



A conference that is for us and by us

Big problems for small people: Pediatric emergencies for non- pediatric providers

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Relevant Financial Disclosure Relationship

Nothing to disclose.

Learning Objectives

1. Compare treatments for psychiatric emergencies in pediatric patients
2. Discuss the management of septic shock in pediatric patients
3. Describe the recognition and treatment of non-accidental trauma sequelae



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PSYCHIATRIC EMERGENCIES

* Compare treatments

Initial Considerations

- Why is this an emergency?
- Age of diagnosis
- Coping and communication skills
- Issues with previous medical management and/or services received
- Meet patients where they're at...

Assessment

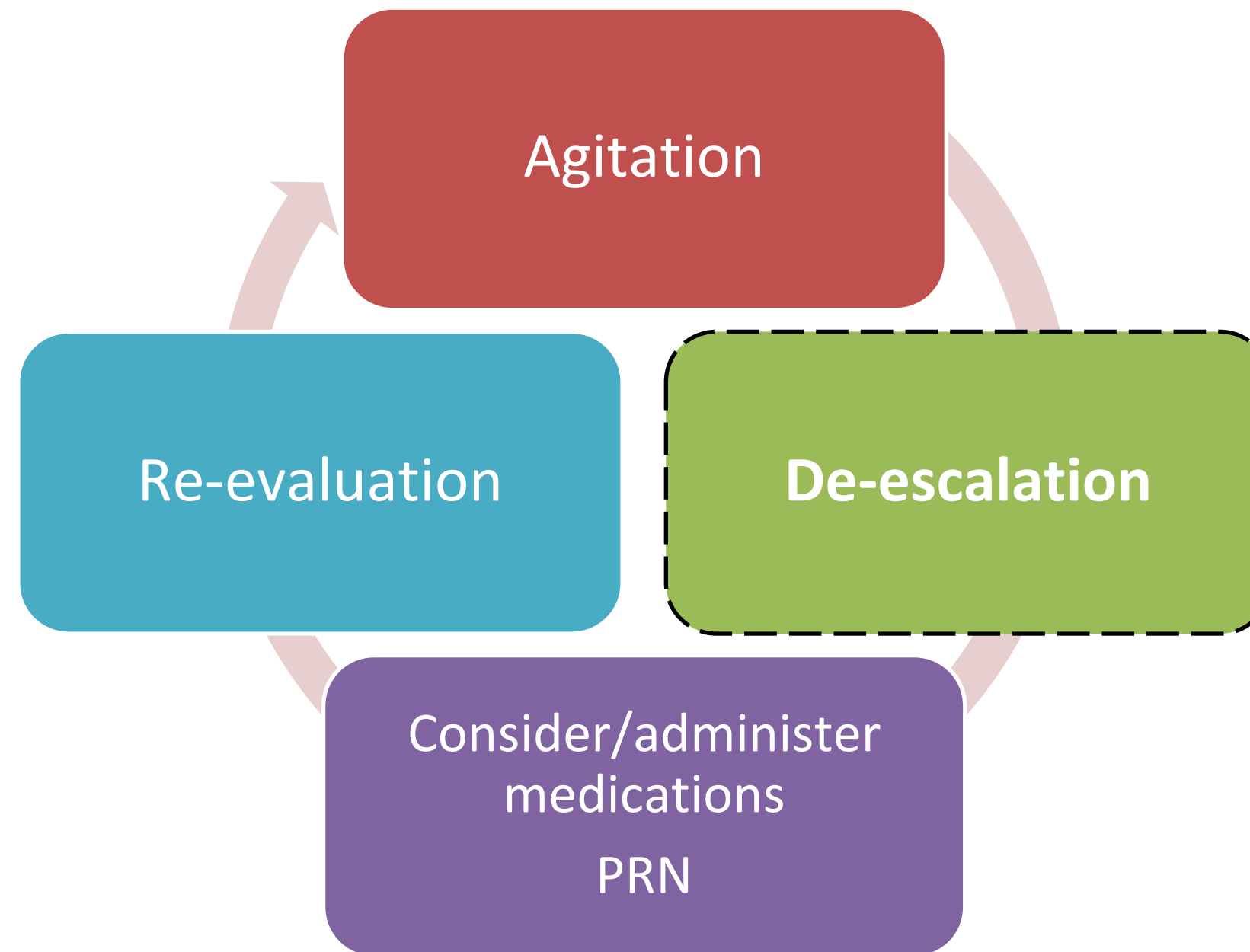
- Psychological
 - Acute psychosis
 - Agitation
 - Factitious
 - Suicidality, homicidality
- Physiological
 - Intracranial mass
- Infectious
 - Meningitis, neurosyphilis
 - PANDAS (pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections)
- Intoxicant
 - Intentional ingestion
 - Unintentional ingestion

