Leveraging the Electronic Medical Record to Ensure Sepsis Success

John T. Mather Memorial Hospital
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- Mather is a 249 bed community hospital located on the North Shore of Suffolk County, Long Island
- The Emergency Department (ED) receives 42,000 visits per year
- Most sepsis cases present through the ED
- Our admission rate from the ED = 25% reflecting a largely elderly population with multiple comorbidities
- Hospital averages 12,000 discharges per year
- Mather provides all services, including adult and adolescent psychiatry, except no inpatient pediatrics or obstetrics
Hospital Sepsis Team – The “Toxic Avengers”

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The Toxic Avengers
Early Recognition of Sepsis in ED Triage

- Early recognition of patients presenting through ED Triage is critical
- ED providers are alerted to initiate Sepsis Bundle
- Frontline nursing staff engagement is necessary to implement orders
- The EMR is leveraged to assist in tracking progression of septic patients
- Improved monitoring of septic shock patients results with early recognition
Project Implementation

○ EMR
  ○ Introduced triage triggered alert tool and identified septic patients
  ○ EHR sepsis screening tool
  ○ Sepsis order set bundle with repeat lactate
  ○ Sepsis antibiotic bundle

○ Education
  ○ Sepsis Education module through eLearning system (planned)
  ○ RN Mandatory education: High fidelity simulation: timely identification & bundle implementation >> improvement vs failure to act >> code

○ Engagement
  ○ Engaged staff during huddles and meetings
Screening Tool and Sepsis Bundle

- **Sepsis Pop-up Alert** - triggered by “Yes” choice to question from Triage Note “suspected infection?” plus 2 positive SIRS vital signs

![Sepsis Alert]

- **ED Tracking Board Identifier** – purple ball icon

![ED Tracking Board]

- The EMR is programmed to automatically order a repeat lactate level in 3 hours if the initial lactate is ≥ 2.0
Screening Tool and Sepsis Bundle

- **Screening Tool in EHR**

  - **Sepsis Screening**
    - **Does the Patient have Suspected Infection?**
      - Yes...  
      - No
    - **Infection Type**
      - Pneumonia, empyema
      - Urinary tract infection
      - Acute abdominal infection
      - Meningitis
      - Skin/soft tissue infection
      - Bone/joint infection
      - Wound infection
      - Line infection
      - Endocarditis
      - Implantable device infection
      - Unknown
    - **Signs and Symptoms**
      - No criteria present
      - Temp greater than 100.9 degrees F/38.3 degrees C
      - Temp less than 96.8 degrees F/36 degrees C
      - Heart rate greater than 90 beats/min
      - Respiratory rate greater than 20 breaths/min
      - Acutely altered mental status
    - **Abnormal Lab Values**
      - No criteria present
      - Plasma glucose greater than 120 mg/dL in non-diabetic
      - WBC count greater than 12,000 ul.
      - WBC count fewer than 4,000 ul
    - **Raw Score**
    - If Score 21 or Greater, Suspicion of Sepsis is Present
    - **Signs of Organ Dysfunction**
      - No criteria present
      - Systolic BP less than 90 mm Hg
      - Systolic BP decrease 40 mmHg from baseline
      - PaO2/FIO2 ratio less than 300
      - Mean arterial pressure less than 65 mmHg
      - Bilateral pulmonary infiltrates
      - Increase in O2 required to maintain SpO2 of 90%
      - Creatinine greater than 2.0 mg/dL
      - Bilirubin greater than 2 mg/dL
      - Platelet count less than 100,000 ul.
      - Coagulopathy
      - Lactate greater than 2mmol/l.

- **Sepsis Bundle includes labs, IV Fluids, Antibiotics Protocol**
Septic Shock Documentation – Pressor Order Trigger

Is this Septic Shock?

Yes  No

Alert Information

SEPTIC SHOCK NOTE is Required

Septic Shock note must be completed to continue with this order. Click on the 'Add Document' button below to go directly to the note.

Acknowledgement Comment: Add Document

RESPIRATORY and SKIN

- RESPIRATORY
  - patent airway
  - clear to auscultation
  - normal breath sounds

- CARDIOVASCULAR
  - regular rate
  - regular rhythm
  - irregular rhythm
  - normal S1 and S2
  - no murmur

- CAPILLARY REFILL
  - capillary refill < 2 sec
  - capillary refill > 2 sec

- DORSALIS PEDIS
  - dorsalis pedis pulse normal
  - dorsalis pedal pulse abnormal

- SKIN
  - mottled
  - flushed
  - diaphoretic
  - turgor good
  - turgor poor
  - color normal
  - pale
  - pink
  - cyanotic
Successful Strategies & Tips

- Hardwire the EMR as much as possible
- Share strategies with other hospitals, especially those with the same EMR
- Develop meaningful reports to track data related to each stakeholder’s processes and workflows
- Sepsis review/case discussions at staff meetings
- Circulation of data and DOH/CMS reports
- Keep Administration/Board aware of Sepsis activities/outcomes
Challenges & Barriers

- Limited Information Services resources to implement EMR updates and clinician feedback reports
- Documentation of sepsis criteria and fluid administration
- Reevaluation/assessment of patients included in 3 and 6 hour bundles
- Timely ordering and early administration of antibiotics
- Concerns of fluid overload
Key Lessons Learned

- An ED Code Sepsis protocol is essential
  - Early recognition
  - Prompt antibiotic/fluid orders
  - Timely administration of fluids and antibiotics

- Continuous training and education of all staff is required

- Need to provide timely feedback to individual clinicians regarding their performance
Outcomes & Data

CMS Sepsis Adherence Early Management Bundle

- MIDAS Benchmark: 47.5%
- 2nd Q 2016: 46.3%
- 3rd Q 2016: 54.4%
- 4th Q 2016: 83.9%
- 1st Q 2017: 87.0%

Trended Mortality Percentages

- 2nd Q 2016: 17.5%
- 3rd Q 2016: 19.8%
- 4th Q 2016: 26.3%
- 1st Q 2017: 26.0%

- 2nd Q 2016: 26.4%
- 3rd Q 2016: 25.8%
- 4th Q 2016: 26.3%
- 1st Q 2017: 23.0%

Hospital Statewide

October/November 2017
Steps for Hardwiring & Spread

- Build Sepsis Education module into hospital eLearning system
- Implement suggested EMR updates to improve lactate evaluations, Sepsis Scale area in ED Provider Note and add links to Sepsis order set in Rapid Response order set
- EMR Modified Early Warning Scoring System (MEWS) to alert nurses to patient decline in condition and a pilot study in progress
- Work with analysts to provide feedback on providers’ performance
Contact Information

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