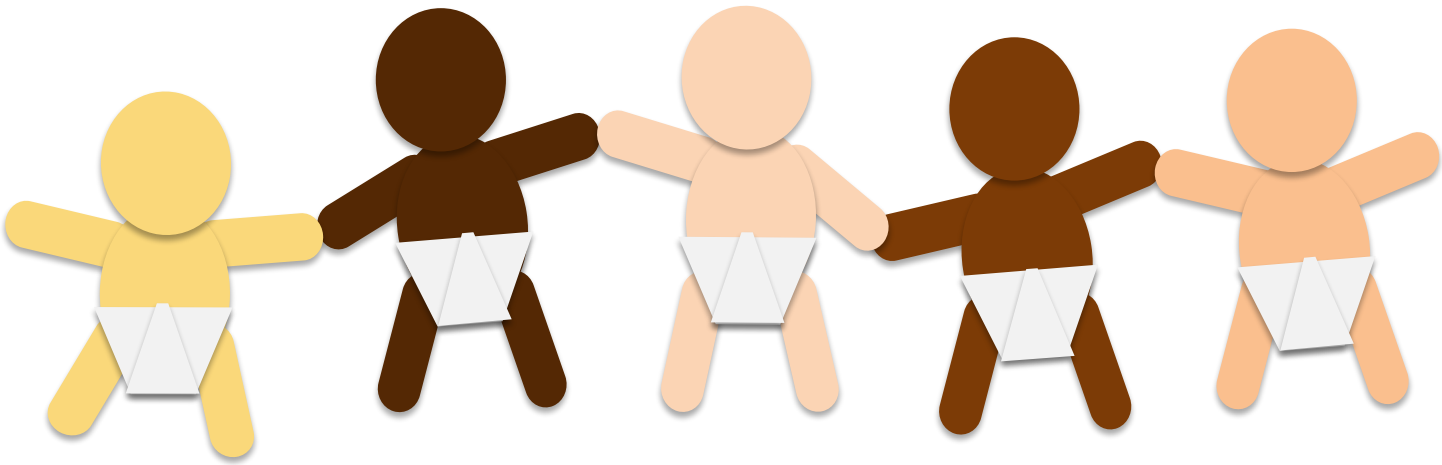
SimBox+
Tele SimBox

Non-Accidental Trauma



Emergency Department/Hospitalist/Resident

Contents
with links to pages

After this activity, the team will be able to manage a pediatric patient with concern for non-accidental trauma with emphasis on the following objectives:

1. Prioritize treatment of potential etiologies to guide stabilization or escalation of care for an infant with vomiting.
2. Identify non-accidental trauma and activate local protocol for reporting.
3. Determine the appropriate destination for transfer.

Overall Scenario Schema

Link to Pre-briefing Script for SimBox/SimBox+

2 mins

Play video to team
Assign or Coach them to allocate roles

Team Leader	Resident/ MS	Bedside RN
Respiratory Tx	Medication RN	Technician

6-10 mins

Stem: You are called to assess a 7 month old baby with vomiting. On exam, you notice a bruise on the left ear and back.

Your team will focus on the management of an infant with possible non- accidental trauma.

Telesim Co-facilitator prompts are indicated in these boxes

15 mins

Link to Debriefing Script

10 mins

Option: re-run scenario

Scenario script:

"You will hear a brief EMS patch and then see a two minute countdown clock as you prepare for the arrival of the patient."

Link to ED Non-Accidental Trauma Video

Facilitator states: "ED, ED this is an ALS unit, coming in with a 7 month old infant with vomiting. We will be there in 2 minutes."

Time 0

- Team assembles and confirms roles
- Asks for equipment: monitor, temperature, oxygen, breathing (nasal cannula, bag-mask ventilation), access, Broselow tape/ app
- Asks for help

"The patient has arrived. You see a 7 month old baby who is crying and actively vomiting. He has not had any fever or diarrhea."

1

HR 150
BP 90/40
RR crying
Sat 99% RA

- Team places pulse oximeter, cardiac monitor, and BP cuff on the patient
- Uses Broselow tape/ app for weight and/ or asks parent
- Performs ABCDE

"Vomiting has stopped. The patient appears tired but is alert and looking around. Airway is patent, breath and heart sounds are normal, and CRT is 3 seconds."

2

HR 160
BP 92/51
RR 24
Sat 99% RA
CRT 3sec

- Team notes tachycardia and prolonged CRT
- Asks for POC glucose
- Asks for IV access
- Obtains SAMPLE history

" POC glucose is 120. Working on the IV."

SAMPLE history:

Signs/ symptoms: Fussy for the past few days. Today, he has been crying more and has vomited many times. No blood or green content in the vomit. Has not been able to keep anything down today. Only one wet diaper since he woke up this morning. No fevers.

Allergies/ Medications: None.

Past Medical History: Term delivery, no medical problems, up to date with immunizations.

Last meal: One oz of formula, one hour prior.

