



Fireside Chat Abnormal Vital Signs Bundle



August 1, 2023

Acknowledgments

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Thank you for joining!

Session is being recorded and posted online along with slides Utilize the Q&A feature to ask questions

Place your name in the chat for nursing and social work credit Discussion will follow presentation





Objectives

After participating in this session, attendees will be able to:

- Describe how quality measures impact a site's pediatric readiness
- Be familiar with resources that are available to you as you embark on your QI Journey
- Explain the importance of early identification of abnormal vital signs in pediatric patients





Speakers

Sheryl Yanger, MD, FAAP

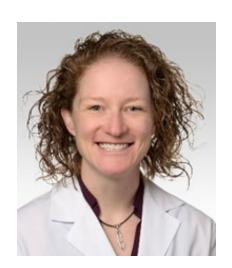
- EIIC Collaboratives Domain Co-lead
- Assistant Professor of Medicine, Department of Pediatrics
- Quality Director, Pediatric Emergency Medicine, Dell Children's Medical Center of Central Texas
- The University of Texas at Austin, Dell Medical School

Emily Roben, MD, MS

- Pediatric Emergency Medicine Physician
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- UCSF Benioff Children's Hospital, Division of Pediatric Emergency Medicine
- Associate Professor, UCSF School of Medicine







Background

This intervention bundle is designed to help guide PRQC teams that want to implement change strategies specific to the clinical care processes for assessment and reassessment of vital signs.







Background



The early identification of patients at risk of clinical deterioration and matching the severity of illness to the appropriate level of care and resources needed are integral components of high-quality emergency medical care.

Abnormal vital signs are key in the early identification of critically ill and injured patients.





Background

Goal: Early identification of abnormal vital signs to ensure timely recognition of patients with potential or established critical illness and to ensure a timely and appropriate response from skilled staff.

Vital sign measurements include: (using appropriately sized tools)

- Temperature
- Heart rate
- Respiratory rate
- Blood pressure
- Pulse oximetry
- *Pain







Vital Sign Assessment and Reassessment

Arrival

Triage

Intervention Workup

Reassessment

Interventions

Disposition





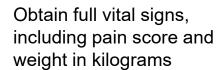








Intervene when vital signs are abnormal







Obtaining and Detecting Abnormal Vital Signs:



- At triage: Recognition of potentially sick patients
- Reassessment: Detection of clinical deterioration
- Appropriate and timely responses at each phase





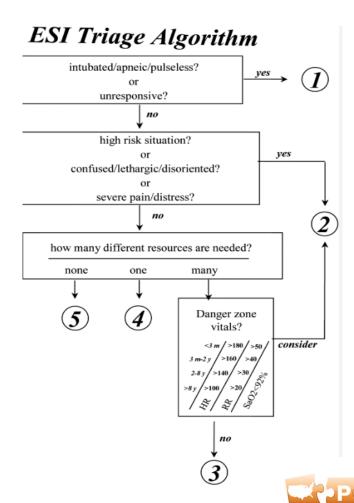
Triage

ESI TRIAGE



- Requires immediate life saving intervention. Many resources required. Must be seen immediately.
- Situation could progress to severe without intervention. Requires many resources. Seen within 10 minutes.
- Has the potential to increase in severity if not treated.
 Requires 3 or more resources. Seen within 30 minutes.
- Not severe or life threatening. Requires 1-2 resources. Seen within 60 minutes.
- Not life threatening in any way. No resources required. Can wait for treatment.





National

Pediatric Readiness Quality Collaborative
Ensuring Emergency Care for All Children

Correct Equipment and Techniques

- Pediatric pulse ox probes
- Appropriate BP cuff sizes
- Rectal temps in infants, small children (<2y),critically ill patients
- Comfort holds









MORE COMFORT, Less Pain MÁS COMODIDAD, Menos Dolor

These techniques reduce pain during procedures. Make a plan with your nurse before every procedure. Estas técnicas reducen el dolor durante los procedimientos. Haga un plan con su enfermera antes de cada procedimiento.



