Improving Pediatric Sepsis Outcomes (IPSO) Change Package

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Disclosure

Today's presenters have confirmed they have no financial disclosures and no conflict of interest.

Objectives

1. Describe the purpose of the IPSO Change Package in spreading pediatric sepsis best practices.
2. Identify how to navigate and put the IPSO Change Package to best use.
3. Summarize two practical strategies for initial implementation of pediatric sepsis programming within an existing healthcare organization.

Information

- Follow along with the IPSO Change Package: https://sepsis.childrenshospitals.org

- Please see the chat for information about other common session questions.

- Please submit questions via the tab at the bottom of your Zoom window for Q&A following the presentation.

Improving Pediatric Sepsis Outcomes (IPSO) Change Package

Our Journey to Improve Pediatric Sepsis Outcomes

Mary Bridge Children's Hospital and Health Network

Grant Keeney, MD, MS

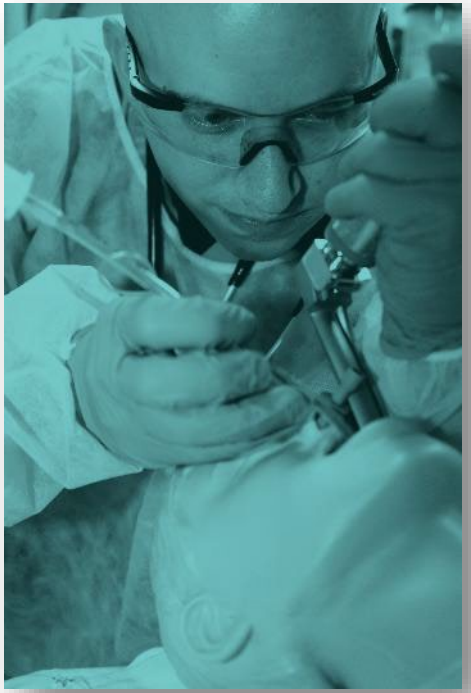
Medical Director, Quality and Safety

Mary Bridge Children's Hospital and Health Network in 2019

- Children's Hospital within a Hospital located in Tacoma, WA
- Part of a large health system (MultiCare), only Children's Hospital
- Teaching facility for pre-hospital providers, nursing students, and medical residents
- Level II trauma center serving southwest Washington
- Annual ED volume of 47,000+ patients
- 82-bed inpatient (PICU and med-surg units)
- Annual admissions of around 4,300

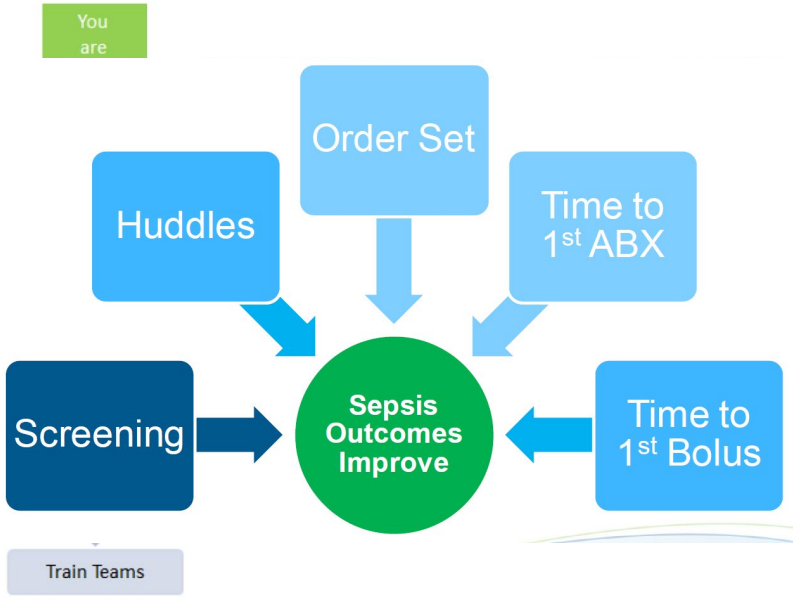
Sepsis at Mary Bridge

- Sepsis case review in our ED
- How well do we recognize, treat, and de-escalate treatment for sepsis?
- Are we different than other children's hospitals?
- Can we do better?
- Why are these questions so hard to answer?
  - In 2018, Mary Bridge had 44,000+ ED visits, and 4,200+ admissions
  - e.g. 31 patients had an ICD-10 code for severe sepsis