Events: No injuries, no sick contacts per parent.

Case progression: Non-Accidental Trauma

"As the nurse is undressing the baby to place the IV, she asks for you to look at the baby's skin; there is a large purple- green bruise on the baby's arm."

3

HR 160
BP 94/52
RR 30
Sat 100% RA
CRT 3 sec
T 36 C

- Team notes bruise and requests full skin exam
- Suspects head/ spine injury and asks for cervical spine collar
- Asks parent for etiology of the bruises

"PIV placed in right antecubital fossa. Full skin exam demonstrates multiple bruises in the arms, back and behind the left ear. No other facial or scalp injuries or bruises visible. The parent is visibly upset and says that they have no idea how they baby developed these bruises."

4

HR 170
BP 89/50
RR 42
Sat 100% RA

- Team verbalizes concern for non- accidental trauma and head injury
- Assigns team member to talk to the parents to obtain further social history (who is with the baby at home/ daycare)
- Orders 20 mL/kg normal saline bolus
- Examines mouth and eyes

" No frenulum or oral injuries. No subconjunctival hemorrhages. Bolus infusing. Patient still crying inconsolably. The parent becomes quite agitated. They threaten to leave the Emergency Department."

5

HR 130
BP 100/60
RR 38
(not part of the video)

- Team verbally de-escalates parent
- Discusses workup for non- accidental trauma (locally if available, or at higher level of care)
  - Bloodwork
  - Imaging (X-rays, head imaging, abdominal imaging)
  - Skeletal survey
- Informs parents that Social Work will have to be consulted

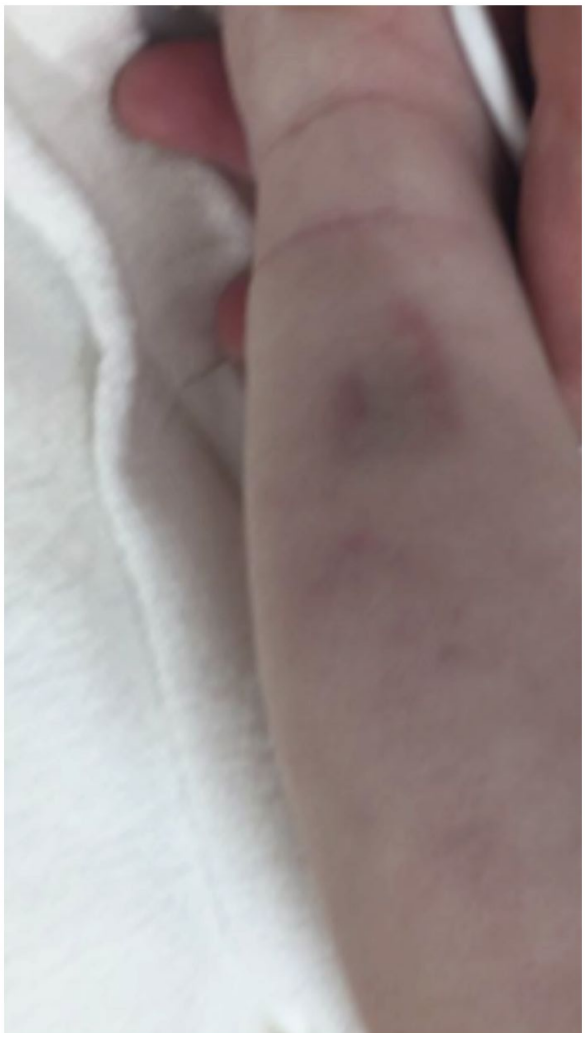
"A head CT shows bilateral subdural hemorrhages without significant edema, mass effect, or midline shift. Bloodwork is unremarkable."