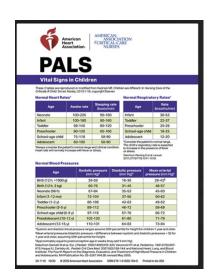
Pain Management Control del dolor Comfort positions Posiciones de comodidad Distraction for every age Distracción para todas las edades Bebés | (de 0 a 12 meses) Blowing bubbles or a pinwheel Soplando burbujas o un molinete Niños pequeños y en edad preescolar / de 1 a 5 años Toys and games Juguetes y juegos Niños en edad escolar / de 6 a 11 años Reading or activity books Libros de lectura o de actividades Adolescente / de 12 a 18 años





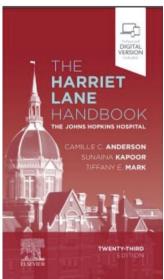
Standards for Normal

In order to recognize what is abnormal, must first have age based standards for normal VS ranges



Playing / Appropriate Sleeping Irritable Irritable Irritable		0	1	2	3	Score
OR capillary refill adjuster of the capillary refill and seconds of the capillary refill and t	Behavior		Sleeping	Irritable	OR • Reduced response	
normal parameters, Ne parameters OR parameters on the parameters of the parameters o	Cardiovascular	OR capillary refill	OR capillary refill	cyanotic OR Capillary refill 4 seconds OR Tachycardia of 20 above	mottled OR Capillary refill Seconds or above OR Tachycardia of 30 above normal rate OR	
Score 2 extra for every 15-minute nebs (Includes continuous nebs) or persistent post-op vomiting. Use "filez" note over a high flow nasal cannula. Heart Rote (2009) Detecting and managing detectoration in children. Paediatric Numing. 17, 32-35. Adapted for use at Children's of Minnes Heart Rate (Respiratory Rote) at rest at rest at rest	Respiratory	normal parameters,	parameters OR • using accessory muscles OR • 30+%Fi02 or	normal parameters OR • Retractions OR • 40+%Fi02 or	parameters with retractions or grunting OR • 50+%Fi02 or	
at rest at rest	Score 2 extra f Use "liters/min Use "Fi02" to	or every 15-m ute" to score score a high fl	inute nebs (includes o regular nasal cannula ow nasal cannula.	Paedlatric Nursing, 17, 32-	35. Adapted for use at Children's of M	innesota.
lewborn (birth - 1 month) 100-180 40-60					at rest	Rate
100 100	ewborn (birth	- 1 month)		100-180 40-60		

STATE OF THE PARTY	Heart Rate at rest	Respiratory Rate at rest
Newborn (birth - 1 month)	100-180	40-60
Infant (1 – 12 months)	100-180	35-40
Toddler (13 months – 3 years)	70-110	25-30
Preschool (4 – 6 years)	70-110	21-23
School Age (7 - 12 years)	70-110	19-21
Adolescent (13 – 19 years)	55-90	16-18

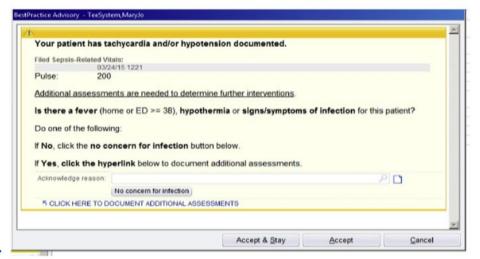






Notification System

- Notify providers of abnormal VS
- Trigger reassessments



02,01/VB02 Possible SIRS Pe	3	1
04,01	3	
15,01	3	
17,01 Sepsis Screen	2	





PEDIATRIC SEPTIC SHOCK COLLABORATIVE TRIAGE TRIGGER TOOL

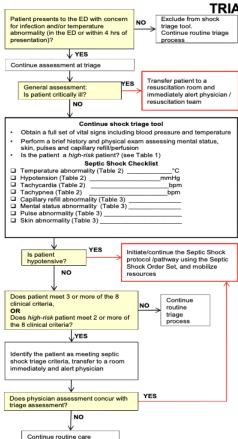


Table 1. High Risk Conditions

- Malignancy
- Asplenia (including SCD)
- · Bone marrow transplant
- Central or indwelling line/catheter
- Solid organ transplant
- Severe MR/CP
- · Immunodeficiency, immunocompromise or immunosuppression