Our Sepsis Improvement Journey

- Joined CHA's IPSO Collaborative in Wave 3 (2019)
- Started from a blank slate
- Built our team
- Engaged our front-line
- Focused on the ED and on three priorities
  - Recognition
  - Timeliness of Antibiotics
  - Clinical Practice Guideline
- Took advantage of the collaborative nature of IPSO



The Journey Continues

- Success with implementing bundle locally
- Challenges faced along the way
- Spreading across a system
- Accelerated our own improvement efforts
  - Built on a body of research, guidelines, other's local implementation efforts
  - Achieved improvements more efficiently, at lower cost, and faster than we could have working independently

Another Sepsis Journey

Cincinnati Children's Hospital

Holly Depinet, MD, MPH

Director of Quality Improvement and Safety, Division of Emergency Medicine

Professor, Department of Pediatrics, University of Cincinnati College of Medicine

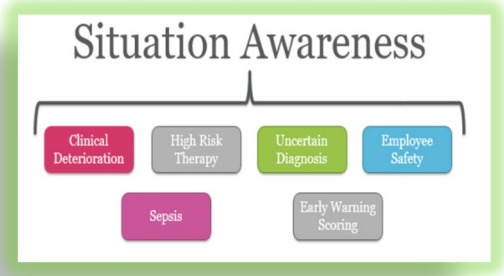
Another Sepsis Journey – Cincinnati Children's

- Children's Hospital – 90,000 ED visits; 34,400 admissions

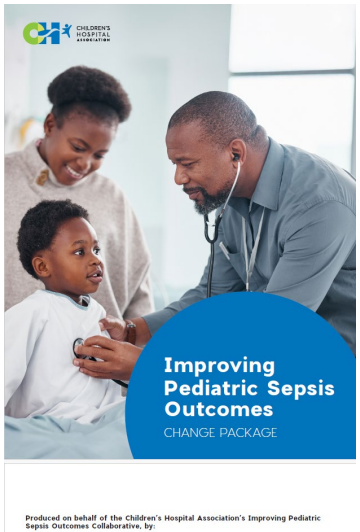
- **Sepsis work started in the ED** via the AAP's Pediatric Septic Shock Collaborative (2013)
  - Implemented screening BPA, huddle process, clinical pathway, orderset, education

- **Joined IPSO in 1st wave** with ED/PICU/Hosp Med/Heme-Onc as pilot units with plan to spread (2016)
  - Incorporated IPSO tools as well as novel interventions (Sepsis Escape Room, KPI huddles with all units, Flight Plan, daily case emails)

- Now incorporated into **institutional robust Situation Awareness** work
  - Reaches **units who rarely see sepsis**
  - Embedded in **watcher** discussion checklists
  - Inclusion in monthly SA case reviews
  - **Separate sepsis leadership** group reviews data, new evidence, pathways/order, education



What is the Change Package?



- A **toolkit to guide** sepsis improvement program development
- An overview of **best practices** (the bundle – recognition, fluids, antibiotics)
- A **data** quick-start guide
- A **library of tools** (from 66+ other hospitals!!)

