



Janet Weis
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Project Management

IPSO FITI Webinar Series
October 14, 2021 | 3PM EST



Geisinger Medical Center Danville, PA

IPSO Webinar Series

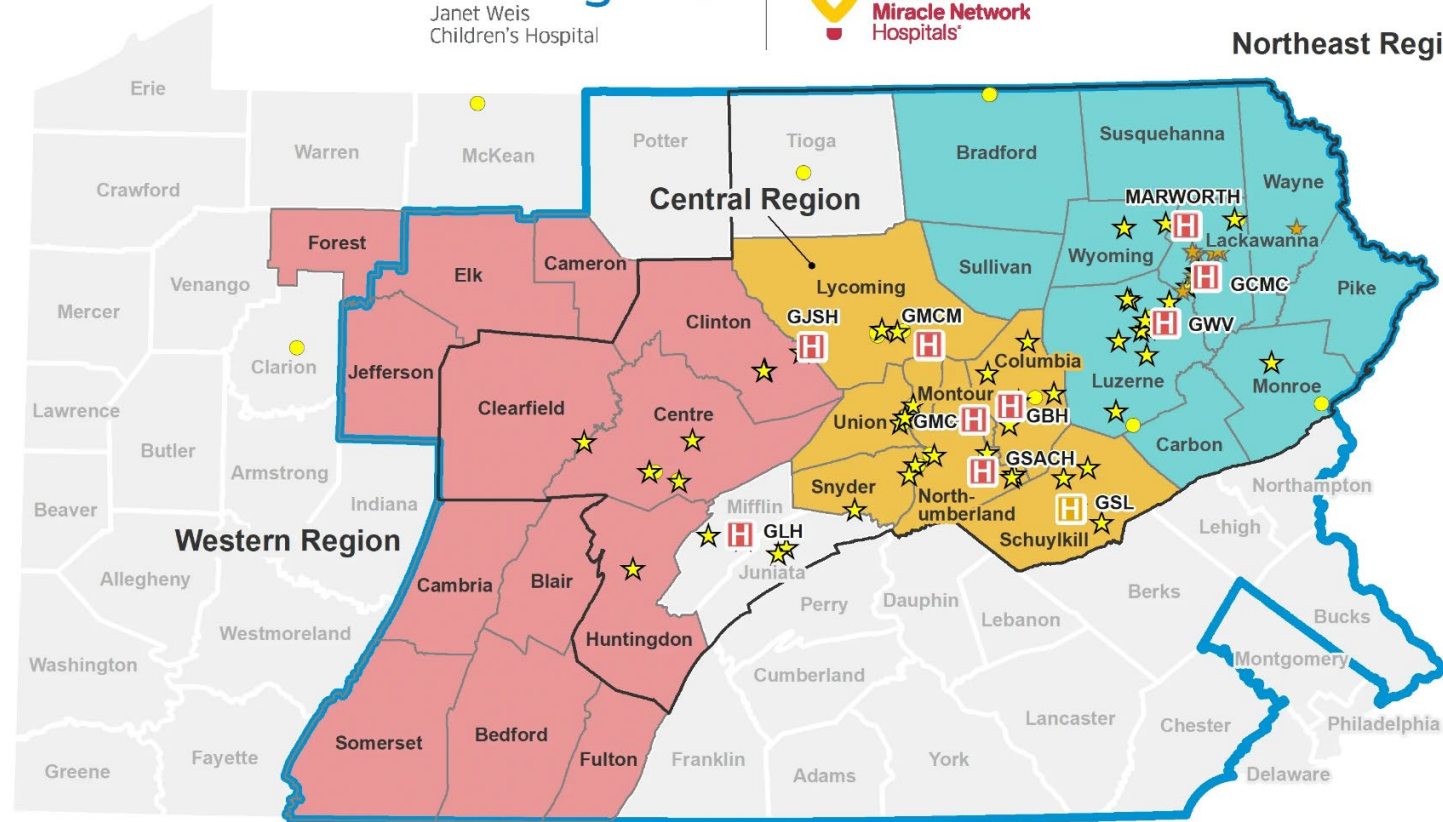
From Ideas To Implementation

JWCH efforts started with Pediatric ED Care

- **Introduction to Geisinger JWCH and Team**
- **Key Highlights**
 - **Order Set development and implementation**
 - **Resident engagement**
 - **Analytics and data sharing using a Tableau Dashboard**
- **Successes & challenges for pediatric care in integrated health system**
- **Q&A**

Geisinger

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- CMN Western Region
- CMN Central Region
- CMN Northeast Region
- Geisinger service area
- GHP service area
- PA county

Geisinger facilities

- Inpatient facility
- Affiliated hospital
- Primary care clinic
- Affiliated primary care clinic
- Specialty clinic



GBH – Geisinger Bloomsburg Hospital
 GCMC – Geisinger Community Medical Center
 GJSH – Geisinger Jersey Shore Hospital
 GLH – Geisinger Lewistown Hospital
 GMC – Geisinger Medical Center
 GSACH – Geisinger Shamokin Area Community Hospital
 GSL – Geisinger St. Luke's
 GWV – Geisinger Wyoming Valley Medical Center
 Marworth – Geisinger Marworth Treatment Center
 GMCM – Geisinger Medical Center Muncy **Opening fall 2021**

Geisinger

Integrated Health System

Serves >1 million people

550,000-member health plan

2 research centers

Geisinger Commonwealth School of Medicine

9 Hospitals + EDs

Suburban/Primarily Rural Settings

JWCH

Danville GMC Campus

Main Children's Hospital

91 pediatric beds (36 Med/Surg, 14 PICU, 41 NICU)