Assessment

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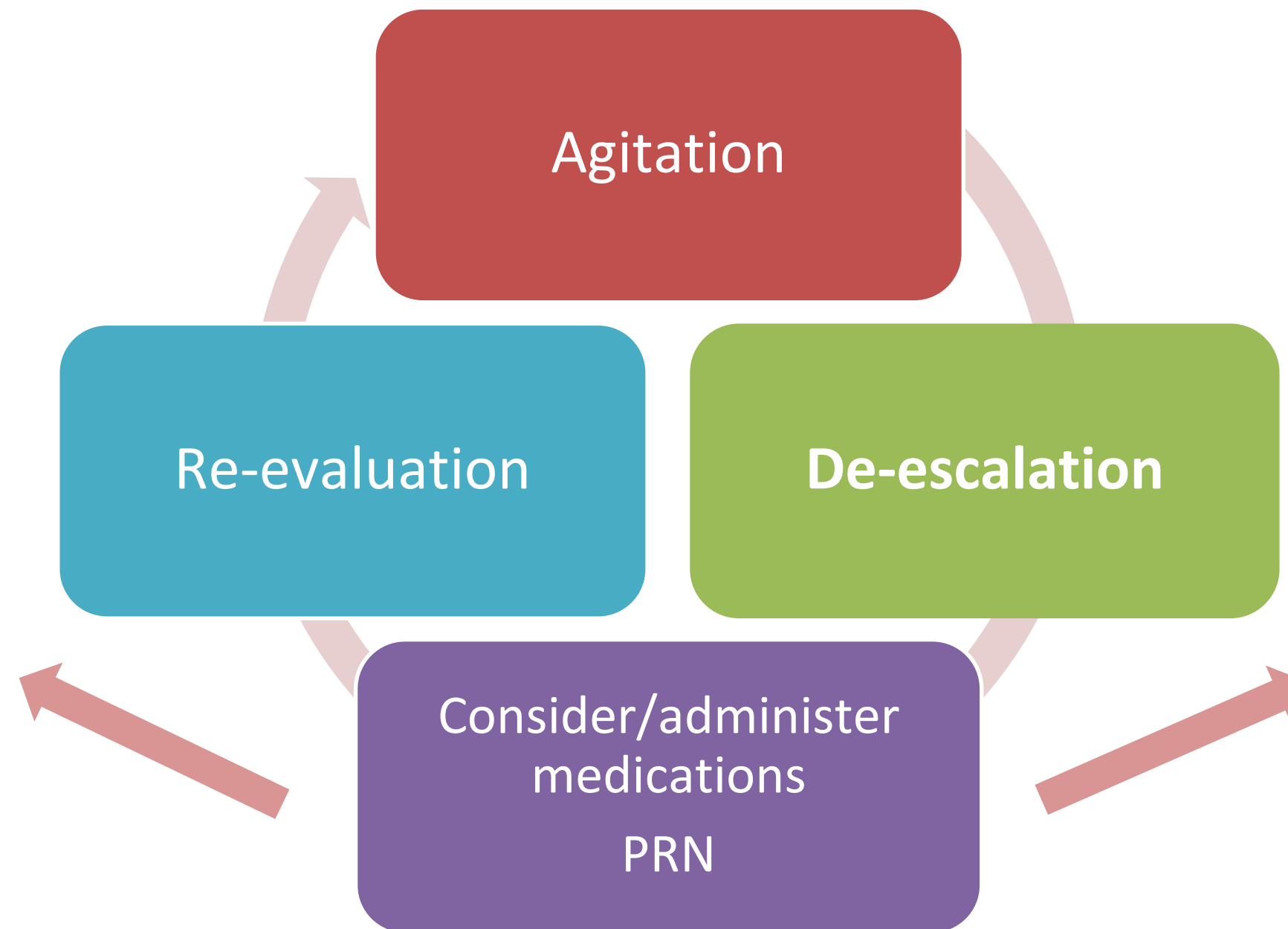
Managing Agitation