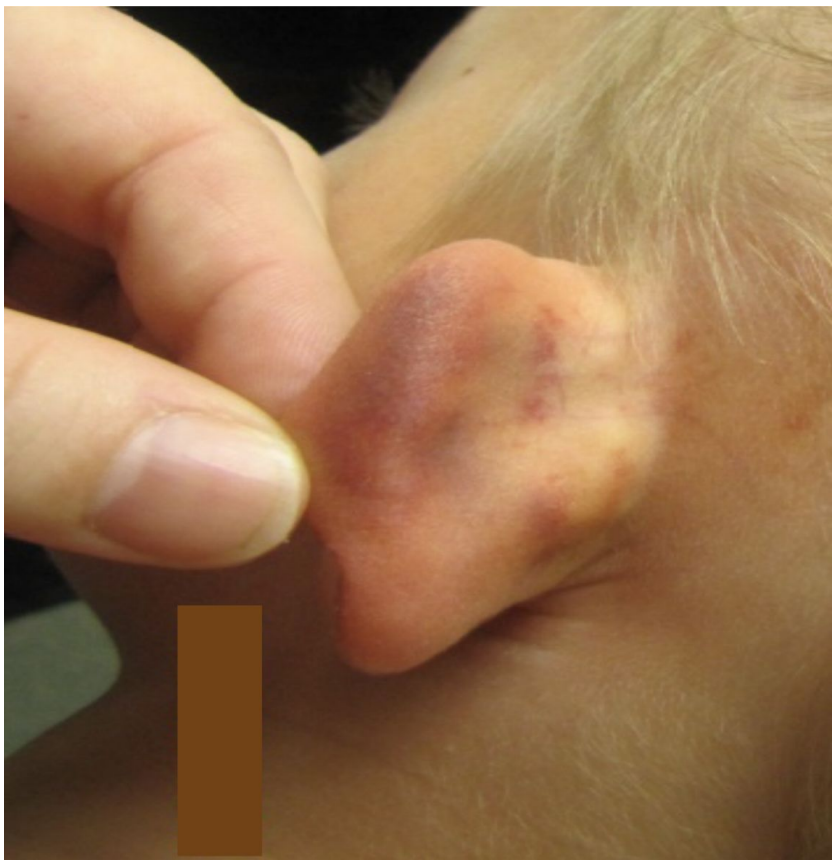
Wrap

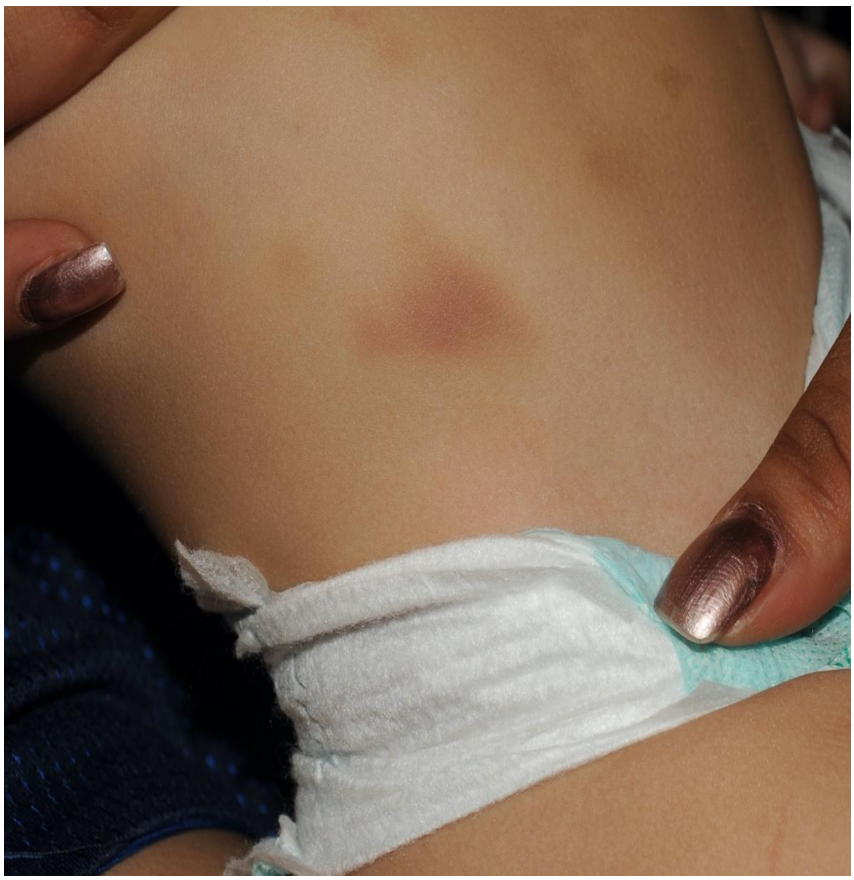
- Team notes subdural hematomas and consults neurosurgery, as well as surgery for a full trauma evaluation.
- Decides appropriate destination for transfer: PICU locally or at referral center
- Discusses with Social Work and signs out to the receiving team

After team performs handoff, state
"This concludes the simulation" and move to debrief.
Link to educational content