Peds ED Zone

Wilkes-Barre GWV Campus

21 pediatric beds (7 Med/Surg, 14 NICU)

Peds ED Zone

Scranton GCMC Campus

Up to 10 low-acuity pediatric med/surg beds



- ✓ "Pandemic ready" with negative-pressure rooms
- ✓ Separate from adult care
- ✓ Child and family friendly and safe

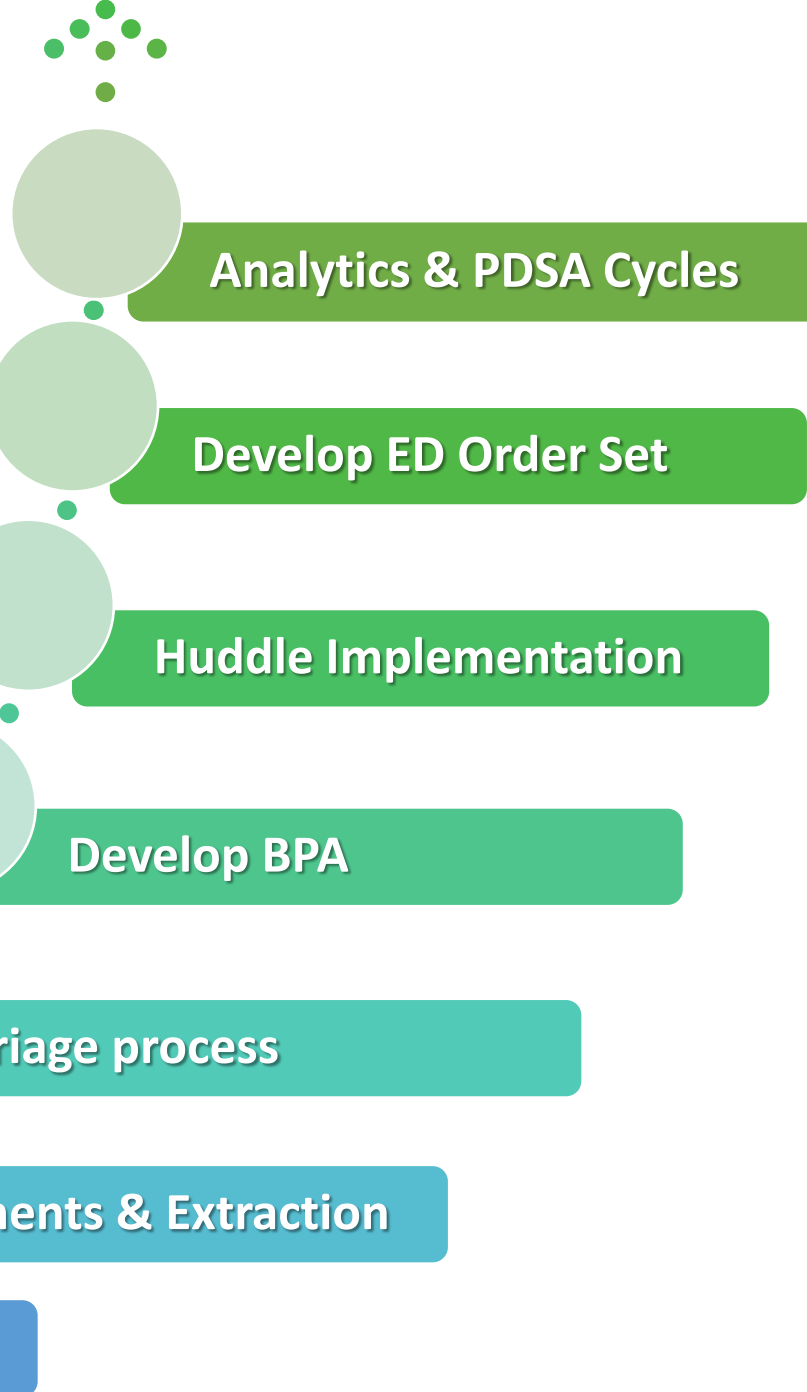


Pediatric Emergency Medicine



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*Improving
Pediatric
Sepsis
Outcomes*



**our
team...**

Emergency Medicine (EM)

2 PEM Physicians
ED Nursing Team
EM Pharmacy

Peds Infectious Diseases

Peds Quality & Safety
Peds & EM Pharmacy

System Quality
Project Management

Analytics
Informatics

Trainees

EM Residents
Peds and Med-Peds Residents
Informatics Fellows



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Improving Pediatric Sepsis Outcomes

Analytics & PDSA Cycles

Develop ED Order Set

Huddle Implementation





Develop BPA

Triage process

Data Elements & Extraction

Joined IPSO July 2019

our approach...

-  **Start with focused efforts in ED Setting**
-  **Identify children with sepsis and at risk for sepsis**
-  **Optimize care during sepsis evaluations and management**
-  **Organize data collection and sharing**

Pediatric Sepsis Dashboard - ED [Link](#)

Analytics

- Sepsis Episodes triggered by BPA
- Suspected Sepsis and Severe Sepsis
- Key Process Measures
- Sepsis Patient Log