- First-line therapy is always de-escalation



Managing Agitation

- First-line therapy is always de-escalation



- Mild-moderate
 - Not a danger to self or others→ Oral

- Severe
 - IS a danger to self or others→ IV/IM

Medication Selection

Psychotic features

- First or second-generation antipsychotics (SGAs)
- Past medication failures/successes, home medications, symptom severity
- Sedate effects

Nonpsychotic mental distress

- Limited evidence for antipsychotic use in nonpsychotic illness; primarily used for calming
- Benzodiazepines as an alternative for agitation without psychotic features
- Consider SGAs in developmental delay, autistic features, or conduct disorder

Ingestion

- Benzodiazepines often preferred, excluding potential ingestion with alcohol or respiratory depressants
- Consider serotonergic, anticholinergic, and cardiovascular effects of antipsychotics

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antipsychotics

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⇐ +/- ⇒

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benzos

Antipsychotic Receptor Binding Affinities

Medication	Dopamine D ₂	Serotonin 5-HT _{2A}	Serotonin 5-HT _{1A}	Histamine H ₁	α ₁ -Adrenergic antagonism
Clozapine	+++	++++	+++	++++	+++
Haloperidol	++++	++	+	+	++
Risperidone	++++	+++++	++	++++	++++
Olanzapine	+++	++++	+	++++	++
Quetiapine	++	++	++	++++	++
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Adapted from *J Clin Psychiatry*. 2010;71(10):1391-1399.

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Comparative Kinetics

Medication	Time to onset
Olanzapine IM	10 - 30 min
Olanzapine ODT	15 - 45 min
Risperidone oral	30 - 60 min
Haloperidol IM	20 - 60 min
Haloperidol oral solution	50 - 60 min
Droperidol IM	10 - 30 min
Lorazepam IM	20 - 30 min
Lorazepam oral	30 - 60 min
Midazolam IM	10 - 30 min
Midazolam oral	15 - 30 min
"B-52"	15 - 30 min

Redosing...