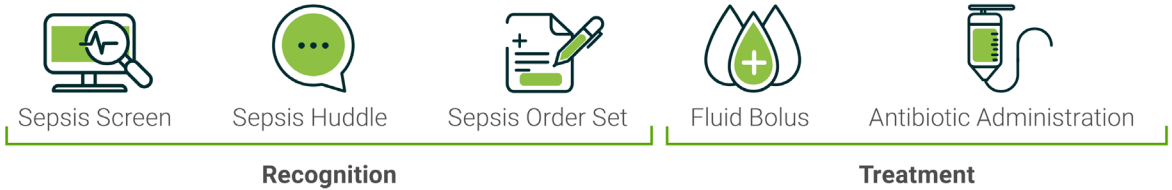
Getting started with the Change Package

Sepsis Bundle of Care

Overview

Pediatric Sepsis Bundle

- Five key processes:



- Compliance defined as:

Key Process	Threshold
Recognition	Positive screen, positive huddle, or order set utilization
Fluid bolus	Within 60 minutes of sepsis onset
Antibiotic administration	Within 180 minutes of sepsis onset

- Emphasis on All-or-None Bundle Compliance
- Improved outcomes with full bundle adherence

Bundle Compliance

Sepsis Recognition

Use of one or more of the following:

- positive sepsis screen
- and/or
- positive sepsis huddle
- and/or
- order set utilization

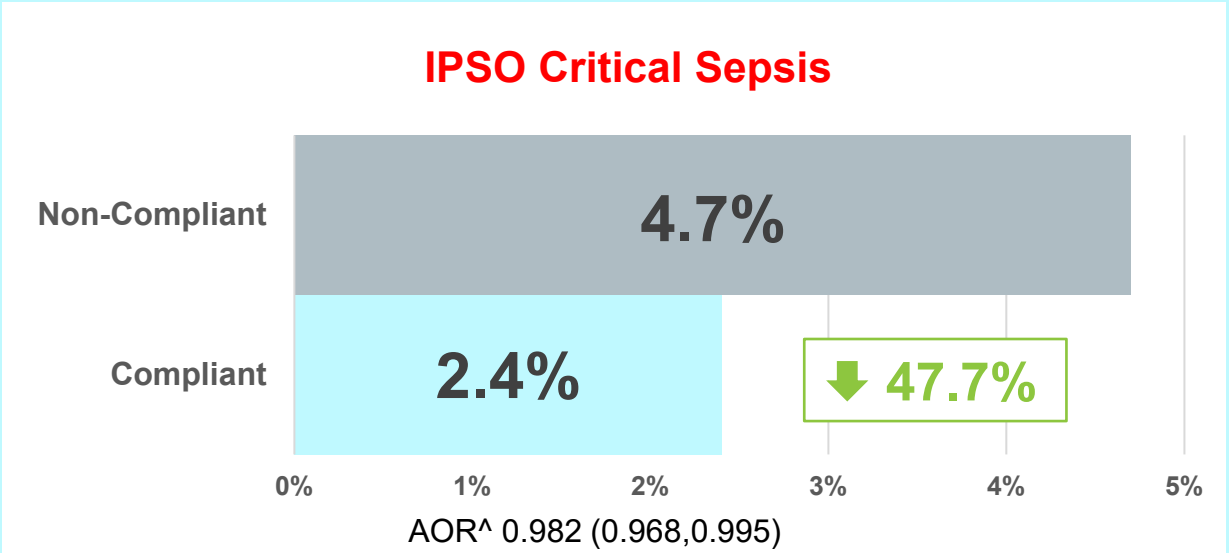
AND

Sepsis Treatment

Administration of:

- bolus in ***60*** minutes
- AND
- antibiotic in ***180*** minutes

Association Between Bundle Compliance and 30-Day Sepsis-Attributable Mortality



^ Adjusted Odds Ratio (95% CI) adjusted for age at functional time zero (FTZ), high risk conditions, positive blood culture, lactic acid > 4 mmoll/L, time to surgical source control, FTZ care setting, and clustering of episodes within hospital

(Paul et al, 2023)

Recognition

Screen, Huddle, Order Set

Sepsis Recognition

- Utilization of sepsis recognition processes is associated with lower sepsis-attributable mortality, fewer hospital days and ICU days and reduced disparities in sepsis recognition.
- Screening tool, huddle and orderset work together!

