IMPROVING PEDIATRIC SEPSIS OUTCOMES

A multi-year collaborative for children’s hospitals to reduce sepsis mortality and morbidity across all levels of care.
EXECUTIVE SUMMARY

Time to Take Action
Join the sepsis initiative exclusively for children’s hospitals that will save thousands of lives and hundreds of millions of dollars in costs every year. Our opportunity for impact is enormous because the sepsis problem is enormous.

Sepsis is the leading cause of death in hospitalized children, killing almost 7,000 children annually in the U.S., more than cancer. Sepsis is expensive; costs to treat severe sepsis range from $65,000 to $85,000. It accounts for 16% of all pediatric health care spending—around $5 billion. As many as 75,000 children are hospitalized annually for sepsis and 65 percent of those children are treated in children’s hospitals.

Children’s Hospitals Respond
Whether your organization is getting started in the fight against sepsis, or has an in-house sepsis program in place, the Improving Pediatric Sepsis Outcomes (IPSO) collaborative will accelerate your progress to improved outcomes. Children’s hospitals large and small are benefiting and contributing.

Participating hospitals have access to bundles addressing diagnosis and treatment, the experience of children’s hospitals working at the leading edge to improve sepsis outcomes, and the largest pool of clinical pediatric sepsis data available.

Results You Can Expect
Aggregate data from collaborative hospitals demonstrate that IPSO strategies are working:
- 19% decrease in sepsis-related mortality.
- 6% decrease in hospital days per sepsis episode.
- 30% increase in sepsis patients being recognized.
- 7% decrease in time to first fluid bolus.
- 30% increase in the use of sepsis recognition and diagnostic bundles.
- 10% decrease in time to first IV antibiotic.

Commitment
Submit a letter of commitment to enroll in IPSO. Executive engagement and sponsorship are critical to achieving hospital-wide results. To achieve IPSO’s ambitious aims, plan to participate for three years and work across the hospital, rather than within one or two units.

Participation Criteria
The collaborative is open to any hospital that is a member of Children’s Hospital Association (CHA).

For enrollment details, contact:
Patty Kohn | patty.kohn@childrenshospitals.org | 913-981-4187

Nearly 7,000 children die from sepsis each year

75% of septic patients are admitted to an ICU for intensive care after a sepsis diagnosis

50% of sepsis survivors are readmitted for additional care after the first episode

38% of sepsis cases result in moderate to severe disability or death

The average cost of a hospitalization for treating severe sepsis ranges from $65,000-$80,000

Sepsis treatment accounts for 16% of all costs for pediatric hospitalizations
WHAT IS IPSO?

It’s the most ambitious initiative by children’s hospitals to combat this deadly condition. Clinicians across the health care continuum are broadening awareness and making a difference.

The IPSO collaborative builds on a substantial body of research, guidelines, national campaigns, collaboratives and local implementation efforts. More than 60 pediatric sepsis experts from more than 40 hospitals contributed the best evidence and practices to create an initiative that is innovative in scope and methods.

- In addition to improving diagnosis and treatment of severe sepsis, IPSO is breaking new ground by targeting the prevention of hospital-onset severe sepsis in any hospital setting. Preventing escalation to severe sepsis is key to preventing associated avoidable long-term health consequences, as well as reducing sepsis mortality rates.

- Integrating what has worked in specific subspecialties or settings, IPSO’s interventions cross subspecialty and care setting boundaries, from the Emergency Department (ED), to any inpatient unit, and ultimately to pre-hospital and ambulatory settings. To adapt to specific needs the core interventions are extended with components appropriate for the patient population, such as cancer patients.

<table>
<thead>
<tr>
<th>PHASE ONE</th>
<th>PHASE TWO</th>
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<tbody>
<tr>
<td>ED</td>
<td>Pre-hospital units</td>
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<td>PICU</td>
<td>System and community EDs</td>
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<td>Hematology/Oncology</td>
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<td>Bone marrow transplant units</td>
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<td>General care units</td>
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- IPSO engages the front-line of patient care, hospital leaders, family advisors, pharmacy, labs and infection prevention to establish the coordinated and reliable care essential for timely diagnosis and treatment.