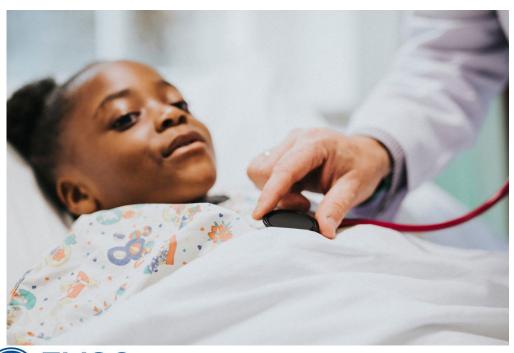
Table 2. Vital Signs (PALS)					
Age	Heart Rate	Resp Rate	Systolic BP	Temp (°C)	
0 d - 1 m	> 205	> 60	< 60	<36 or >38	
≥ 1 m - 3 m	> 205	> 60	< 70	<36 or >38	
≥ 3 m - 1 r	> 190	> 60	< 70	<36 or >38.5	
≥ 1 y - 2 y	> 190	> 40	< 70 + (age in yr × 2)	<36 or >38.5	
≥ 2 y - 4 y	> 140	> 40	< 70 + (age in yr × 2)	<36 or >38.5	
≥ 4 y - 6 y	> 140	> 34	< 70 + (age in yr × 2)	<36 or >38.5	
≥6 y- 10 y	> 140	> 30	< 70 + (age in yr × 2)	<36 or >38.5	
≥ 10 y - 13 y	> 100	> 30	< 90	<36 or >38.5	
> 13 y	> 100	>16	< 90	<36 or >38.5	

Table 3. Exam Abnormalities				
	Cold Shock	Warm Shock	Non-specific	
Pulses (central vs. peripheral)	Decreased or weak	Bounding		
Capillary refill (central vs. peripheral)	≥ 3 sec	Flash (< 1 sec)		
Skin	Mottled, cool	Flushed, ruddy, erythroderma (other than face)	Petechiae below the nipple, any purpura	
Mental status			Decreased, irritability, confusion, inappropriate crying or drowsiness, poor interaction with parents, lethargy, diminished arousability, obtunded	





Why is this important?



Tachycardia can be sign of:

- Fever
- Anxiety
- Pain
- Dehydration
- Early indication of shock:
 - Sepsis
 - Myocarditis
 - Hypovolemia





Challenges

- Early, accurate recognition of pediatric severe sepsis is challenging
- Many children present initially with compensated shock and no apparent hypotension
- Difficult to differentiate rare severe sepsis/septic shock from many non-septic patients with fever and tachycardia





Sepsis Screening

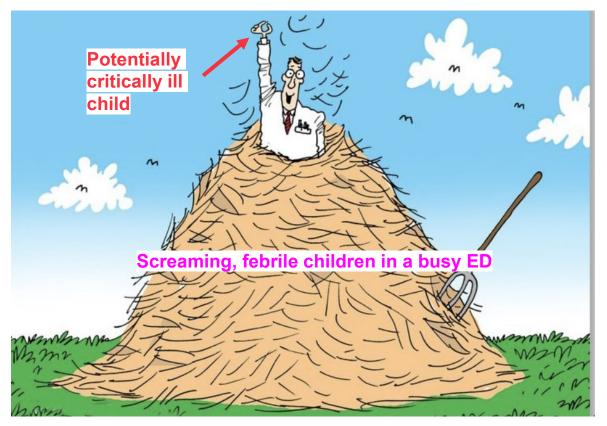
From: Pediatric sepsis screening in US hospitals