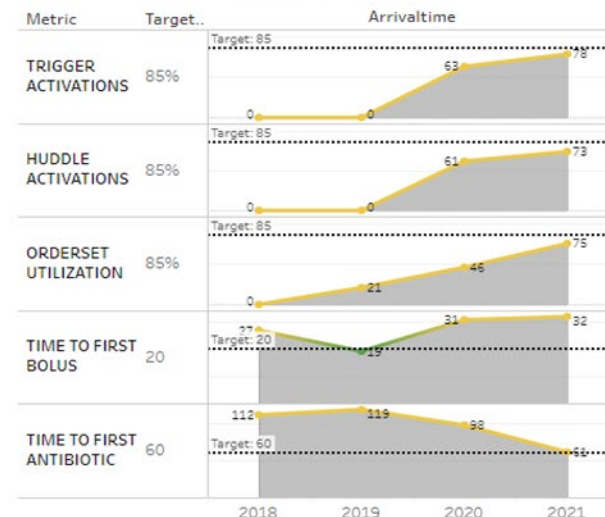
Note: Sepsis is defined per the IPSO definitions

Pediatric Sepsis Dashboard

Data Filters
Hospital: (All) ED Encounter: YES Year: (All)

5 Key Process Measures

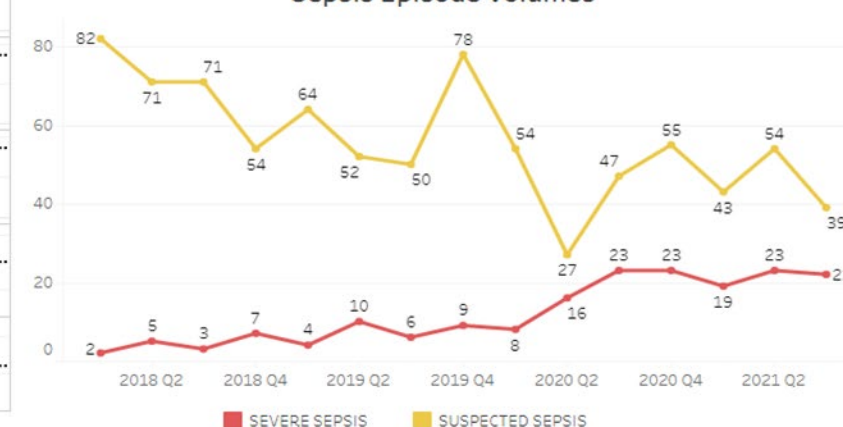
Hover for Hospital Values



Sepsis Definitions:

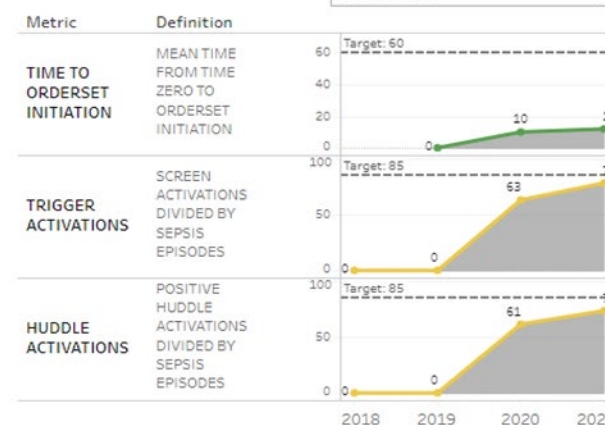
<https://www.childrenshospitals.org/-/media/Files/Groups/IPSO/06212019-Reviewed-Technical-Documents/IPSO-Sepsis-Patient-Identification-Guide.pdf?la=en&hash=518A905F8A9A993F5722BCF71AF7BF51D6CE1304>

Sepsis Episode Volumes



Bundle Metrics

Bundle Name: RECOGNITION



Sepsis Category

SEVERE SEPSIS

Sepsis Log

Arrivaltime	Hospital	Pat Mrn Id	Positive Screen Treatment	Positive Huddle	ICU Admission + Treatment	Lactate Drawn Treatment	Order Treati
9/9/2021 6	GWV		0	1	0	0	1
9/9/2021 2	GMC		0	1	0	0	1
9/7/2021 1	GMC		0	1	0	0	1
8/25/2021	GWV		0	1	0	0	0
8/23/2021	GWV		0	1	0	0	1
8/23/2021	GMC		0	1	0	0	1
8/23/2021	GMC		0	1	0	0	1
8/20/2021	GMC		0	1	0	0	1
8/12/2021	GMC		0	0	0	0	1
8/8/2021 3	GMC		0	1	0	0	1
8/6/2021 5	GWV		0	0	0	0	1
8/4/2021 4	GMC		0	1	0	0	1
8/3/2021 2	GWV		0	1	0	0	1

Pediatric Sepsis

Best Practice Alerts (BPA) in EHR

- ✓ **ED Nursing Flow and Triage**
2-Step Best Practice Alert → ED/Triage
- ✓ **Huddle BPA/Documentation**
Multidisciplinary team, Nursing Documentation
- ✓ **Provider Workflow**
BPA for Order Set and Use of Order Set

Based on published data from CHOP and work around Best Practice Alert use for pediatric sepsis

Nursing/Triage Workflow → Initial Vital Signs Trigger

BPA #1 triggered by Abnormal Vital Sign(s) for Age

↑ Heart rate OR ↓ BP

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1)

COMPLETE A SEPSIS SCREEN

BP: (!) 60/30
Pulse: (!) 150

Click "Document" if patient has (at home or ED):

- fever ($\geq 38^{\circ}\text{C}$)
- hypothermia ($\leq 35^{\circ}\text{C}$)
- signs of infection

Acknowledge Reason

If no to any of the 3 questions
then click "do not document"
and note "Acknowledge Reason"

Nursing/Triage Workflow → Yes to Vitals BPA (#1) → Sepsis Screen BPA

BPA #1 Trigger = Abnormal Vital Sign(s) for Age

↑ Heart rate OR ↓ BP

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1)

!! COMPLETE A SEPSIS SCREEN

BP: (!) 60/30
Pulse: (!) 150

Click "Document" if patient has (at home or ED):