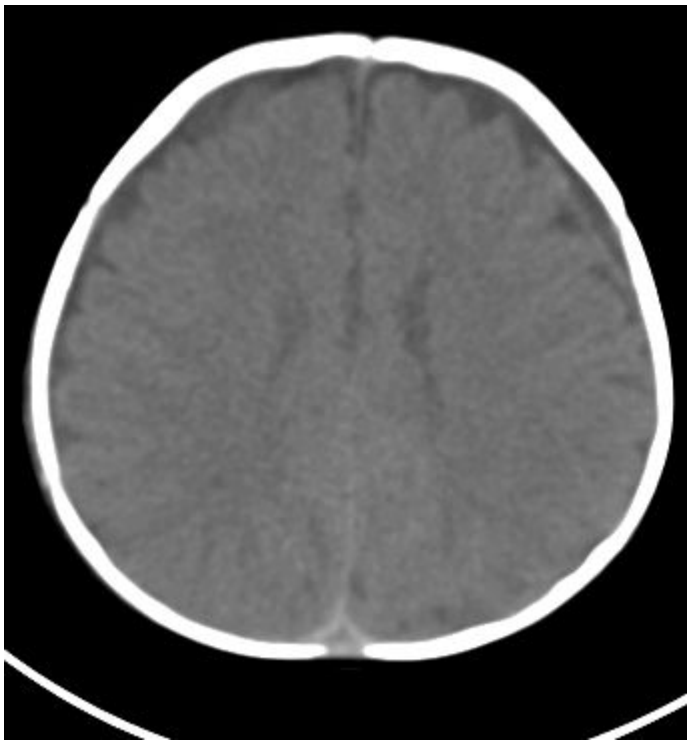
Skin Exam Findings







Ref: www.identifychildabuse.org Denise Abdoo, PhD, CPNP and Kathleen Adelgais MD, University of Colorado School of Medicine, Children's Hospital Colorado, Kempe Center, Aurora, CO



Case courtesy of Jeremy Jones, Radiopaedia.org, rID: 10236

Blood tests:
WBC 13.4 x1000/µL
Hgb 10.4 g/dL
HCT 33.20%
PLT x1000/µL
pH 7.40
PCO2 32
PO2 46
HCO3 20.1
BE -5
Na 135 mmol/L
K 3.9 mmol/L
Cl 98 mmol/L
CO2 24 mmol/L
AG 12
BUN 18 mg/dL
Cr 0.3 mg/dL
Gluc 110 mg/dL
ALT 25 U/L
AST 30 U/L

TASK		DONE CORRECTLY	NOT DONE CORRECTLY	NOT DONE
Team-centered care	Team verbally assembles the necessary staff, equipment and resources to care for an infant with vomiting.			
	Demonstrates effective teamwork and communication (i.e. designate leader/roles, directed orders, closed-loop communication, sharing mental model).			
	Demonstrates appropriate PPE.			
	Calls for additional resources early (social work and/ or child abuse team consult).			
Family-centered care	Obtains an appropriate history from the family member (SAMPLE).			
	Addresses family concerns, updates on care (translates medical aspects of care in plain language).			
Medical knowledge	Formulates a broad differential for an infant presenting with vomiting.			
	Requests full skin exam.			
	Asks details about the injury from the parents.			
	Verbalizes that there is concern for non- accidental trauma.			
	Discusses workup for non- accidental trauma, including head imaging.			
	Diagnoses and manages dehydration secondary to vomiting.			
Communication	Discusses with the parents the reason for the medical workup.			
	Demonstrates handoff of care at the end of the case to SW and/ or Child Abuse Consult team.			

Prebriefing Script

Best practices for establishing psychological safety in simulation.

Basic Assumption: "We believe that everyone participating in our activities is intelligent, capable, cares about doing their best and wants to improve."
Center for Medical Simulation, Boston MA

Prebrief

Welcome your team, make introductions:
"This simulated resuscitation is to practice our team's response to an emergency. We will spend about 15 minutes in simulation, then we will debrief for 20 to discuss what went well and what could be improved with input from the team. Even though it is not real, and the manikin can't be harmed, everyone will get the most out of this scenario if we take it as seriously as possible."

Describe

Describe simulator capabilities, equipment and how to participate:

"Act as you would within your role. You will not get monitor feedback unless your equipment is attached to the patient. Airway equipment should be attached to oxygen, etc. Try to make tasks realistic and timely using your equipment. Please ask for clarifications."

Demo

DEMO: Closed loop communication.
Know your role and task designation. Use closed loop communication to verify and complete.

Leader: Tech, we need an EKG.
Tech: OK going to get the machine.
Tech: OK, I've got the EKG machine here.

Disclose

If a safety concern arises during the simulation, I will state:
"Let's take a safety pause."
If a real event happens that is not part of the simulation, I will state:
"This is not a simulation."
Disclose if video recording, privacy and permission.

Components of a Debrief (Based on 3Ds + PEARLS)

"The purpose of this debrief is to discuss areas of great performance and discover areas for improvement. It is not a blame session- everyone is here to do their best."

Defuse
1-2 min

Solicit emotions and reactions:
"Reactions?"; "Let's take a moment to gather our thoughts."

Discover
7-8 min

Clarify facts:
"Can a teammate share a short summary of the case?"
"Were there other thoughts?"

Explore Performance:
"What went well?"
"What could be improved?"

Use observations of learner experiences to highlight strengths of the team and individuals, while asking learners for their thoughts, observations and reflections.

Deepen
1-2 min

Identify patient care priorities. Then provide focused feedback and specific areas of opportunity for improvement. Elicit any other outstanding issues or concerns.

Summary
1-2 min

Identify take-home points to apply to future practice: Round the room reflections and thanks for participation.

This page provides possible questions to elicit teaching points during the debrief. We are tailoring content for each objective. These questions are not meant to replace your team's discussion, but can help to steer the debriefing session.