Sepsis Screen

Sepsis Screen

IPSO recommendation: Implement a screening tool adapted for a specific care setting

- **Implementation Guidance**
  - Start with paper to test
  - Consider a 2-tiered system
  - Follow positive screens with a bedside huddle
- **Strategies for common barriers**
  - Test in the background
  - Share PPV vs Sensitivity on an ongoing basis

Sepsis Huddle

Sepsis Huddle

IPSO recommendation: When potential sepsis is identified, or if there is concern about continued deterioration from sepsis at any point, conduct a huddle to review the clinical findings, determine if sepsis is evolving, and plan next steps in care.

- **Implementation Guidance**
  - Keep the huddle brief and focused
  - Include a structured assessment and plan
- **Strategies for common barriers**
  - Build on other successful local processes (eg rapid response teams)
  - Communicate wins often

Sepsis Order Set

Sepsis Order Set

IPSO recommendation:

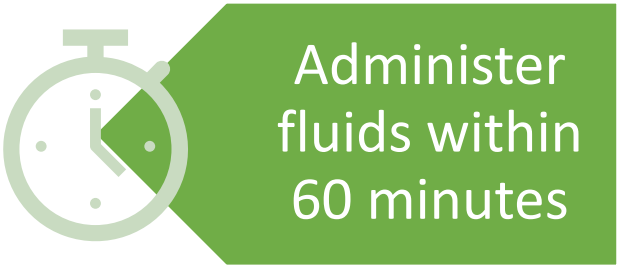
- Use an evidence-based guideline to standardize evaluation and treatment orders for patients with suspected sepsis
- Ensure the order set is built to support rapid workup and treatment (e.g., “STAT” for labs and antibiotics)
- Include culture, 1st bolus and STAT antibiotics

- **Implementation Guidance**
  - Assure alignment between ordersets and clinical pathways
  - Utilize pre-clicks
- **Strategies for common barriers**
  - Include trainees in development as they use the order set most frequently

Treatment

Fluid Bolus & Antibiotic Timeliness

Fluid Bolus Timeliness



- **IPSO recommendation:** Administer up to 40-60 ml/kg in bolus fluid within 60 minutes
- Implementation strategies:
  - Ensure enough fluids are stocked in each unit
  - Develop sepsis pathways and order sets that promote best practices:
    - e.g., Appropriate fluid choices (balanced, lactated ringers vs. 0.9% saline)
  - Accurately document IV fluid start times (e.g., EHR, laminated tool, sepsis checklist)