- fever ($\geq 38^{\circ}\text{C}$)
- hypothermia ($\leq 35^{\circ}\text{C}$)
- signs of infection

Document **Do Not Document** Flowsheets

Acknowledge Reason

Pt does NOT have fever, hypothermia or i... Patient unstable, I will document later

If no to any of the 3 questions
then click "do not document"
and note "Acknowledge Reason"

If yes to any of the 3 questions
then click "document" and
answer additional questions

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1)

!! COMPLETE A SEPSIS SCREEN

BP: (!) 60/30
Pulse: (!) 150

Click "Document" if patient has (at home or ED):

- fever ($\geq 38^{\circ}\text{C}$)
- hypothermia ($\leq 35^{\circ}\text{C}$)
- signs of infection

Document **Do Not Document** Flowsheets Collapse

Sepsis Screen

Central capillary refill

1-2 seconds 3 seconds 4 seconds 5 seconds or above

High risk sepsis criteria

<input type="checkbox"/> None	<input type="checkbox"/> Asplenia
<input type="checkbox"/> Bone marrow or solid organ transplant	<input type="checkbox"/> Central line
<input type="checkbox"/> Malignancy	<input type="checkbox"/> Significant CNS/functional technology depe...
<input type="checkbox"/> Other immunodeficiency / immunocompromise	<input type="checkbox"/> Sickle Cell Disease
<input type="checkbox"/> Age less than 60 days	

Level of consciousness

<input type="checkbox"/> Normal	<input type="checkbox"/> Crying, inconsolable	<input type="checkbox"/> Drowsy	<input type="checkbox"/> Eyes do not open to stimulation
<input type="checkbox"/> Non-responsive to stimulation	<input type="checkbox"/> Lethargic	<input type="checkbox"/> Listless	<input type="checkbox"/> Agitated

Acknowledge Reason

Pt does NOT have fever, hypothermia or i... Patient unstable, I will document later

Accept

BPA #2

Clinical Assessment

1. Central cap refill
2. High-risk states
3. LOC

If answers trigger
"risk for sepsis"
then

Triggers
Huddle
Alert

Nursing/Triage Workflow → Yes to vitals (#1) & screen (#2) BPAs → Huddle BPA

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1)

SEPSIS HUDDLE REQUIRED

Central capillary refill: (!) **3 seconds**
High risk sepsis criteria: (!) **Central line**
Level of consciousness: (!) **Crying, inconsolable;Drowsy**

1. Notify team attending that sepsis huddle is required.
2. Click "document" to document results.

If you need to document later:

1. Click "I will alert MD now, document after"
2. Document using "peds sep huddle" section in the triage navigator.

Acknowledge Reason

BPA #3

Huddle occurs

Documented in nursing flowsheet

Can document later in emergent cases

→ "document after" allows for clinical workflow to continue without a hard stop for documentation

**Sepsis huddle results =
clinical assessment from huddle**

Nursing/Triage Workflow → Yes to vitals (#1) & screen (#2) BPAs → Huddle BPA

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1)

SEPSIS HUDDLE REQUIRED

Central capillary refill: (!) 3 seconds
High risk sepsis criteria: (!) Central line
Level of consciousness: (!) Crying, inconsolable; Drowsy

1. Notify team attending that sepsis huddle is required.
2. Click "document" to document results.

If you need to document later:

1. Click "I will alert MD now, document after"
2. Document using "peds sep huddle" section in the triage navigator.

Document Do Not Document Flowsheets

Acknowledge Reason
I will alert MD now, document after

BPA #3

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1)

SEPSIS HUDDLE REQUIRED

Central capillary refill: (!) 3 seconds
High risk sepsis criteria: (!) Central line
Level of consciousness: (!) Crying, inconsolable; Drowsy

1. Notify team attending that sepsis huddle is required.
2. Click "document" to document results.

If you need to document later:

1. Click "I will alert MD now, document after"
2. Document using "peds sep huddle" section in the triage navigator.

Document Do Not Document Flowsheets Collapse

Sepsis Huddle Results

Sepsis Huddle Results

Suspect sepsis Sepsis watcher Low suspicion for sepsis

Acknowledge Reason
I will alert MD now, document after

BPA #4

Accept

Huddle occurs

Documented in nursing flowsheet

Can document later in emergent cases


→ "document after" allows for clinical workflow to continue without a hard stop for documentation

**Sepsis huddle results =
clinical assessment from huddle**

Suspect Sepsis → triggers Provider BPA for ORDER SET

Provider Workflow → Yes to Huddle → Peds Sepsis ORDER SET BPA

BestPractice Advisory - Optime, Chamberlain Three "TreeFiddy"

Sepsis Alert (1) 

⚠ This patient is HIGH RISK FOR SEPSIS

BP: (!) 60/30
Pulse: (!) 150
Central capillary refill: (!) 3 seconds
High risk sepsis criteria: (!) Central line
Level of consciousness: (!) Crying, inconsolable;Drowsy

This patient meets the above high risk for sepsis criteria along with a fever, hypothermia (at home or in ED) or signs of infection. Use the **"EM PEDS SEPSIS WORKUP"** Order Set to evaluate and treat.