PERFORM A SYSTEMATIC ASSESSMENT OF AN ILL INFANT

How does your team perform a systematic assessment of an ill infant?

PAT Pediatric Assessment Triangle: Appearance/ Breathing/ Color.

- Appearance TICLS: tone, interactivity, consolability, look/gaze, speech/cry.
- Work of breathing: Important to undress visualize WOB.
- Circulation/capillary refill: Where and how is this assessed in the pediatric patient?

PERFORM A COMPLETE PHYSICAL EXAM

What are ways in which the physical exam of an infant is different than that of an older child or adult?

Inability to verbalize location of pain requires you to do a full head to toe skin exam with all clothing removed including the diaper, in any child <2 years of age.

WHAT MNEMONIC IS HELPFUL WHEN CONSIDERING A BROAD DIFFERENTIAL DIAGNOSIS?

VINDICATE: Vascular, Infection, Neoplasm, Degenerative, Iatrogenic/Intoxication, Congenital, Autoimmune/Allergic, Traumatic, Endocrine/Metabolic.

VITAMINS: Vascular, Infection, Trauma, Autoimmune, Metabolic, Iatrogenic, Neoplastic, Syndromes/Genetic.

DESCRIBE PHYSICAL EXAM FINDINGS CONCERNING FOR ABUSE

What physical exam findings are most concerning for possible child abuse or neglect?

- Mnemonic: TEN4-FACES. Bruising to TEN region (Torso, Ear, Neck) in a child <4 years of age or Face (specifically Frenulum, Angle of jaw, Cheek, Eyelid, Sclera). ANY bruising in infants ≤4 months of age is concerning.

*See local protocols for NAT workup or a sample pathway here: Physical Abuse Clinical Pathway — Emergency Department from CHOP

DISCUSS THE IMPORTANCE OF FAMILY CENTERED CARE INTERACTIONS

How does the team manage the reactions of parents/guardians when discussing possible abuse?

- As a mandatory reporter you are required by law to report any concern for possible child abuse or neglect. Remind the families that as a healthcare provider your first priority is the safety of their child.
- Setting expectations for the remainder of the ER visit prior to Social Work or Child Protection Team Consults is important so as not to surprise families when these providers introduce themselves.

Making a CPS Report

All healthcare providers are mandated reporters and MUST report any concern for suspected child abuse within 48 hours. This task cannot be delegated!

Gather Information

- Living situation - get as much information as possible regarding the living situation as possible. Physical location of where the patient lives and who lives inside the home with the patient. One of the most important questions CPS will need to know is if there are other children involved, their relationship to the patient, and ages.
- Details of the injury or concern - Be specific about the reason you are calling. Write the details of the event down so you can reference the material during the call and not leave important information out. It is important to obtain where the injury occurred, explanations for how the injury occurred, report changing stories, and if the mechanism is inconsistent with the injury.
- Contact Information - CPS will need the names of all parties involved in your report (caregivers, babysitters). They will need names, addresses, and phone numbers. Finding this information before you call could be very helpful.
- Other Caregivers - If there are other caregivers who are also concerned and have additional information to add you can provide their contact information to your report when you call. They may file their own report or they will be contacted from your information.

Report to the State in which the injury occurred

- State Reporting - Report to the state in which the injury occurred, regardless of where the patient is seeking medical care or lives.
- Calling vs Online Reporting - If you need immediate assistance from CPS (response within 24 hours) PLEASE CALL AND MAKE A REPORT! This is for critical patients, rule out non-accidental traumas, and any patient you are concerned for their immediate safety or the safety of their siblings.
- Law enforcement - Law enforcement must also be notified (city or county of residence).

Questions to ask before calling CPS

- Where does the patient live?
- Who lives with the patient (mom, dad, siblings, boyfriend, girlfriends, aunts, uncles, grandparents, friends of mom or dad)?
- Names and contact information of any adults living with the patient
- Names and ages of any siblings
- Who has been with the child surrounding the time of injury (daycare, grandparents, school)

Support

- Teammates - Utilize this document and your fellow teammates who have made reports to CPS if you are unsure or if this is your first time.

TEN-4-FACESp

Bruising Clinical Decision Rule for Children < 4 Years of Age

When is bruising concerning for abuse in children < 4 years of age?
If bruising in any of the three components (Regions, Infants, Patterns) is present without a reasonable explanation, strongly consider evaluating for child abuse and/or consulting with an expert in child abuse.

REGIONS

TEN

Torso | **E**ars | **N**eck

FACES

Frenulum
Angle of Jaw
Cheeks *(fleshy part)*
Eyelids
Subconjunctivae

INFANTS

4 months and younger

Any bruise, anywhere

PATTERNS

Patterned bruising

Bruises in specific patterns like slap, grab or loop marks

See the signs

Unexplained bruises in these areas most often result from physical assault.
TEN-4-FACESp is not to diagnose abuse but to function as a screening tool to improve the recognition of potentially abused children with bruising who require further evaluation.