- Using a proven model distinguished by all-teach-all-learn collaboration combined with rigorous methodologies, standardized bundles, and rich data sets of process and outcome metrics, participating hospitals achieve improvements at lower cost, more efficiently, and faster than any single hospital can achieve working independently.

What IPSO participants are saying

“Sharing local performance data helped persuade leadership to promote sepsis as a priority across the entire institution.”

“One nurse used to spend 20 hours a week reviewing sepsis charts in the ED alone. Now our IPSO data pulls our sepsis patient information in less than 30 minutes.”

“We recently cared for a child who was screened, treated and discharged in three days. A year before, that same child would have been intubated and in the ICU for three weeks.”

“We are identifying sepsis patients one to eight hours sooner with our IPSO screening and trigger processes.”
BENEFITS OF PARTICIPATION

Working closely with peers to drive improvement can change outcomes for all pediatric patients with sepsis. Through this collaborative, your hospital can access the expertise of more than 2,000 people working on IPSO teams and can learn about and test effective ways to:

- Improve patient outcomes and patient experience of care
- Improve faster and at a lower cost than working independently
- Solve small sample size/rare event problems
- Implement what works and reduce trial and error
- Reduce costs by sharing infrastructure; avoid design and development costs
- Earn continuing education credit for nurses and physicians, and maintenance of certification credit for physicians.
- Expand staff QI know-how and experience
- Access to three Pediatric Learning Solutions online sepsis modules

ACTIVITIES, SERVICES AND MEASURES

IPSO Activities
This collaborative is comprehensive, providing your team with multiple opportunities to improve surveillance, diagnosis and treatment.

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<thead>
<tr>
<th>MOBILIZE</th>
<th>MEASURE</th>
<th>IMPLEMENT</th>
<th>COLLABORATE</th>
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<tbody>
<tr>
<td>Build hospital-wide partnership</td>
<td>Identify data sources</td>
<td>Implement</td>
<td>Peer-to-peer sharing</td>
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<tr>
<td>Engage family advisors</td>
<td>Identify cases</td>
<td>• Sepsis screen</td>
<td>• Weekly office hours</td>
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<td>Develop structure</td>
<td>Measure 5 key processes</td>
<td>• Sepsis huddle</td>
<td>• Anytime discussion board</td>
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<td>Assess resources and readiness</td>
<td>• Sepsis order set</td>
<td>• Sepsis screen</td>
<td>• Hot topic webinars</td>
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<tr>
<td>Map processes and changes</td>
<td>• Time to first bolus</td>
<td>• Sepsis huddle</td>
<td>• Data strategy webinars</td>
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<tr>
<td>Plan implementation</td>
<td>• Time to IV antibiotic</td>
<td>• Sepsis order set</td>
<td>• Sepsis education webinars</td>
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<tr>
<td>Train teams</td>
<td>Clean, validate, submit data monthly</td>
<td>Address timeliness of</td>
<td>• EMR techniques</td>
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<td>Roll out to units and services</td>
<td>Review monthly reports</td>
<td>• Antibiotics</td>
<td>Semiannual workshops</td>
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<td>• Fluid resuscitation</td>
<td>Web-based library</td>
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<td>Identify and analyze gaps in performance on 5 key processes</td>
<td>• Training modules</td>
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<td>Rapid-cycle performance improvement</td>
<td>• Intervention bundles</td>
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<td>• Data specifications</td>
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<td>• Ideas</td>
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<td>• Tools and resources</td>
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<td>Direct coaching</td>
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<td>Help desk</td>
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**IPSO Services**
When your hospital invests in the IPSO collaborative, you gain access to a large number of resources that will support your efforts.