[Open Order Set](#) [Do Not Open](#) [EM Peds Sepsis Workup \(13115\) Preview](#)

Acknowledge Reason _____

[Order set not needed based on my clinical...](#) [I will use if needed after I see the pt ...](#)

BPA #5 [✓ Accept](#)

Note

If provider does not open the order set, the "acknowledge reason" needs to be answered to stop BPA from firing each time providers enters chart

Sepsis Huddle Results documented from nursing workflow

"Suspect Sepsis" = Triggers PROVIDER BPA → Open EM peds sepsis order set

Pediatric Sepsis EM Order Set

Includes

Nursing Orders

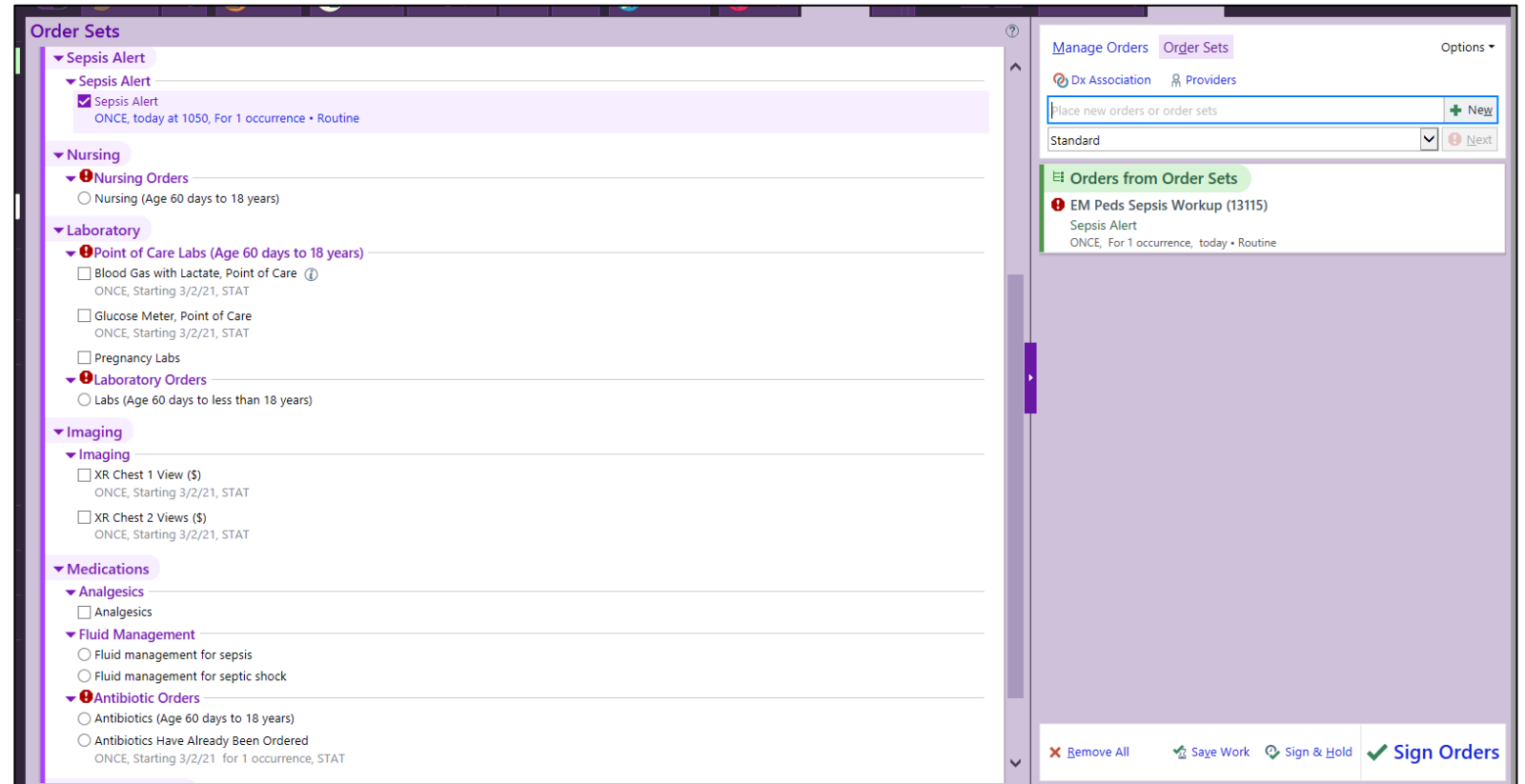
Lab Orders

Imaging

Medications

Fluid
Management

Antibiotic Orders



The screenshot displays a medical order set interface for Pediatric Sepsis. The left pane, titled 'Order Sets', lists various categories with expandable options: Sepsis Alert (checked), Nursing (Nursing Orders), Laboratory (Point of Care Labs, Blood Gas with Lactate, Glucose Meter, Pregnancy Labs), Imaging (XR Chest 1 View, XR Chest 2 Views), Medications (Analgesics, Fluid Management, Antibiotic Orders), and Antibiotic Orders. The right pane, titled 'Manage Orders', shows the 'Order Sets' tab with a search bar, a dropdown menu set to 'Standard', and a 'New' button. Below this, the 'Orders from Order Sets' section displays 'EM Peds Sepsis Workup (13115)' with a 'Sepsis Alert' and a frequency of 'ONCE, For 1 occurrence, today • Routine'. At the bottom right, there are buttons for 'Remove All', 'Save Work', 'Sign & Hold', and 'Sign Orders'.