TEN-4-FACESp was developed and validated by Dr. Mary Clyde Pierce and colleagues. It is published and available for FREE download at **luriechildrens.org/ten-4-facesp**.

Ann & Robert H. Lurie Children's Hospital of Chicago

RECOGNIZING AND RESPONDING TO CHILD ABUSE

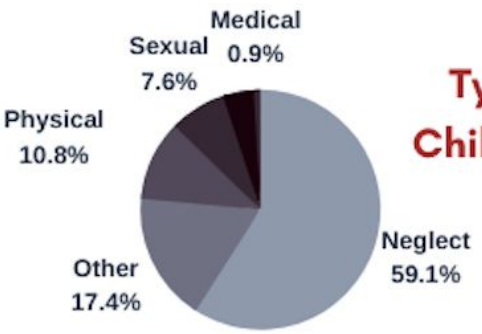
"Physical or mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18 by a person who is responsible for the child's welfare."

INTRODUCTION

60 Seconds
Every minute another child will be a victim of abuse

3.6 Million
referrals for child abuse per year

Types of Child Abuse

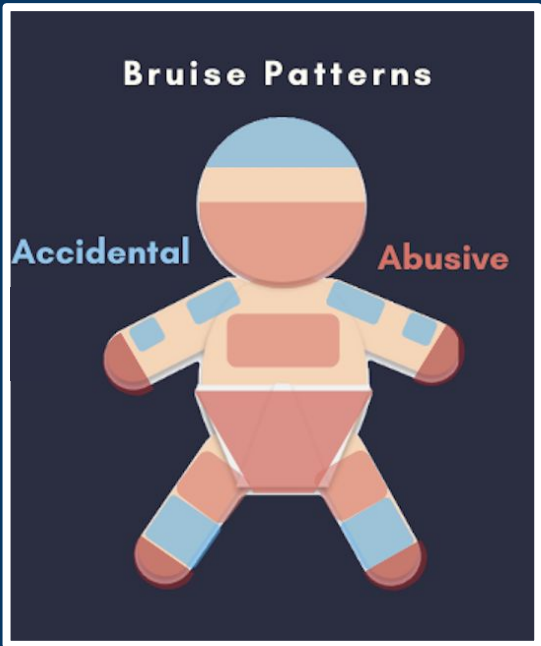


Articles:

- "The evaluation of suspected child physical abuse" Christian CW; Committee on Child Abuse and Neglect, American Academy of Pediatrics. Pediatrics. May 2015 May
- "Evaluating children with fractures for child physical abuse" Flaherty EG, Pediatrics. Feb 2014

Podcasts: Physical Abuse in Children

INJURIES SUGGESTIVE OF ABUSE



YOU CANNOT AGE A BRUISE

Be suspicious of:

- ➔ Any bruise in infants <6 mo or non-ambulating infant
- ➔ Bruising in unusual location in any age child
- ➔ Patterned bruising (loopmarks, hand print, imprint of object)

TEN-4-FACESp mnemonic for ***high risk*** for abuse:

TEN (torso, ear, neck) bruising

Any bruising in **<4** months **p**: Patterned bruising

Facial injury

- ➔ Unexplained torn frenulum in non-ambulating child
- ➔ Unexplained oral injury
- ➔ Unexplained ear injury
- ➔ Unexplained facial bruising in non-ambulating child

Head

- ➔ Subdural hematoma (+/- skull fracture)
- ➔ Unexplained Intracranial injury
- ➔ Subgaleal hematoma (due to hair pulling)

Lower suspicion if isolated linear skull fx with plausible mechanism in well appearing infant >6m

Eye

- ➔ Retinal hemorrhage
- ➔ Subconjunctival hemorrhage in infant (not birth injury)

Human Bite marks:

- ➔ Semi-circular/ oval patch +/- bruise

Burns

- ➔ Patterned contact burn with insufficiently explained mechanism
- ➔ Cigarette burn
- ➔ Stocking glove pattern
- ➔ Mirror image of burns in extremities
- ➔ Symmetric burns on buttocks
- ➔ Immersion burn
- ➔ Multiple burn sites
- ➔ Circumferential injuries

Fractures

High specificity:*

Metaphyseal chip fractures
Rib (posterior)
Scapular
Spinous process
Sternum

especially in infants

Moderate specificity:

Multiple Fx (especially bilateral)
Different ages
Epiphyseal separations
Vertebral body fractures/subluxations
Digital fractures
Complex skull fractures
Extremity fracture in infant <12 m/o

Low specificity:

Long bone shaft fractures in >12 m/o
Specific long bone shaft fractures in ambulating infants >9 mo:
-Distal buckle fracture of radius/ ulna
-Distal buckle fracture of tibia/ fibula
-Toddler's fracture (spiral tibial Fx)
Clavicular fractures in newborns, ambulatory medicine
Subperiosteal new bone formation