Author	Year	Framework	Form	Population screened	Reference standard	Sens (%)	PPV (%)
Cruz et al. ¹³	2012	Internally derived	Automated alert followed by manual screen	All ED patients	Shock diagnosed by ED attending	81	4
Sepanski et al. ¹²	2014	Modified SIRS	Automated	All ED patients	Presence of SIRS with organ dysfunction among patients with specific diagnosis codes or who met alert criteria	97	49
Lane et al. ²²	2016	PSSC	Manual	Fever or suspected infection	Internal criteria derived from ACCM guidelines ²⁰	99	20
Balamuth et al. ³¹	2017	PSSC	Automated alert followed by manual screen	All ED patients	Use of ED sepsis protocol or ICU admission meeting Goldstein ²⁵ severe sepsis/septic shock criteria within 24 h	86	25
Lloyd et al. ²⁷	2018	PSSC	Automated	All ED patients	Use of ED sepsis protocol	NR	NR
Eisenberg et al. 32	2021	Modified SIRS	Automated	All ED patients	Goldstein ²⁵ severe sepsis/septic shock criteria or ICD code for severe sepsis/septic shock within 24 h	85	4

ED emergency department, ICU intensive care unit, NR not reported, PPV positive predictive value, PSSC Pediatric Septic Shock Collaborative, Sens sensitivity, SIRS systemic inflammatory response syndrome.



National







Pediatric Sepsis

Sepsis is the leading cause of morbidity and mortality worldwide

- Annual healthcare costs in US >\$15 billion
- Mortality in children < adults, up to 10%
- 80% increase in pediatric severe sepsis 1995 to 2005*
- Septic shock >50% of shock presenting to peds ED^





Systemic Inflammatory Response Syndrome (SIRS)

At least two criteria:

Core temperature <36 or >38.5°C

And/or

 WBC elevated or depressed for age plus

- Tachycardia (or bradycardia in infants)
- Tachypnea
- >10% immature neutrophils





Surviving Sepsis

- International initiative, consensus guidelines
- Decrease mortality from severe sepsis/septic shock
- Early goal-directed therapy







Guided Interventions



Recognize decreased mental status and perfusion. Begin high flow O₂. Establish IV/IO access.

Initial resuscitation: Push boluses of 20 cc/kg isotonic saline or colloid up to & over 60 cc/kg until perfusion improves or unless rales or hepatomegaly develop.

Correct hypoglycemia & hypocalcemia. Begin antibiotics.

shock not reversed?

Fluid refractory shock: Begin inotrope IV/IO.

use atropine/ketamine IV/IO/IM

to obtain central access & airway if needed.

Reverse cold shock by titrating central dopamine
or, if resistant, titrate central epinephrine

Reverse warm shock by titrating central norepinephrine.

dose range: dopamine up to 10 mcg/kg/min, epinephrine 0.05 to 0.3 mcg/kg/min.

If 2nd PIV start

inotrope.

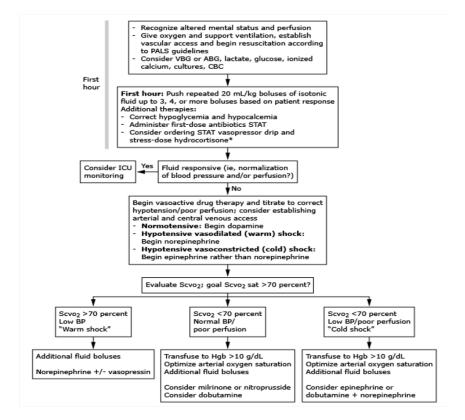
shock not reversed?