- ✓ Establish consistent care for children across campuses and providers
- ✓ Create objective metrics, data collection and care evaluations
- ✓ Optimize safe care for children in the ED setting

Provider Workflow → Peds Sepsis ORDER SET

- ✓ Using the order set, certain orders get prioritized
 - Pharmacy → antibiotics
 - Lab/Phlebotomy → blood collection
- ✓ Decision support within the order set

Order Sets

- ▼ Sepsis Alert
 - ▼ Sepsis Alert
 - ☑ Sepsis Alert
ONCE, today at 1050, For 1 occurrence • Routine
- ▼ Nursing
 - ▼ Nursing Orders
 - Nursing (Age 60 days to 18 years)
- ▼ Laboratory
 - ▼ Point of Care Labs (Age 60 days to 18 years)
 - ☐ Blood Gas with Lactate, Point of Care ⓘ
ONCE, Starting 3/2/21, STAT
 - ☐ Glucose Meter, Point of Care
ONCE, Starting 3/2/21, STAT
 - ☐ Pregnancy Labs
 - ▼ Laboratory Orders
 - Labs (Age 60 days to less than 18 years)
- ▼ Imaging
 - ▼ Imaging
 - ☐ XR Chest 1 View (\$)
ONCE, Starting 3/2/21, STAT
 - ☐ XR Chest 2 Views (\$)
ONCE, Starting 3/2/21, STAT
- ▼ Medications
 - ▼ Analgesics
 - ☐ Analgesics
 - ▼ Fluid Management
 - Fluid management for sepsis
 - ▼ Antibiotic Orders
 - Antibiotics (Age 60 days to 18 years)
 - Antibiotics Have Already Been Ordered
ONCE, Starting 3/2/21 for 1 occurrence, STAT

Antibiotic Orders

- ☑ Antibiotics (Age 60 days to 18 years)
 - ☐ Healthy, No Central Line
 - ☐ Immunocompromised and/or Central Line Present
 - ☐ Oncology patient, well appearing
 - ☐ Oncology patient, severe sepsis suspected
 - ☐ Intraabdominal source suspected

Manage Orders **Order Sets** Options ▾

Dx Association Providers

Place new orders or order sets + New

Standard ▾ Next

Orders from Order Sets

- EM Peds Sepsis Workup (13115)
 - Sepsis Alert
ONCE, For 1 occurrence, today • Routine

Remove All Save Work Sign & Hold Sign Orders

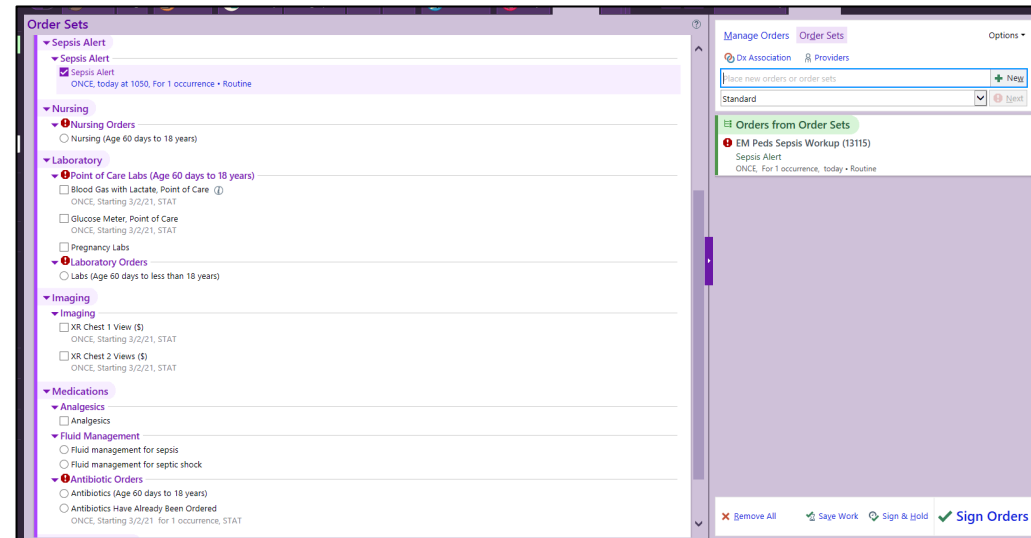
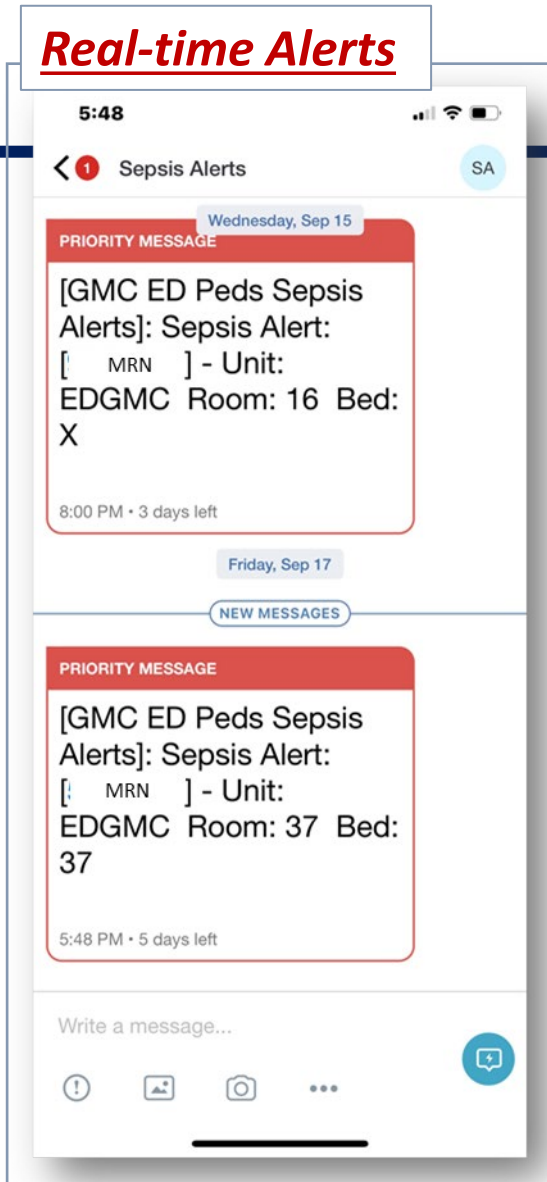
Order Set Antibiotics
Decision Support