- Leadership from national experts
- IPSO diagnosis and treatment bundles are well aligned with the 2020 Surviving Sepsis Campaign pediatric guidelines
- Measures for outcomes and processes
- Flexible data submission via EMR export, local data collection form systems or web data entry
- Secure web portal for aggregate and custom reports
- Monthly data analysis
- Custom performance reports
- Monthly aggregate benchmarking
- Webinars
- Workshops
- Bundle training materials
- QI methodology training
- Repository of tools and resources, including trigger tools, evidence tables and bibliography
- Access to collaborative data assets for analysis, research and publication
- Online discussion group

**Aims and Measures**
The IPSO collaborative aims to reduce sepsis mortality and reduce hospital-onset severe sepsis. This effort will help you plan and implement process changes that ensure the best outcomes when dealing with sepsis in your hospital.

<table>
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<tr>
<th><strong>KEY DRIVERS OF IPSO WORK</strong></th>
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<tr>
<td><strong>Reduce hospital-onset sepsis by 25%</strong></td>
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<td><strong>Reduce sepsis-attributable mortality by 25%</strong></td>
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<tr>
<td><strong>Prevention</strong></td>
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<td><strong>Recognition</strong></td>
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<td><strong>Diagnosis</strong></td>
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<td><strong>Rescuscitate</strong></td>
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<td><strong>De-escalate</strong></td>
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**IPSO Outcome Measures**
- Sepsis-attributable mortality in IPSO Sepsis (3- and 30-day)
- Sepsis-attributable mortality in IPSO Critical Sepsis (30-day)
- Incidence of hospital-onset IPSO Critical Sepsis
- Incidence of IPSO Critical Sepsis
- Organ Dysfunction (3- and 30-day)
- Days free of ICU, vent, vasoactive drugs

**IPSO Process Measures**
- Sepsis screen and huddle activations (%)
- Sepsis order set utilization (%)
- Time to first IV antibiotic; first and third bolus; pressor; order set initiation; time to surgical source control
FEES
Enrolled hospitals pay a fee based on number of staffed beds (including NICU) and have access to all program resources to support the work. Implementation is supported by member hospital dues, and by participation fees that are tiered based on hospital size, ranging from $10,000 to $45,000.

COLLABORATIVE LEADERSHIP
Experts from children’s hospitals worked closely with CHA to carefully evaluate and develop all aspects of the sepsis collaborative.

Co-Chairs
Richard Brilli, M.D., FAAP, MCCM* | Nationwide Children’s Hospital
Charles Macias, M.D., M.P.H.* | UH Rainbow Babies & Children’s Hospital
Matthew Niedner, M.D.* | Unaffiliated
Raina Paul, M.D.* | Advocate Children’s Hospital

National Expert Advisory Committee
More than 60 individuals have been working to initially design and continually improve the collaborative.

Arkansas Children’s Hospital
Jared Capouya, M.D. | General Care

Arnold Palmer Hospital for Children
Jill Dykstra-Nykanen, RN* | Quality Department

Boston Children’s Hospital
Leslie Lehmann, M.D. | Hematology/Oncology
Greg Priebe, M.D.* | Intensive Care Units

Children’s Healthcare of Atlanta
Jim Fortenberry, M.D. | Intensive Care Units

Children’s Hospital Colorado
Halden Scott, M.D.* | Emergency Department
Beth Wathen, RN* | Intensive Care Units

Children’s Hospital of Philadelphia
Fran Balamuth, M.D.* | Emergency Department
Julie Fitzgerald, M.D.* | Intensive Care Units

Children’s Mercy Kansas City
Leslie Hueschen, M.D.* | Emergency Department

Children’s National Hospital
Kathy Brown, M.D. | Emergency Department

Children’s Wisconsin
Wendi Redfern, RN | Intensive Care Units

Cincinnati Children’s Hospital Medical Center
Holly Depinet, M.D.* | Emergency Department
Erika Stalets, M.D.* | Intensive Care Units

Cohen Children’s Medical Center
Joel Brochstein, M.D. | Hematology/Oncology
Pete Silver, M.D.* | Intensive Care Units

