Scope of the Problem

**Pediatric Sepsis**
- **Is Common**: Affects 75,000 children per year in the US
- **Is Expensive**: Costs Americans $7.3 billion a year
- **Is Fast-Developing**: Can progress to death within 48-72 hours of onset; even one hour of antibiotic delay increases mortality
- **Is Fatal**: Takes the lives of 7,000 children per year (more than pediatric cancer); 1 in 3 survivors experiences long-term sequelae
- **Is Sneaky**: Presents differently than in adults and is missed 8% of the time in the emergency department (ED)

What can be done? Implementation of the **Surviving Sepsis Campaign** (SSC) 2020 pediatric clinical practice guideline & bundle of interventions: IV access, labs, fluid resuscitation, empiric antibiotic therapy, and vasopressors

In a large, Midwest, academic medical center’s ED, which serves patients across the lifespan:
- Intervention bundle completion times exceed 1-hour goal
- Nurses report a knowledge deficit related to the bundle
- The ED has relatively low volume of pediatric patients, impacting nurses’ pediatric-specific knowledge and skills

Project Implementation

**Justification for the Educational Module**
- Support for use of a sepsis bundle of interventions
- Use of tailored institutional protocols improves response time, decreases organ dysfunction, and reduces death by 5x in pediatric cases of severe sepsis/septic shock
- Adherence to Pediatric Advanced Life Support (PALS) sepsis guidelines led to 57% shorter hospital stay

Evidence for targeted, multimodal education:
- **eLearning** allows for greater participation and knowledge acquisition among pediatric ED healthcare providers
- **Face-to-face**, self-directed learning increases knowledge among ED nurses and benefits patient outcomes

**Creation of the Educational Module**

**Multimodal module components**:
- 10-minute, interactive, web-based, practice module via Pear Deck (a Google Slides add-on): based on a pediatric sepsis ‘escape room’ (UC Health-North, 2020) and revamped to fit a digital game-like format
- **Visual reinforcement**:
  - Flyer: posted around the unit ongoing reinforcement
  - Badge buddy: distributed for just-in-time reference
- **Advantages**:
  - Completed at participants’ pace on their own device
  - Able to pause and completed later

Included topics: SSC best practice recommendations, sepsis signs and symptoms, normal pediatric vital signs, institution-specific sepsis bundle, and policy on difficult IV access

**Implementation of the Educational Module**

The module deployment involved 2 options:
- On-unit face-to-face sessions with module accessible via QR code (predominant method)
- Authors on hand for discussion, troubleshooting, and further explanation

Virtual independent module, accessible via emailed link
- On-unit time spanned 40 teaching hours over 7 days
- One-on-one or small group independently-paced learning
- Reinforcement with handouts, badge buddies, and treat bags

**Theoretical Framework**

**Ericsson’s Deliberate Practice Theory (DPT)**
- **Use of simulation and feedback to improve performance and achieve mastery**, especially in situations where real-time practice is unsafe or impractical
- DPT capitalizes on participants’ desire to improve mastery (win-motivated)

**Our Take**: Incorporate game-like elements into our web-based educational module in the form of a case study simulation which lets providers:
- Rehearse a clinical scenario
- Increase confidence in use of sepsis bundle interventions

ACKNOWLEDGEMENTS: Elisabeth Barrett DNP, APRN, FNP-C, CNL, Beth Day MSN, APRN, CONE, CONC-K, Joellen Wilbur PhD, RN, FAHA, FAAN, Hugh Vondracek MSc, GSB

**Evaluation & Outcomes**

**General Evaluation Measures**
- Module completion (independent and in-person options)
- Participants’ satisfaction with delivery of educational module
- Assessment of participants’ learning

**Analysis of Dependent Variables**
- **Quantitative**: 100-point Likert scale questions administered before and after the module, described via paired T-test
  - Confidence in ability to recognize instances of sepsis in pediatric patients
  - Confidence in knowledge of bundle of sepsis interventions
- **Qualitative**: Free response questions, coded via thematic analysis with 2 independent coders (discrepancies rectified by consensus)
  - Perceived barriers to bundle completion
  - Feedback and takeaways from the module

**Project Outcomes**
- Total reach = 61% (70/114) of ED nurses (63 in-person, 7 independent)

**Mean Confidence Scores Before and After Educational Module**

![Confidence Scores Before and After](image)

- **Confidence in sepsis recognition (n=63):** no meaningful change
- **Confidence in knowledge of bundle ↑ 73% (n=54):** statistically significant increase

Nurses’ Perceived Barriers to Sepsis Intervention Bundle (n=66)

- **No IV access**
- **Process delays**
- **Staffing**
- **Sepsis knowledge**
- **Patient needs**
- **Family needs**

**Recommendations**

**We Recommend That:**
1) This module be implemented with interdisciplinary teams within the ED setting to streamline treatment and eliminate process delays
2) Nursing leadership re-evaluate existing nurse-driven protocols that impact bundle implementation, such as timely intravenous or introsseous access
3) The hospital continue to support its providers and pursue best practices in the treatment of pediatric sepsis via implementation of emerging technologies, literature, and education