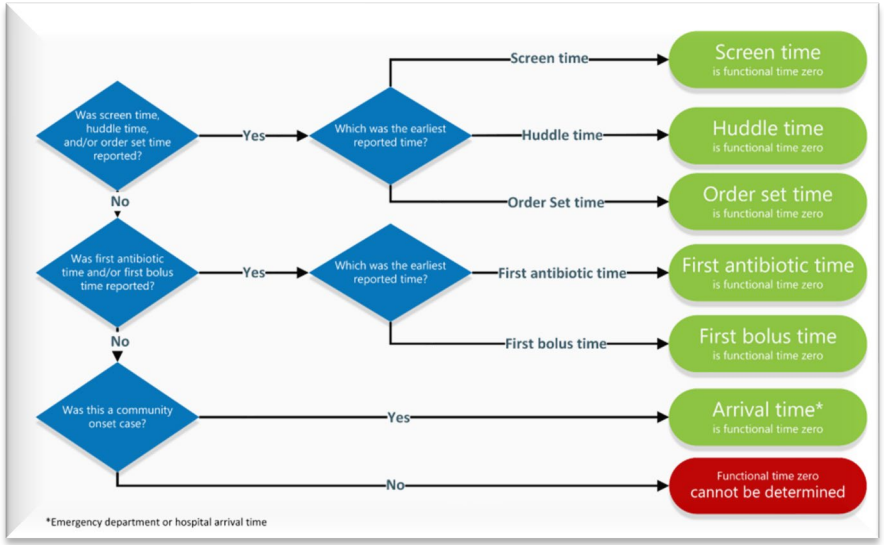
Antibiotic Timeliness

- **IPSO recommendation:** Initiate timely empiric antibiotics within 1 hour for septic shock and within 3 hours for sepsis without shock
- Implementation strategies:
  - Include pharmacy staff in developing antibiotic workflows
  - Develop sepsis pathways and order sets that promote best practices
    - e.g. Empiric antibiotic choices that considers sites of infection, high-risk/ immunocompromised patients
  - Accurately document IV antibiotic start times (e.g., EHR, laminated tool, sepsis checklist)

Measurement

Measurement

- **Defining sepsis for QI**
  - **Balance of automatability, validity and ability to drive QI**
  - **IPSO Sepsis and IPSO Critical Sepsis (intention-to-treat)**
- **Choosing key performance metrics**
  - **Processes – focus on bundle interventions**
  - **Outcomes – mortality and epidemiology**
- **Approximating sepsis onset**
  - **Automated via EHR surrogates**
  - **Earliest "recognition" → earliest fluids/abx → arrival**
- **Tracking and benchmarking**
  - **Standardized dashboard examples**
  - **Sepsis data tracking via PHIS**



Measurement

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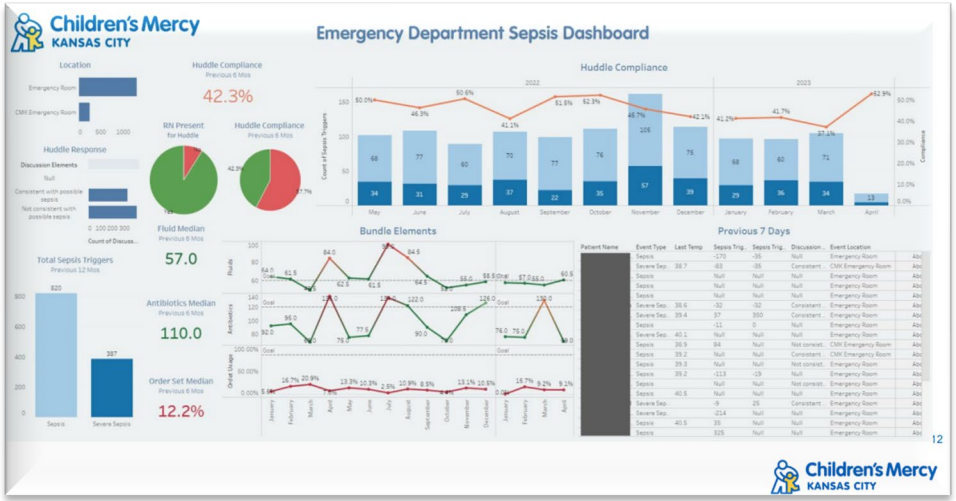