Catecholamine resistant shock: Begin hydrocortisone if at risk for absolute adrenal insufficiency





PALS Septic Shock Algorithm







Early Recognition = Improved Outcomes

- Decreased organ dysfunction
- Decreased hospital and ICU LOS
- Decreased mortality





Quality Measures

Phase of Care	Quality Measures		
Assessment	Percentage of pediatric patients with their weight documented in kilograms only		
	Percentage of pediatric patients with pain assessed		
	Percentage of pediatric patients with vital signs re-assessed		
Intervention	Median time from collection of first set of vital signs to first intervention		





Choosing Measures for Your Site

Arrival

Triage

Intervention Workup

Reassessment

Interventions

Disposition





Obtain full vital signs,

weight in kilograms

including pain score and









Intervene when vital signs are abnormal







Local aim statement

Your hospital's aim statement goes here, for example: Reduce the time from collection of the first set of vital signs to the first intervention of any kind from 75 minutes to 25 minutes by December 2024.

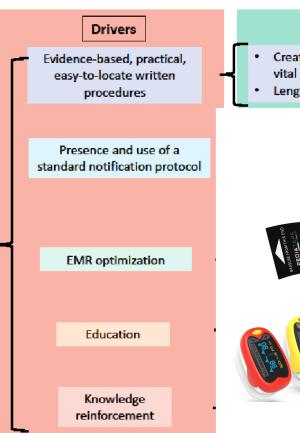
Drivers Evidence-based, practical, easy-to-locate written procedures Presence and use of a standard notification protocol **EMR** optimization Education Knowledge reinforcement





Local aim statement

Your hospital's aim statement goes here, for example: Reduce the time from collection of the first set of vital signs to the first intervention of any kind from 75 minutes to 25 minutes by December 2024.



Intervention strategies

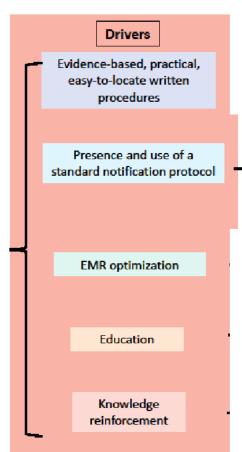
- Create a written procedure guideline for vital signs in pediatric patients
- Length-based tape available in triage





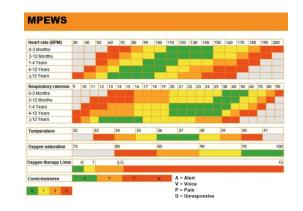


Local aim statement



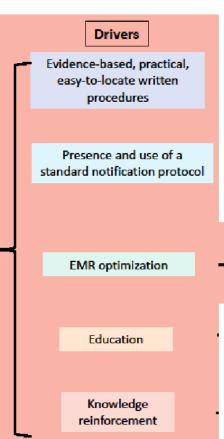


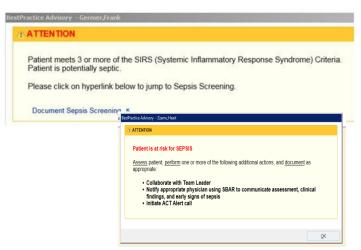
- · Adopt a validated triage tool
- Establish criteria for activating a notification system
- Establish the process and components of notification system
- · Implement standing orders in triage



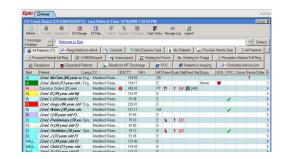


Local aim statement



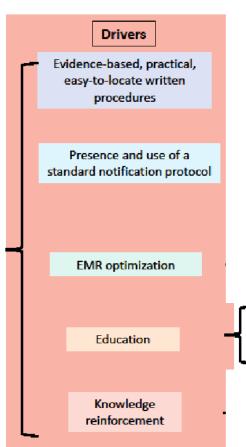


- EMR alerts for vital signs out of range
- Integrate clinical decision support tool to combine patient factors into alerts
 - Color coding system for patient charts





Local aim statement



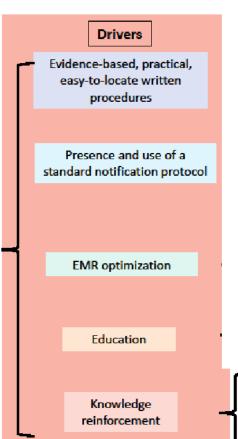


- Develop training education for care team
- Identify training modality
- · Present new information at staff meetings