Choose a category
to cascade open
preferred antibiotics
with dosing

Provider Workflow → Peds Sepsis ORDER SET

Real-time Alerts

✓ When orders are signed in the order set, an automatic notification is sent to the **ED charge nurse** and to the **PEM medical director** in real time (via priority text page)



Trigger for audit/feedback = when order set is opened and signed

Audit & Feedback to Providers and Staff

- ✓ Real-time text message alert to Peds EM Director
 - *Messages alert if order set has opened*
- ✓ Near-real time audit/feedback – Dashboard Log
- ✓ EMSC meetings monthly
 - *EM focused feedback for campuses for peds order set use, peds sepsis data*

Continuous improvement, multidisciplinary oversight

- ✓ IPSO Team meetings every 2 weeks
- ✓ Iterations of Peds EM order set (feedback, updates, tweaks)



*Integrating Order Set
Use with Simulation*

Resident & Team Engagement



Pediatric Sepsis Dashboard - ED

[Link](#)

Hospital

(All)

☒ (All)

☒ GCMC

☒ GHS

☒ GJSH

☒ GLH

☒ GMC

☒ GWV

Year

(All)

☒ (All)

☒ 2018

☒ 2019

☒ 2020

☒ 2021

Pediatric Sepsis Dashboard

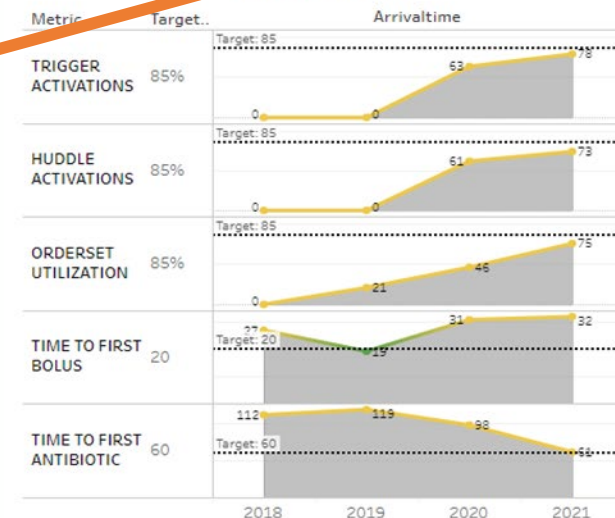
Data Filters

Hospital: (All)

ED Encounter: YES

Year: (All)

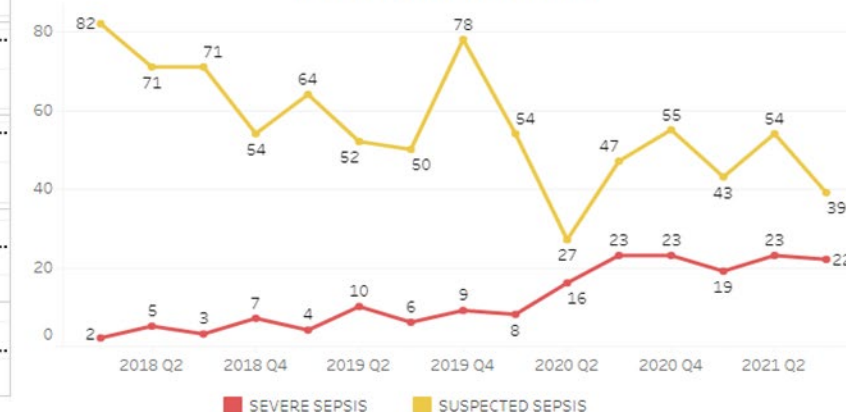
5 Key Process Measures



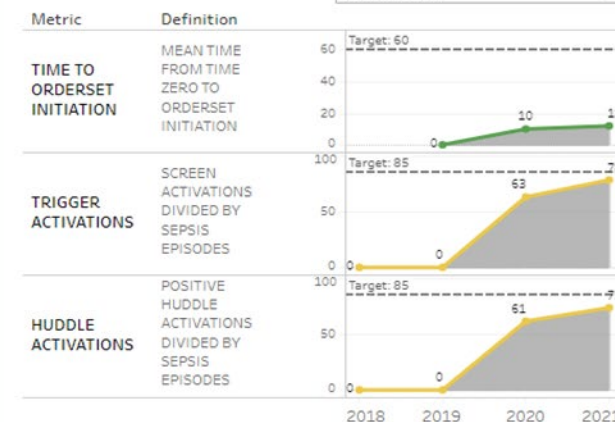
Sepsis Definitions:

<https://www.childrenshospitals.org/-/media/Files/Groups/IPSO/06212019-Reviewed-Technical-Documents/IPSO-Sepsis-Patient-Identification-Guide.pdf?la=en&hash=518A905F8A9A993F5722BCF71AF7BF51D6CE1304>