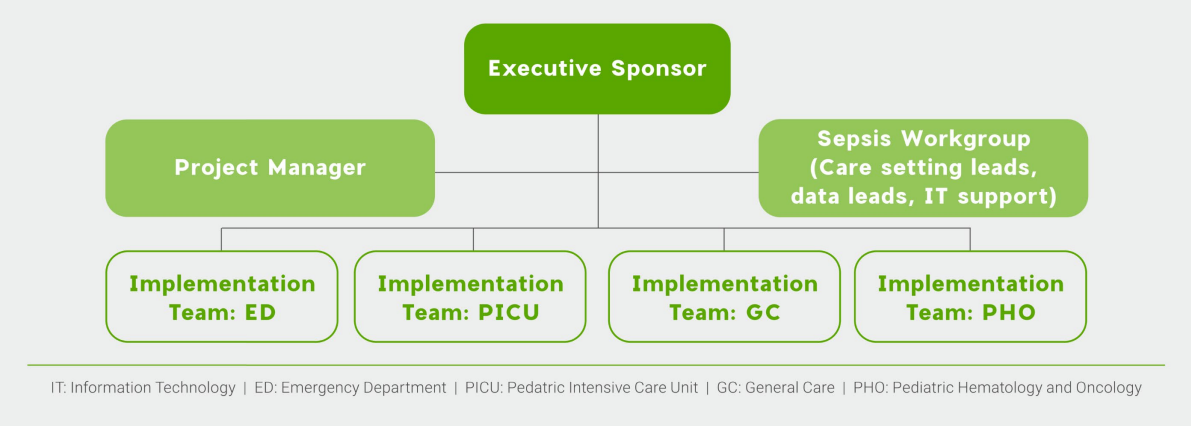
Pediatric Sepsis Program Development

Developing a Pediatric Sepsis Program

- Where to start
- Initial actions for launching a sepsis program
  - Identify the sepsis program leader or co-leaders
  - Secure support from hospital leadership
  - Conduct a needs analysis to identify areas for improvement
  - Establish initial goals for the sepsis program

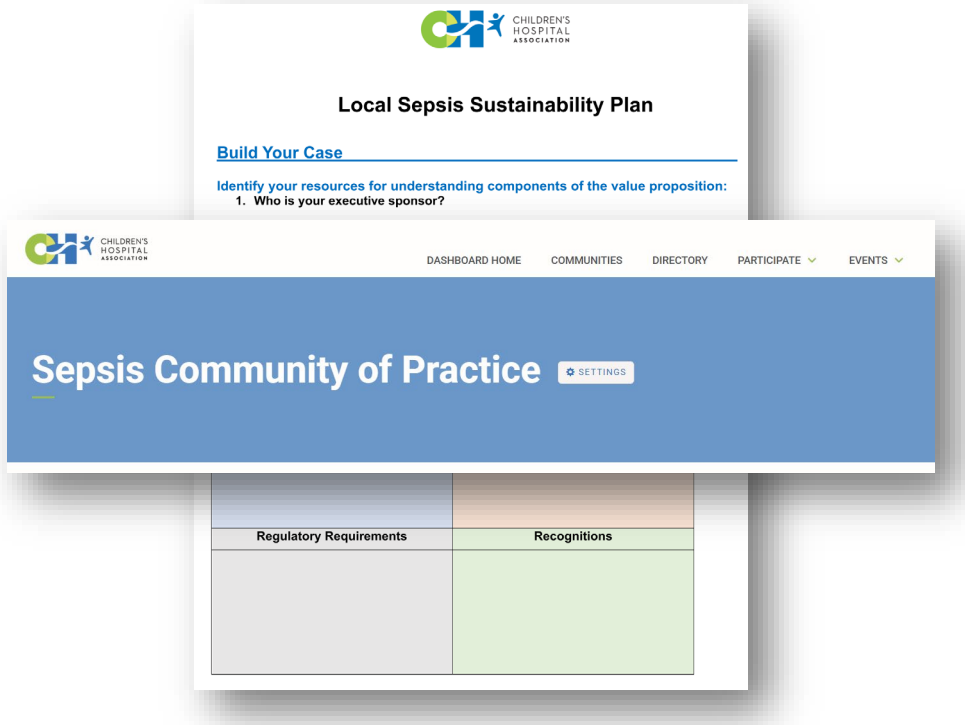
Developing a Pediatric Sepsis Program

- Leadership commitment and accountability
- Allocate necessary resources for the program
- Plan for sepsis education
- Team Structure:
  - Multidisciplinary, lean but inclusive
  - Appoint a dedicated sepsis coordinator