Local aim statement

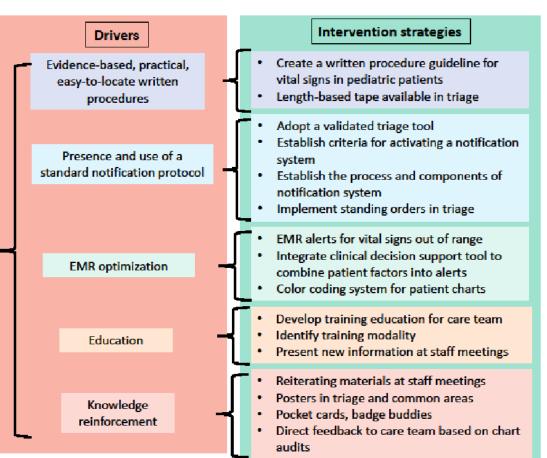




- Reiterating materials at staff meetings
- Posters in triage and common areas
- · Pocket cards, badge buddies
- Direct feedback to care team based on chart audits



Local aim statement





Summary

Background on the importance of pediatric vital sign assessment and reassessment

Quality measures for pediatric readiness

Basic structure of determining your site's aims, drivers, and interventions





Things to Consider

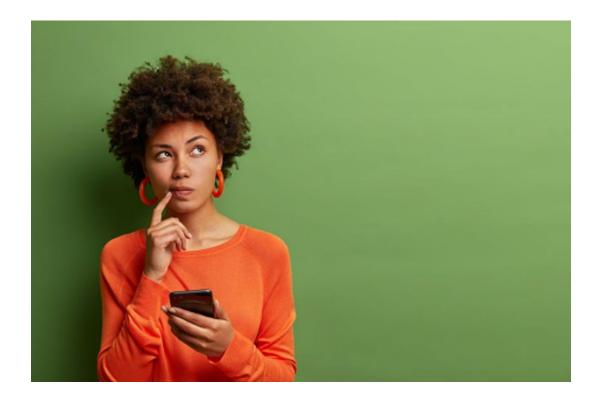
Why is this bundle right for your site?

- Vital sign assessment and reassessment is a great place to START
- Vital signs are at the core of how we evaluate and begin our management of ALL patients
- This bundle will employ some SIMPLE and STRAIGHTFORWARD tools that you can implement
- The data analysis is likely to be manageable and we anticipate that YOU WILL SEE RESULTS!





Q&A Session







Complete Registration for the Data Platform

- Share demographics
- Provide data platform users
- Include name, email, phone # of POA signatory
- Upload signed POA to data portal registration



Register for the Next Fireside Chat

- August 8, 2023
- 1-2 pm CT
- Topic: Weight in Kilograms







Patient Safety



QI and Data Sampling



Data Literacy in a QI Project



September 5, 2023

Join us for upcoming sessions





Nursing - CE contact hours

Fireside Chat #4 August 1, 2023

- 1. Enter your <u>first</u> and <u>last name</u> in the **chat** if you have not done so already
- 2. Scan the QR code/use link to access session evaluation
- 3. Submit completed evaluation by 1700 (Pacific) on <u>8/03/2023</u> to be eligible for CE hours



https://bit.ly/PRQCFireside4

If you have any questions, please contact Robin Goodman at robin.goodmanrn@gmail.com

BRN CE Provider: Pediatric Liaison Nurses Los Angeles County. Provider approved by the California Board of Registered Nursing, Provider # 15456, for 1 Contact Hours





Social Work Professionals – CEU's Fireside Chat #4 August 1, 2023

- 1. Enter your <u>first</u> and <u>last name</u> in the **chat** if you have not done so already
- Scan the QR code/use link to access session evaluation



https://utexas.qualtrics.com/jf e/form/SV 5gopiw6YInB4TWe





Please Complete Session Evaluation Thank you!