Cook Children’s Medical Center
Rhiannon McDonnell, RN | Hematology/Oncology

Dell Children’s Medical Center of Central Texas
Dory Collette, RN | General Care
Mark Shen, M.D. | General Care
Toni Wakefield, M.D. | General Care

Impact of Sepsis
Preventing one case of severe sepsis saves $65,000-$85,000
Preventing six cases of severe sepsis protects a child from a moderate disability
Preventing 10 cases of severe sepsis saves a child’s life
Golisano Children’s Hospital at the University of Rochester Medical Center
Julie Gottfried, RN | General Care
Elise Van der Jagt, M.D. | General Care

Hassenfeld Children’s Hospital at NYU Langone
Amanda Carr, RN | NICU
Annie Yang, Pharm.D. | Pharmacy
Juliette Schluter | Patient and Family Engagement

Helen DeVos Children’s Hospital
Ed Beaumont, M.D. | Neonatal Intensive Care Units
Beth Huizinga, RN | Neonatal Intensive Care Units
Lynn Stachel, RN | Hematology/Oncology

Johns Hopkins All Children’s Hospital
Elliot Melendez, M.D. | Intensive Care Units

Johns Hopkins Children’s Center
Allen Chen, M.D. | Hematology/Oncology
Chris Gamper, M.D. | Hematology/Oncology

Kentucky Hospital Association
Deb Campbell, RN* | Intensive Care Units

Lucile Packard Children’s Hospital Stanford
Cassandra Bergero, RN | General Care

Mayo Clinic Children’s Center
Charlie Huskins, M.D.* | Infectious Disease

Me Fine Foundation
Lori Lee | Patient and Family Engagement

Mercy Children’s Hospital - St. Louis
Li Ern Chen, M.D. | Surgeon

Monroe Carell Jr. Children’s Hospital at Vanderbilt
Amy Potts, M.D. | Pharmacy
Tanya Boswell, RN | Infection Prevention

Mt. Washington Pediatric Hospital, Inc.
Erica Jones, RN | Infection Prevention

MUSC Shawn Jenkins Children’s Hospital
Elizabeth Mack, M.D.* | Intensive Care Units

Nationwide Children’s Hospital
Jeff Auletta, M.D.* | Hematology/Oncology
Brian Kenney, M.D. | Surgeon

North Carolina Children’s Hospital
Leah Hatfield, Pharm.D. | Pharmacy
Phillip Roehrs, M.D. | Hematology/Oncology

Phoenix Children’s Hospital
Toni Gross, M.D. | Pre-hospital

Primary Children’s Hospital
Roni Lane, M.D. | Emergency Department
Gitte Larsen, M.D.* | Intensive Care Units

Riley Hospital for Children at Indiana University Health
Kelly Tran, RN | Hematology/Oncology
Tina Schade Willis, M.D. | Intensive Care Units

Seattle Children’s
Adam Goldin, M.D. | Surgeon
Lori Rutman, M.D.* | Intensive Care Units

St. Jude Children’s Research Hospital
Aditya Gaur, M.D. | Infectious Disease

Texas Children’s Hospital
Yahaira Colorado, RN | Emergency Department
Eric Williams, M.D. | Intensive Care Units
Liz Wuestner, RN | Emergency Department

UCLA Mattel Children’s Hospital
Kerry Gold-Tsakonas, RN | Emergency Department
Theresa Kirkpatrick, RN | Intensive Care Units

UH Rainbow Babies & Children’s Hospital
Kristin Hackeman, RN | Emergency Department
Hellene Speicher, Pharm.D. | Pharmacy

UPMC Childrens’ Hospital of Pittsburgh
Joe Carcillo, M.D. | Intensive Care Units

Upstate Golisano Children’s Hospital
Melissa Schafer, M.D.* | General Care

Valley Children’s Healthcare
Faisal Razzaqi, M.D.* | Hematology/Oncology

Yale New Haven Children’s Hospital
Sarah Kandil, M.D.* | Hematology/Oncology

*IPSO Leadership Group member