Source: https://www.chop.edu/clinical-pathway/abuse-physical-clinical-pathway

COMPONENTS OF EFFECTIVE TEAMS: TEAMSTEPPS IN A NUTSHELL

https://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/modules/implement/teamworknotes.html

COMMUNICATION

SBAR
Situation
Background
Assessment
Recommendation

CALL OUT
Sharing critical information with the team

CHECK BACK
Loop Closure**

HANDOFF
I PASS the BATON

Introduction

Patient
Assessment
Situation
Safety Concern

Background
Actions
Timing
Ownership
Next

Cognitive Aid @DrM_Kou

LEADERSHIP

BRIEF
Planning, setting the tone

HUDDLE
Ad-hoc planning or updates

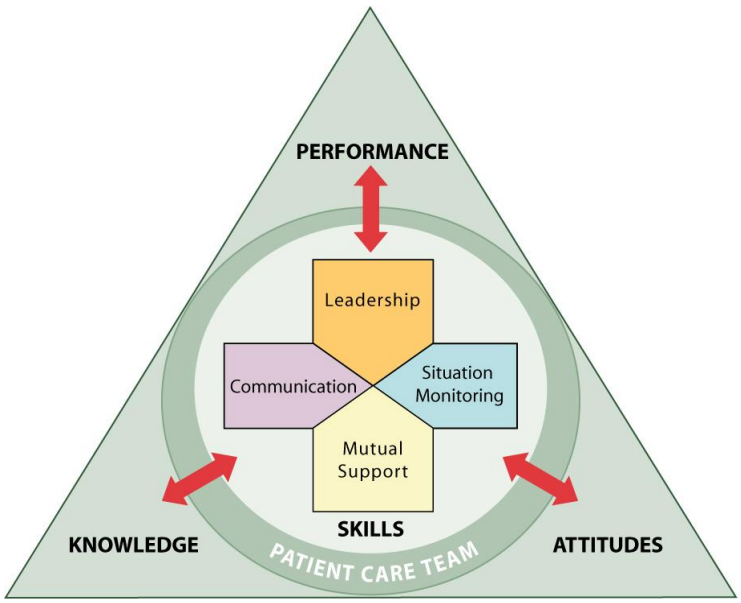
DEBRIEF
Exchange of information to inform team of performance and effectiveness

SITUATION MONITORING

STEP
Status of pt
Team Members
Environment
Progress toward goal

"I'M SAFE"
Tool for self evaluation
Illness
Medication

Stress
Alcohol/Drugs
Fatigue
Eating + Elimination



MUTUAL SUPPORT

TASK ASSISTANCE
Awareness of team work load

FEEDBACK
Providing information for purpose of team improvement

ADVOCACY & ASSERTION
Advocating for patient in case of a disagreement with decision maker

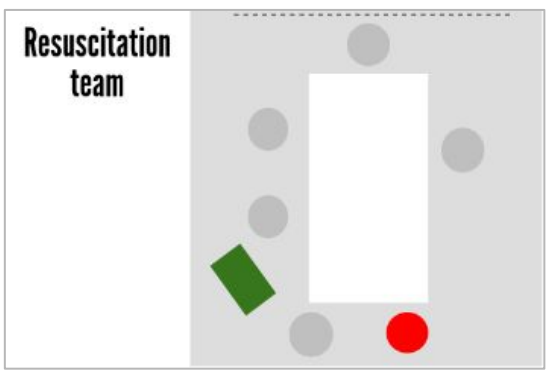
2 CHALLENGE RULE
Information conflict regarding patient safety

DESC Script
*Tool for personal conflict**
Describe situation
Express your concern
Suggest an alternative
Consensus statement

CUS STATEMENT
I'm concerned
I'm uncomfortable
This is a safety issue

COLLABORATION
Working toward a common mission

CRISIS RESOURCE MANAGEMENT: CRM and the Shared Mental Model:



CRM (established by the airline industry) is based upon team leadership and defining clear roles for team members. Closed loop communication when used by all team members reduces errors and improves safety through:

- Addressing team members by name when assigning tasks.
- Giving confirmation when tasks are acknowledged or completed.