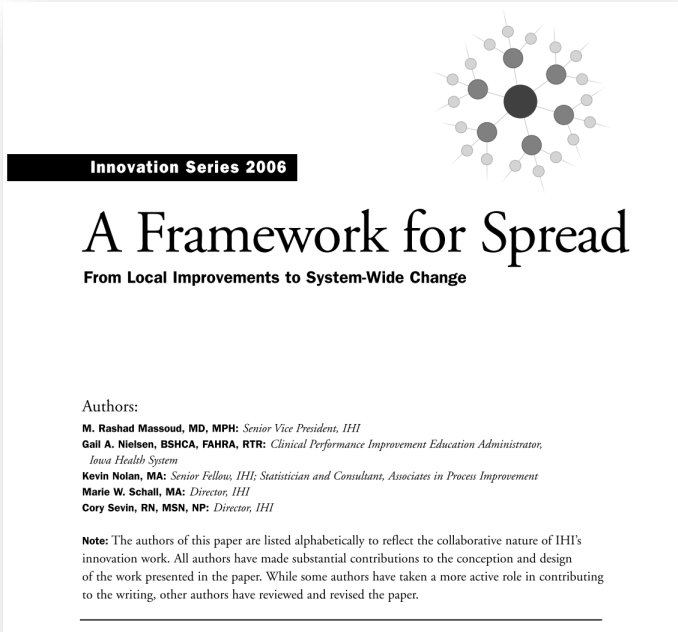
Developing a Pediatric Sepsis Program

- Focus on Sustainability:
  - Consider sustainability from the outset of program development
  - Align sepsis with organizational priorities
  - Create enduring processes for front-line staff
  - Develop a plan for ensuring new knowledge is properly evaluated and incorporated
  - Foster external partnerships: CHA's Pediatric Sepsis Community of Practice



Developing a Pediatric Sepsis Program

- Spreading Your Improvement Work:
  - Consider additional hospital care areas, system-wide practice, and community hospitals
  - Can drive towards health equity, accelerate progress in care improvements, and enhance collaboration
  - Think about spread once outcomes and sustainability can be reliably demonstrated
  - Use IHI Framework for Spread and Healthcare Improvement Scotland guidelines



Innovation Series 2006

A Framework for Spread

From Local Improvements to System-Wide Change

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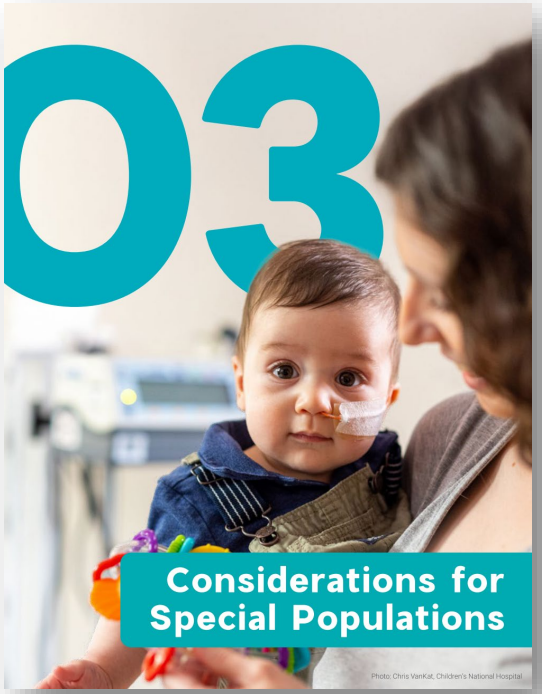
Note: The authors of this paper are listed alphabetically to reflect the collaborative nature of IHI's innovation work. All authors have made substantial contributions to the conception and design of the work presented in the paper. While some authors have taken a more active role in contributing to the writing, other authors have reviewed and revised the paper.

