sepsis is a deadly yet common syndrome characterized by organ dysfunction in the presence or suspicion of infection
- Severe sepsis and septic shock are increasing in incidence and prevalence, affecting millions of people around the world each year (Lagu et al., 2012)
- The Surviving Sepsis Campaign (SSC): International Guidelines for Management of Severe Sepsis and Septic Shock, outlines time sensitive measures critical for optimal care outcomes
- Screening for the early detection of sepsis and rapid implementation of early evidence-based therapies has been well documented in the literature to improve outcomes and decrease mortality
- UCSF Medical Center identified sepsis screening and review of sepsis care bundles as opportunities to improve standard processes
- The CNS is in an ideal position to lead an interprofessional team in a systems level change to implement sepsis screening and the SSC guidelines

## Purpose

- Early identification of patients with sepsis
- Standardize workflows to deliver evidence based guidelines to improve sepsis bundle completion
- Utilize existing nursing documentation and processes to perform surveillance and streamline communication for emergent situations
- Incorporate frontline staff to optimize workflows and identify opportunities for improvement related to bundle compliance

## Design & Methods

### CNS led Sepsis Leadership committee

- Sepsis CNS: project manager
- Sepsis medical director
- Population based CNSs
- Frontline nurse and provider champions
- Nursing unit directors
- Quality analyst
- Pharmacy

### CNS integral in design of electronic surveillance

- Alert configuration, design and optimization to decrease alert fatigue
- Systems improvement:
  - Lactate protocol development
  - Antibiotic availability
  - Code Sepsis process
- Frontline clinician education
- Implementation: coordination with leadership and Sepsis Champions

### Challenges

- Capture documentation for changes in mental status due to sepsis
- Configure alert to exclude patients with clinical conditions mimicking sepsis
- Ongoing educational effort with new staff across multiple disciplines on sepsis surveillance system and alert interaction
- Adapt the surveillance system to keep pace with an evolving Core Measure and revisions to metric specifications and requirements

## Nursing Electronic Surveillance Workflow

**SIRS Best Practice Advisory:** Patient meets criteria linked to systemic inflammatory response syndrome (SIRS) and the early stages of sepsis. Trigger points based on existing flowsheet documentation or lab values.

The image shows two screenshots from the EHR. The top screenshot is an 'Important (Advisory: 1)' alert titled 'SIRS Best Practice Advisory'. It states: 'SIRS (Systemic Inflammatory Response Syndrome) This patient has been screened for 2 or more SIRS criteria'. It lists criteria: 'Click for Infection EVAL and Lactate Order' for further sepsis assessment, and 'If VS are due to other clinical reason(s) select "Known Condition or Activity" and click ACCEPT to silence alert for 4 hrs.' It shows vital signs: Temp: 38 °C, Heart Rate: 120, Resp: 20. A button 'Click for Infection EVAL and Lactate Order' is visible. The bottom screenshot is the 'SIRS Evaluation - SIRS Worksheet'. It asks 'Is there suspicion of new or worsening infection?' with 'Yes' and 'No' options. A red banner at the bottom says 'Place Lactate Order "Per Protocol-Cosign Required" if New or Worsening Infection is Suspected'. A 'Lactate Results' field shows '(The last result from past 24 hours) None'.

### 2\* of the following vital signs trigger alert

- HR >100 Temp >38.3°C and <35.5°C
- RR >23 WBC <4 and >12

\*3 vital signs on the cardiovascular unit; malignant hematology unit excludes WBC

### Infection EVAL and Lactate order

- If RN suspects new or worsening infection

### Lock-out timeframes assist with alert fatigue

- Known Condition or Activity**
  - VS due to other clinical process
  - Silences alert for 4 hours
- Chart Review/Audit**
  - Silences alert for 4 hours for individual user

### Infection EVAL and Lactate Order

- Links out to questions about infection and source to evaluate for sepsis
- No** response silences alert for 12 hours, can be utilized for patients on comfort care
- Yes** response and a lactate result not present further decision support prompts RN to place lactate order per protocol

**Severe Sepsis Best Practice Advisory:** Patient meets signs of SIRS plus one or more end organ dysfunction criteria. Trigger points based on existing flowsheet documentation or lab values.