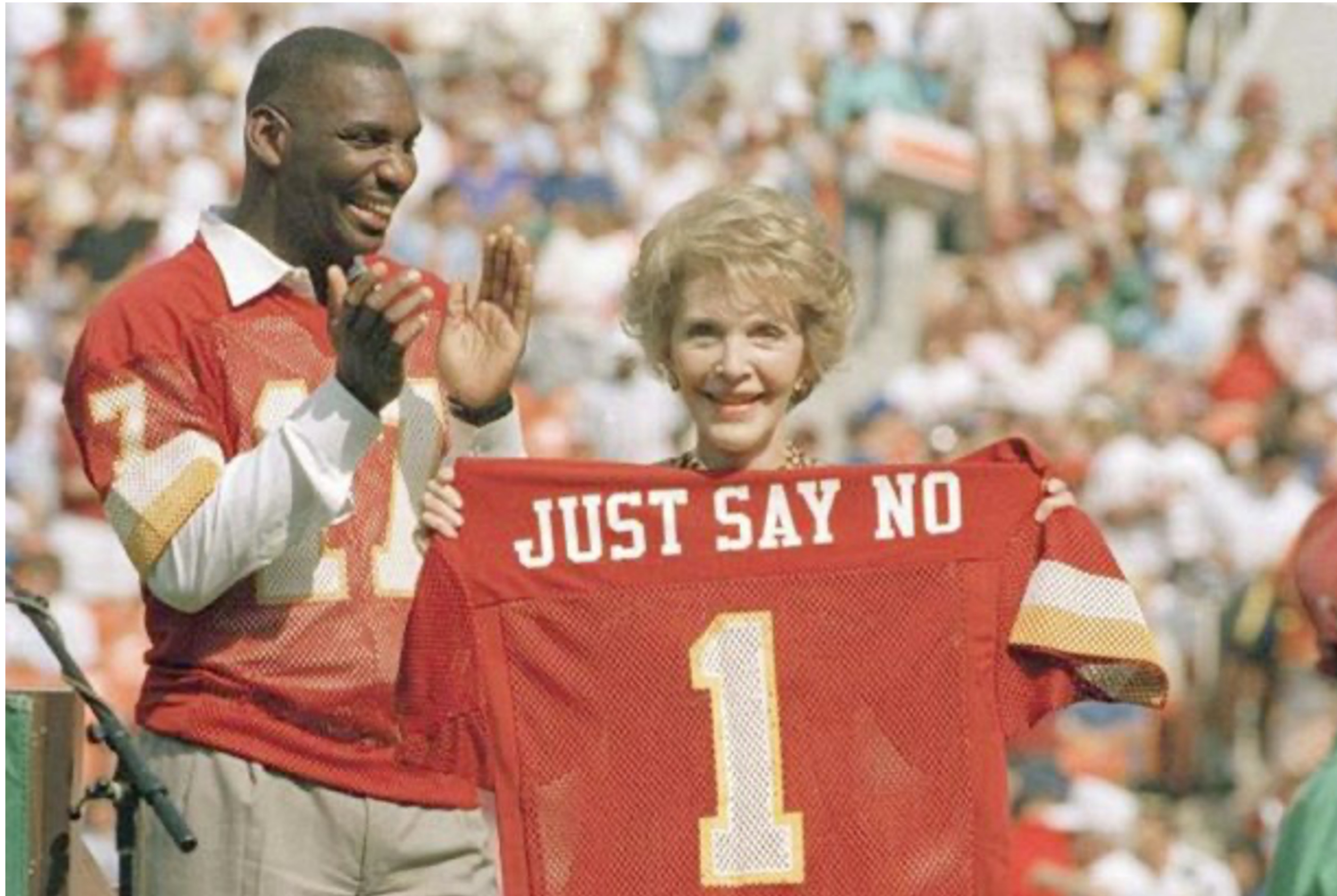
- Potential for additional doses or therapies
 - Olanzapine + benzodiazepine parenteral administration
 - Increased risk of sedation and/or respiratory depression
 - Package insert recommendation of dose separation by at least 1 hour
 - Oral dosing interaction may be less severe, but require longer separation of doses (delayed onset and peak)
 - Olanzapine repeat dosing
 - Repeat dosing more frequently than every 2 hours not studied

Comparative Efficacy

- Olanzapine IM, **olanzapine ODT**, and **risperidone oral solution** were as effective as *haloperidol IM* for the treatment of patients with acute agitation
 - Hsu WY, 2010
- **Olanzapine ODT** and **risperidone oral solution** yielded similar improvements in acutely agitated patients who accepted oral medication
 - Hatta K, 2008
- **IM olanzapine** and **IM midazolam** provided more effective sedation at 15 minutes than **IM haloperidol** or **IM ziprasidone** in acutely agitated ED patients; IM midazolam was possibly more effective than olanzapine
 - Klein LR, 2018
- **IM olanzapine** versus **IM droperidol** in acutely agitated ED patients? No difference in time to sedation or need for additional therapies
 - Cole JB, 2021
 - Klein LR, 2019

Other Agents

- Droperidol
 - A Systematic Review of the Effectiveness and Safety of Droperidol for Pediatric Agitation in Acute Care Settings. *Acad Emerg Med*. 2022 Dec;29(12):1466-1474.
 - Most experienced adequate sedation in under 15 minutes
 - 8-22% required additional medications
 - 2.5% (5/198) dystonia; 5% hypotension (5/103)
- Ketamine?



