Streamlining Sepsis Initiative

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Intro

- Disclosures
  - None

- Our research is IRB approved
Background\textsuperscript{1-9}

Sepsis\textsuperscript{1,2}
- 1 million cases annually
- In-hospital mortality 14.7\% - 29.9\%
- $17$ billion nationally

- Surviving Sepsis Campaign\textsuperscript{1}
- Treatment barriers\textsuperscript{5-9}
  - Resources
  - Recognition
  - Treatment modalities
Background

• 2011 - Lakeland Health announces a transition from paper charting to electronic based medical records
  • 80,000 patient/year community ED

Adapting Technology to Healthcare
• How can we use this technology to improve
  – medical staff workflow
  – patient centered care
  – medical outcomes
Early Recognition

• Earlier recognition > earlier therapies = improved patient outcome\textsuperscript{10,11}

• Goal
  • To recognize sepsis from the onset of hospitalized care

• How
  • Creating an identification tool used during ED triage
Parametric Tools

• We can use technology for patient care by encoding evidence based parameters

• SIRS criteria$^1$
  - HR > 90 bpm
  - RR > 20 brpm or PaCO$^2$ > 32 mmHg
  - Temp > 38$^\circ$C; < 36$^\circ$C
  - WBC > 12k; < 4k; >10% bands
Best Practice Advisory

• BPA
  – Using SIRS parameters we encoded a “hard stop” medical alert into our EMR
  – June 1, 2013 implementation
Clinical Question

• Will the implementation of an electronic medical record based sepsis identification tool in the emergency department lead to earlier sepsis treatment?
Methods

- A retrospective cohort study of clinically effectiveness
- 3,076 patients
- Patient charts were identified for this study who met the criteria of: ≥18 years old; emergency department evaluation; ICD-9 code of sepsis, severe sepsis, or septic shock.

- 2 treatment groups: pre- and post-BPA
  - Treatment in each group was unchanged and followed SSC guidelines tailored to our institutional resources.

- Outcomes:
  - Primary: time from emergency department arrival to intravenous fluids and antibiotics
  - Secondary: in-patient mortality
Results

• Time to IV fluids in the first 60 minutes of ED arrival improved from 34% to 49.9
  • (difference of 15.9%; P value <.05)

• Time to antibiotics in the first 180 minutes of arrival improved from 40.3% to 56.8
  • (difference of 16.5%; P value <.05)

• Analyzed data via 2-tailed chi² test
Secondary Outcome

- 1,266 patients treated pre-BPA and 1,810 post-BPA with in-patient mortality 10.5% and 7.5%, respectively
  - (difference of 3%; P value < .05)
Mortality Comparison

Sepsis In-Patient Mortality

EMR

BPA

EMR go-live: February 2012
BPA go-live: June 1, 2013

LRHS Mortality Rate
National Average Mortality Rate
Top Decile Mortality Rate
Conclusion

• Our study has demonstrated effective earlier implementation of sepsis therapy.
• This earlier treatment correlates with the utilization of an electronic sepsis identification tool in the emergency department that may have contributed to decreased mortality of septic patients.
Discussion

• Generalizability and Validity concerns
  – Retrospective approach
  – Recent studies have shown that a tight sepsis protocol is not necessary to improve survival, but that earlier recognition and treatment of sepsis may be.\textsuperscript{10,11}
  – We believe that this is why improvement in mortality was demonstrated in our study.
Discussion Cont

• Similar parametric tools have been employed for stroke and ACS

• We are benefiting our community by utilizing technology as an active clinical tool.
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References


