Improving Timeliness of Antibiotic Administration for Sepsis Patients in the Emergency Department

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Problem

Each hour of delay in antibiotics increases mortality—up to **50%** in septic shock.

Emergency Departments worldwide struggle to meet sepsis benchmarks due to:

1) Variable sepsis presentation
2) Comorbidities mimicking sepsis
3) Unclear presence of infection

PURPOSE Statement:

Implement evidence-based strategies to reduce delays in antibiotic administration for adult patients that present to the ED with sepsis.

Available Knowledge

- Gained in-depth knowledge of barriers and best practice for early sepsis recognition and treatment
- Analyzed large and small-scale studies to understand gaps and effectiveness.
- Identified importance of multidisciplinary collaboration, sepsis screening tools, and timely interventions to enhance care delivery
- Applied EBP in support of protocol development, compliance drive, and core sepsis measures.
- Strengthened leadership and decision making skills

Methods

❑ **Context**:

- 24- bed urban Emergency Department
- 60 RN's on staff (30 triage, 30 bedside)
- ~ 31,000 patients /year, all ages
- ~20--40 documented cases/month
- ~10 meet full criteria/ month

❑ **Intervention:**

- *Triage Sepsis Screening (TSS) Tool* implemented into triage

--30 day trial | Paper-based | located in 2 triage rooms

- *Staff Education*

--In-person: daily huddle | core meetings
-- Sepsis flyer: breakroom | email.

❑ **Study of Intervention & Measures**

- Pre-Post Study design utilized for:

--*Evaluating* TSS Tools impact on timely antibiotics
--Assessing nurse knowledge and confidence

Data Collection: Patient Outcomes:

- EMR sepsis reports using sepsis advisor documentation.
- Manual chart audits to eliminate false positives
- Key time intervals analyzed:

Blood culture collection → Antibiotic start
Antibiotic order entry → Antibiotic start
Sepsis alert time → Antibiotic start

Staff Knowledge and Confidence Evaluation:

- Staff surveys via SurveyMonkey:
  -- 4 Multiple choice (knowledge)
  --5 Likert Scale (confidence)

Pre survey | *2 weeks prior to education* || Post- survey | *30 days after intervention*

The Iowa Mode of EBP was the framework chosen to guide this project

Data Analysis

Software used for data collection:

- Microsoft Excel

Survey Matching and Analysis :

- *Unique PIN created by each staff member.*

Statistical Methods:

- *Independent samples t- test | Survey data*
- *Descriptive statistics | individual knowledge questions*

Results

Patient Volumes:

- 2,989 patients seen in the ED during 30-day intervention period.
- 41 Tools completed | 8 positive | 0 true positives

Sepsis Advisor Data:

Pre- Intervention (30 days)

- 20 sepsis advisors generated | 5 true positives

Post -intervention (30 days)

- 14 sepsis advisors generated | 5 true positives

Outcomes: no statistical analysis performed due to low correlating data.

Confidence Survey Results:

Confidence Total

Pre Survey *M* (*N = 15*)	Pre Survey *SD* (*N = 15*)	Post Survey *M* (*N* = 3)	Post Survey *SD* (*N* = 3)	*df*	*p*	*t*
17.2	1.93	17.67	2.08	1	0.79	13

Not statistically significant

Knowledge Survey Results:

Knowledge total

Pre Survey. M. (N = 15)	Pre Survey. SD (N = 15)	Post Survey. M (N = 3)	Post Survey. SD (N = 3)	*df*	*p*	*t*
3.36	1.05	3.5	0.58	2	0.83	4.3

Individual Knowledge Question Analysis: Not statistically significant

- Statistically significant improvement in knowledge of antibiotic administration timeframes.
- Pre- survey ($M = 0.73$, $SD = 0.46$), | Post- survey ($M = 1.00$, $SD = 0.00$), ($t = 2.14$, $p = .04$, $df = 14$),

Discussion

Challenges:

- *Short 30- day intervention period*
- *Low staff engagement*
- *High-paced ED environment*
- *Paper-tool*

Strengths:

- *Address high-priority clinical issue*
- *Demonstrated feasibility of tool integration*
- *Used validated tools for assessment*
- *Education improvement in one key knowledge area.*

Limitations:

- *Single site, small sample size*
- *Low number of sepsis cases*
- *Incomplete data due to reliance of sepsis advisor*
- *Post-survey response rate low (n = 3)*
- *No demographic data*

Recommendations:

- *Extend intervention duration*
- *Use multiple sites for broader data*
- *Mandate in-person education*
- *Integrate TSS tool into EMR*
- *Improve leadership support and real-time feedback*

Conclusions

Highlights:

- Challenges of implementing early sepsis interventions in the high- volume ER.
- Underscored the need for improved engagement, longer intervention period, and system level support to achieve meaningful improvements in care.

Sustainability and future focus:

- Extend duration of intervention
- Expand to multiple sites with diverse populations
- Improve staff training and content delivery

Key Takeaways:

- Voluntary participation limits effectiveness.
- Clinical change is challenging within strong infrastructures.
- Context, engagement, and sustained effort are critical for success.

References

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