Special Populations within Pediatric Sepsis

Special Populations within Pediatric Sepsis

- Hematology/Oncology
- Critical Care
- Caring for Children in Systems Serving Adult and Pediatric Populations
- Transport
- Additional Special Populations



Special Populations

- Caring for Children in Systems Serving Adult and Pediatric Populations
  - Leverage partnerships with adult sepsis teams
  - Adapt adult-focused protocols for children
  - Align pediatric sepsis improvement work with established adult SEP-1 reporting systems
  - Establish process for training front-line staff on pediatric-specific protocols
  - Ensure appropriately sized pediatric equipment is available

Tool Library

Tool Library

Resource Library

The following tools were developed by Children's Hospital Association and participants of the Improving Pediatric Sepsis Outcomes collaborative and have been shared for use and adaptation for local sepsis improvement work. Please use the suggested citation in presentations or publications. Latest revision dates are noted where available.

Bundle Implementation

- Recognition
  - Screen
  - Huddle
  - Order Set
- Antibiotic
- Bolus
- IV Access
- Checklists
- Pathways

Education

- Staff Education
- Patient/Family Education

Measurement

- Dashboard
- Time Zero Cheat Sheet

Program Development

- Team Structure
- Readiness Inventory
- Sustainability
- Spread

Special Populations

- High-Risk Conditions

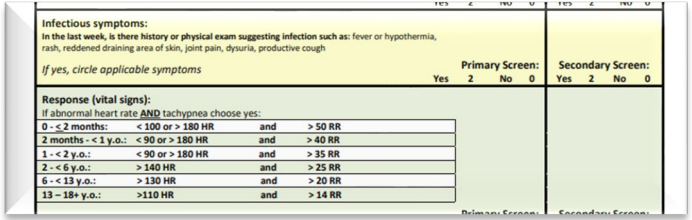
Bundle implementation

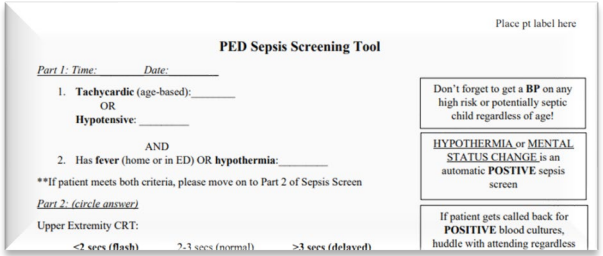
Recognition

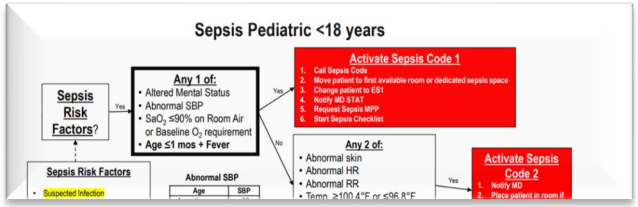
Screen

- Screen EHR Tool (ED, Danville Geisinger Janet Weis Children's Hospital)
- Screen EHR Tool (ED, Fort Worth Cook Children's Medical Center)
- Screen EHR Tool (PICU, Houston Children's Memorial Hermann Hospital)
- Screen Improvement Initiative (ED, Children's Hospital of Atlanta (CHOA))
- Screen Paper Tool (Fort Worth Cook Children's Medical Center)
- Screen Paper Tool (ED, Baltimore University of Maryland Children's Hospital)
- Screen Paper Tool (ED, Houston Children's Memorial Hermann Hospital)
- Screen Paper Tool (ED, Tacoma Mary Bridge Children's Hospital)
- Screen Paper Tool (GC, Baltimore University of Maryland Children's Hospital)
- Screen Paper Tool (GC, Houston Children's Memorial Hermann Hospital)
- Screen Paper Tool (PICU, Akron Children's Hospital)

Huddle







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IPSO Official Publications

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Questions?

Thank You!

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