<https://www.prweek.com/article/1386405/nancy-reagans-memorable-just-say-no-moments>

Substance class	Examples	Preferred management
Cannabinoids - CB1 partial agonist	Cannabis, cannabidiol (not known to induce psychoactive symptoms)	-Abstinence particularly important following episodes of psychosis -Benzodiazepines (paranoia, psychosis)
Synthetic cannabinoids - CB1 full agonists	“K2”, “Spice”, “Kush”	-Benzodiazepines (paranoia, agitation, seizures)
Cocaine - Dopamine (DA) transporter blockade, serotonin (5-HT) and norepinephrine (NE) reuptake inhibition	n/a	-Benzodiazepines
Entactogens - Increased DA, 5-HT, NE; complex mechanisms	“MDMA”, “ecstasy”	-Antipsychotics -Anticonvulsants
Hallucinogens - 5-HT partial or full agonists	Mescaline, psilocybin, lysergic acid diethylamine (LSD), dimethyltryptamine (DMT)	-Benzodiazepines
Methamphetamine - Increased DA	n/a	-Benzodiazepines (paranoia, psychosis, agitation)
Phencyclidines and ketamine - NMDA antagonist, DA agonist	n/a	-Antipsychotics -Benzodiazepines

SEPTIC SHOCK

* Discuss management

Defining Pediatric Sepsis

- 2020 Surviving Sepsis Pediatric Guidelines (SSPG)
 - ≥ 37 weeks gestation to 18 years old
 - 1) Severe sepsis or septic shock as defined by the 2005 International Pediatric Sepsis Consensus Conference; OR
 - 2) Severe infection leading to life-threatening organ dysfunction

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- 2005 International Pediatric Sepsis Consensus Conference
 - Sepsis
 - ≥ 2 age-based (6 categories) SIRS (systemic inflammatory response syndrome) criteria, plus
 - Confirmed or suspected invasive infection
 - Severe sepsis
 - SIRS criteria, plus
 - Cardiovascular dysfunction, acute respiratory distress syndrome (ARDS), or ≥ 2 (non-cardiovascular) organ system dysfunctions
 - Septic shock
 - Severe infection leading to cardiovascular dysfunction, which includes hypotension, treatment with a vasoactive medication, or impaired perfusion

Pediatric SIRS Criteria

- ≥ 2 age-based SIRS criteria **one** of which must be abnormal temperature or leukocyte count

Table 3. Age-specific vital signs and laboratory variables (lower values for heart rate, leukocyte count, and systolic blood pressure are for the 5th and upper values for heart rate, respiration rate, or leukocyte count for the 95th percentile)

Age Group ^a	Heart Rate, Beats/Min ^{b,c}		Respiratory Rate, Breaths/Min ^d	Leukocyte Count, Leukocytes $\times 10^3/\text{mm}^3$ ^{b,c}	Systolic Blood Pressure, mm Hg ^{b,c,e,f}
	Tachycardia	Bradycardia			
0 days to 1 wk	>180	<100	>50	>34	<65
1 wk to 1 mo	>180	<100	>40	>19.5 or <5	<75
1 mo to 1 yr	>180	<90	>34	>17.5 or <5	<100
2–5 yrs	>140	NA	>22	>15.5 or <6	<94
6–12 yrs	>130	NA	>18	>13.5 or <4.5	<105
13 to <18 yrs	>110	NA	>14	>11 or <4.5	<117

Table 4. Organ dysfunction criteria

Cardiovascular dysfunction

Despite administration of isotonic intravenous fluid bolus ≥ 40 mL/kg in 1 hr

- Decrease in BP (hypotension) < 5 th percentile for age or systolic BP < 2 SD below normal for age^a