Sepsis Episode Volumes



Bundle Metrics



Sepsis Category

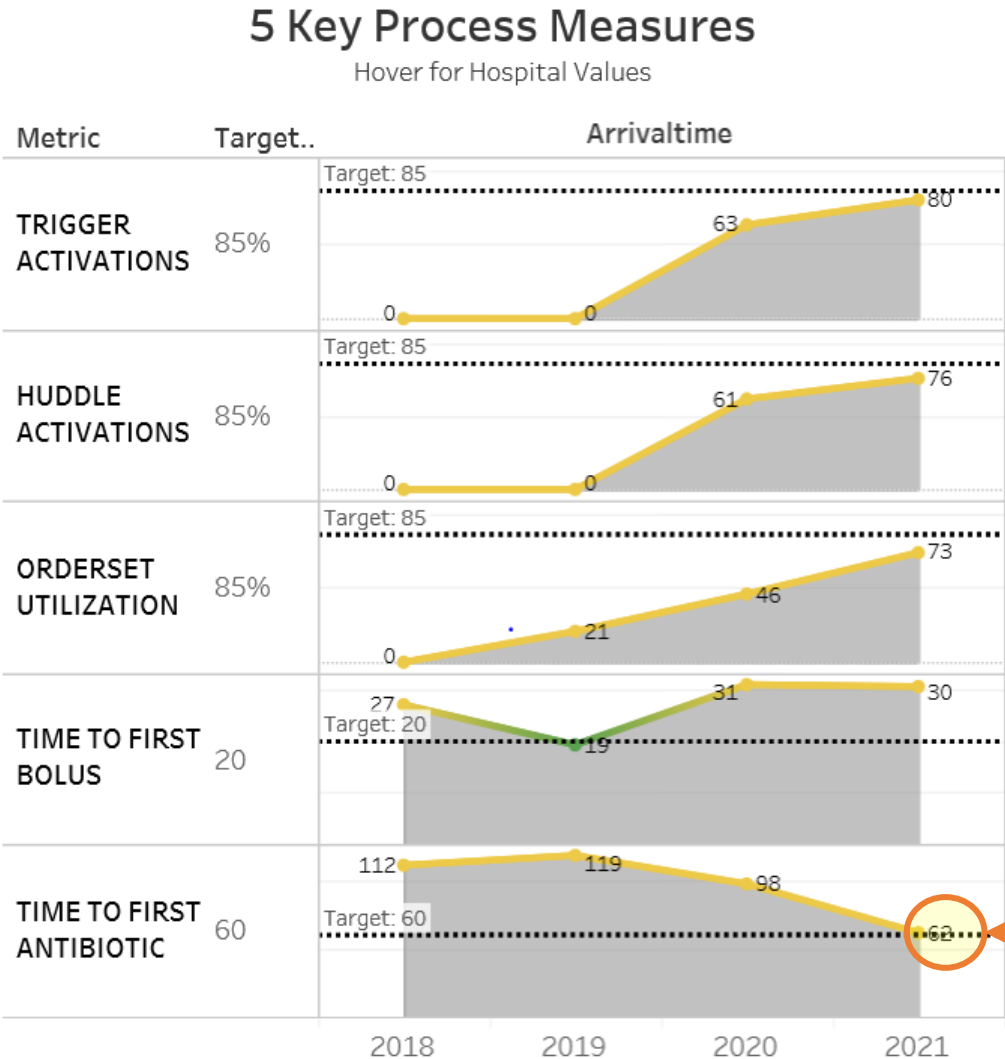
SEVERE SEPSIS

Sepsis Log

Arrivaltime	Hospital	Pat Mrn Id	Positive Screen Treatment	Positive Huddle	ICU Admission + Treatment	Lactate Drawn Treatment	Order Treat
9/9/2021 6	GWV		0	1	0	0	1
9/9/2021 2	GMC		0	1	0	0	1
9/7/2021 1	GMC		0	1	0	0	1
8/25/2021	GWV		0	1	0	0	0
8/23/2021	GWV		0	1	0	0	1
8/23/2021	GMC		0	1	0	0	1
8/23/2021	GMC		0	1	0	0	1
8/20/2021	GMC		0	1	0	0	1
8/12/2021	GMC		0	0	0	0	1
8/8/2021 3	GMC		0	1	0	0	1
8/6/2021 6	GWV		0	0	0	0	1
8/4/2021 4	GMC		0	1	0	0	1
8/3/2021 2	GWV		0	1	0	0	1

ED Successes

- ✓ Trigger Activations increased to almost 80%
- ✓ Huddle Activations increased to 76%
- ✓ Orderset Utilization increased to 73%
- ✓ Time to First Bolus steady at 30 minutes
- ✓ Time to first antibiotic decreased by almost 50%, reaching target of 60 minutes



Hover over a data point to see campus-specific data

Metric:	TIME TO FIRST ANTIBIOTIC			
Target:	60			
Year of Arrivalttime:	2021			
Value:	61			
Color:	YELLOW			
By Hospital:				
Hospital	2018	2019	2020	2021
GCMC	0	0	0	
GHS		0		
GJSH			0	
GLH	0		0	0
GMC	254	152	116	78
GWV	31	0	57	79



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Improving Pediatric Sepsis Outcomes



Learning as we go...

Successes

- Multidisciplinary team
- Upfront work on data tools and analytics (dashboard)
- Focused efforts at 1-2 campus EDs to start, leveraging condensed PEM expertise
- Audit and Feedback

Trainee engagement



- **Informatics fellows**
- **Residents** (EM, Peds, Med-Peds)
 - Order set use
 - Huddles
 - Recognizing the ill child



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Improving Pediatric Sepsis Outcomes



Learning as we go...

Challenges

- Most ED providers and staff are not specifically pediatric trained
- Wide variation in skill sets, experience, level of comfort with sick infants and children
- Changing practice & culture
- EMR efficiency, order set use
- Multiple campuses, broad geographic range
- COVID-19 pandemic
- Manual work for continual audit and feedback

Q&A and Discussion



Welcome to our
Peds ED Zone
GMC in Danville

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Thank you