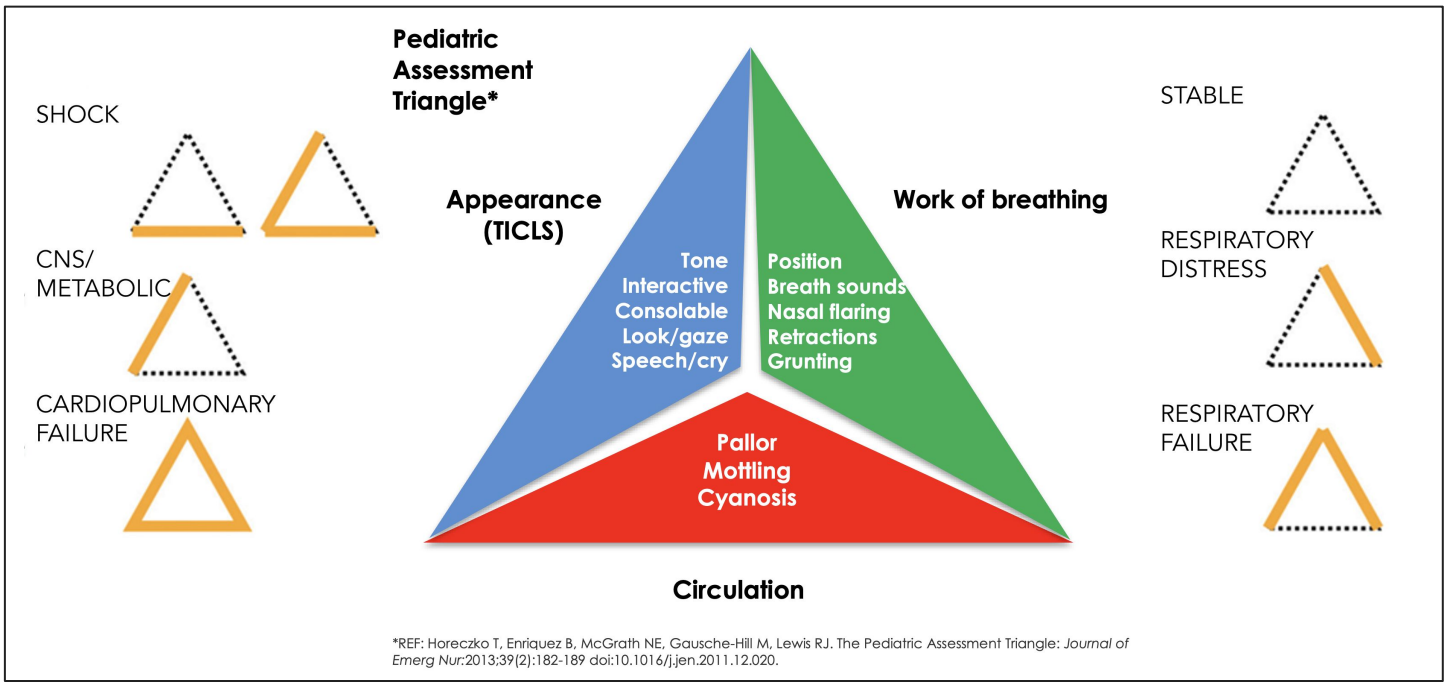
A shared mental model allows a team to anticipate the plan for patient care and what equipment or medications might be needed.

Pediatric Vital Signs/Weight by Age

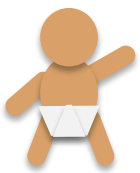
Age	Weight (kg)	Pulse	Resp	Systolic BP*
Newborn	3	100-180	30-60	60-70
6 mos	7	100-160	30-60	70-80
1 yr	10	100-140	24-40	72-107
2	12	80-130	24-40	74-110
3	15	80-130	24-40	76-113
4	16	80-120	22-34	78-115
5	18	80-120	22-34	80-116
6	20	70-110	18-30	82-117
8	25	70-110	18-30	86-120
10	35	60-100	16-24	90-123
12-15+	40-55	60-100	16-24	90-135

*BP in children is a late and unreliable indicator of shock

Using the Pediatric Assessment Triangle (PAT)



*REF: Horeczko T, Enriquez B, McGrath NE, Gausche-Hill M, Lewis RJ. The Pediatric Assessment Triangle: *Journal of Emerg Nur*:2013;39(2):182-189 doi:10.1016/j.jen.2011.12.020.



Pediatric Mental Status Assessment: response to stimuli

A	V	P	U
Alert	Verbal	Pain	Unresponsive

Family-centered care:

- Obtain appropriate history from family member (SAMPLE).
- Address family concerns and update on care.
- Manage the expectations of those who receive care in the ED and use communication methods that minimize the potential for stress, conflict, and misunderstanding [Assess via their communication to prep family for intubation and then for transfer, Patient Centered Communication (EM Milestone ICS1) Level 3:].

Medical knowledge:

- Verbalize the initial management of an acutely ill pediatric patient (ABC's).
- Verbalize first line diagnostic tests of child with suspected physical abuse.
- Demonstrate handoff of care at the end of the case .
- Integrate hospital support services into a management strategy for a problematic stabilization situation [Trainee should request transfer early, Emergency Stabilization (EM milestone PC1) Level 4], Performs rapid sequence intubation in patients using airway adjuncts Employs appropriate methods of mechanical ventilation based on specific patient physiology [Airway Management (EM milestone PC10) Level 3/Pediatric ACGME intubation procedure requirement].

Thank you for participating in the simulation.
Please complete the facilitator and participant surveys by clicking on the links or scanning the QR codes below:

Facilitator Survey

Participant Survey

Posted: Dec 2021
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