The image shows two screenshots. The top screenshot is a 'Very Important Alert (Advisory: 1)' titled 'Best Practice Advisory Sepsis'. It states: 'This patient may have SEVERE SEPSIS +/- SEPTIC SHOCK'. It lists criteria: 'Click for Lactate Order and Code Sepsis Link' for further severe sepsis assessment, 'Draw & send lactate to blood gas lab (if not already sent) per protocol', 'Notify Primary Treatment Team immediately', and 'If VS are due to other clinical reason(s) select "Known Condition or Activity" and click ACCEPT to silence alert for 4 hrs.' It shows vital signs: Temp: 38 °C, Heart Rate: 120, Resp: 20, End Organ Dysfunction BP: 80(40). A button 'Click for Lactate Order and Code Sepsis Link' is visible. The bottom screenshot is the 'RN Sepsis Worksheet - Sepsis Worksheet'. It asks 'Do you suspect this patient has a new or worsening infection?' with 'Yes' and 'No' options. A red banner at the bottom says 'Place Lactate Order "Per Protocol-Cosign Required" if New or Worsening Infection is Suspected'. A 'Lactate Results' field shows '(The last result from past 24 hours) None'.

### End organ dysfunction criteria

- CV: lactate >2; SBP<90; SBP Δ >40mmHG (acute & transitional care)
- Liver: tbili >4
- Resp: O2 sat <90%
- CNS: LOC documentation
- Renal: Creat >2 (exclusions for CRRT, HD)

### Lactate order and Code Sepsis link

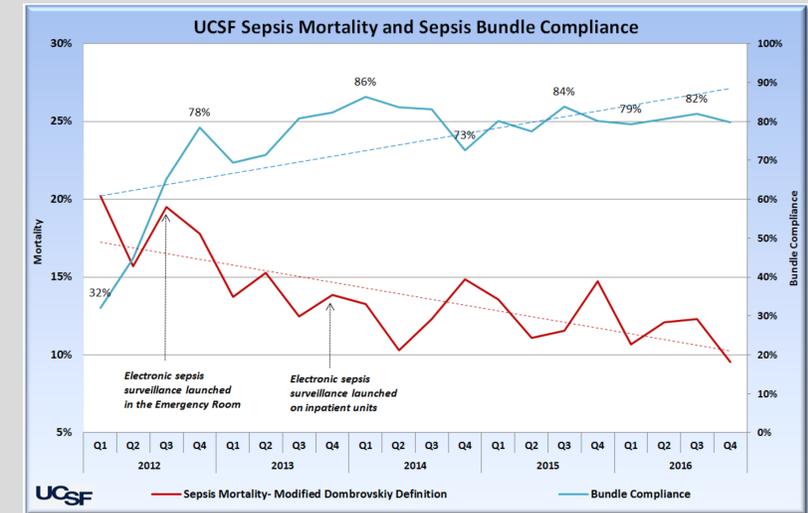
- If RN suspects new or worsening infection
- Links out to Code Sepsis activation

### Lock-out timeframes assist with alert fatigue

- Currently being treated for sepsis**
  - Patients currently being treated or have received sepsis bundle elements within previous 24 hours
  - Silences alert for 12 hours

### Code Sepsis activation

- No identifiable source of infection**
  - Includes patients on comfort care
  - Silences alert for 12 hours
- Lactate draw- Further evaluation**
  - Decision support prompts RN to place lactate order per protocol
- Code Sepsis**
  - Team responds to the bedside for suspicion of new or worsening infection
  - ICU NP
  - Rapid response team
  - Sepsis project manager & project analyst
  - Pharmacy by phone



## Implementation for Success

### Development of alert

- Interprofessional team led by CNS to leverage EHR data incorporating continuous sepsis screening
- Partnership between CNS and unit based Sepsis Champions to tailor sepsis education to unit patient population
- Analysis of alert data to refine workflow processes prior to go live

### Alert go-live

- Proactive rounding to perform just-in-time training and gather feedback
- CNS led weekly phone conference meetings to address system issues
- Sepsis alert optimization to reduce alert fatigue
- Frontline clinician feedback to improve alert user interface

### Empowering frontline staff with data

- Interprofessional team developed an analytic tool to display sepsis bundle compliance
- Data is displayed at the patient and unit level providing Sepsis Champions information to drive change to improve patient outcomes
- Analytic tool transitioned data review from retrospective to concurrent case review providing opportunities for feedback to the clinical team often while the patient is still hospitalized

### Pillars of success

- CNS led sepsis surveillance program utilizing existing EHR data increased sepsis care bundle compliance
- Frontline clinicians assisted in workflow adoption and success
- Proactive CNS rounding identified system issues and knowledge gaps

## References

- Lagu, T., Rothberg, M.B., Shieh, M.S., et al. (2012) Hospitalizations, costs, and outcomes of severe sepsis in the United States 2003 to 2007. *Critical Care Medicine*, 40:754-761
- Rhodes, A., Evans, L.E., Alhazzani, W. et al. (2017). Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Intensive Care Medicine*, 1-74.

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