OR

- Need for vasoactive drug to maintain BP in normal range (dopamine > 5 μ g/kg/min or dobutamine, epinephrine, or norepinephrine at any dose)

OR

- Two of the following

Unexplained metabolic acidosis: base deficit > 5.0 mEq/L

Increased arterial lactate > 2 times upper limit of normal

Oliguria: urine output < 0.5 mL/kg/hr

Prolonged capillary refill: > 5 secs

Core to peripheral temperature gap $> 3^{\circ}\text{C}$

Respiratory^b

- $\text{PaO}_2/\text{FIO}_2 < 300$ in absence of cyanotic heart disease or preexisting lung disease

OR

- $\text{Paco}_2 > 65$ torr or 20 mm Hg over baseline Paco_2

OR

- Proven need^c or $> 50\%$ FIO_2 to maintain saturation $\geq 92\%$

OR

- Need for nonelective invasive or noninvasive mechanical ventilation^d

Neurologic

- Glasgow Coma Score ≤ 11 (57)

OR

- Acute change in mental status with a decrease in Glasgow Coma Score ≥ 3 points from abnormal baseline

Hematologic

- Platelet count $< 80,000/\text{mm}^3$ or a decline of 50% in platelet count from highest value recorded over the past 3 days (for chronic hematology/oncology patients)

OR

- International normalized ratio > 2

Renal

- Serum creatinine ≥ 2 times upper limit of normal for age or 2-fold increase in baseline creatinine

Hepatic

- Total bilirubin ≥ 4 mg/dL (not applicable for newborn)

OR

- ALT 2 times upper limit of normal for age

Table 4. Organ dysfunction criteria

Cardiovascular dysfunction

- Despite administration of isotonic intravenous fluid bolus ≥ 40 mL/kg in 1 hr
- Decrease in BP (hypotension) < 5 th percentile for age or systolic BP < 2 SD below normal for age^a
- OR
- Need for vasoactive drug to maintain BP in normal range (dopamine > 5 μ g/kg/min or dobutamine, epinephrine, or norepinephrine at any dose)
- OR

- Two of the following:
 - Unexplained metabolic acidosis
 - Increased arterial lactate
 - Oliguria: urine output < 1 mL/kg/hr
 - Prolonged capillary refill
 - Core to peripheral temperature gradient $> 3^{\circ}\text{C}$

Respiratory^b

- $\text{PaO}_2/\text{FiO}_2 < 300$
- $\text{Paco}_2 > 65$ torr
- Proven need^c for mechanical ventilation
- Need for noninvasive respiratory support

Neurologic

- Glasgow Coma Scale ≤ 8
- Acute change in mental status

Hematologic

- Platelet count $< 100,000/\text{mm}^3$
- Abnormal coagulation studies (prothrombin time, partial thromboplastin time, or fibrinogen level) without heparin therapy

- International normalized ratio > 1.5

Renal

- Serum creatinine ≥ 2 times upper limit of normal for age or 2-fold increase in baseline creatinine

Hepatic

- Total bilirubin ≥ 4 mg/dL (not applicable for newborn)
- ALT 2 times upper limit of normal for age

OR



Common Causes of Pediatric Sepsis

- Neutropenic fever, meningitis, bacteremia, pneumonia, pyelonephritis, appendicitis, skin and soft tissue
- Pneumonia
 - Most common cause of pediatric sepsis
 - Viruses are the primary cause of pediatric pneumonia; may progress to sepsis (e.g. respiratory syncytial virus, influenza, coronavirus, rhinovirus)
 - Atypical more common among ages 5-13 years old
- Pathogens of pediatric neutropenia are similar; broaden
- Higher meningitis suspicion in infants, toddlers, adolescents
- Appendicitis

"TICLS"

Appearance

Abnormal Tone
↓ Interactiveness
↓ Consolability
Abnormal Look/Gaze
Abnormal Speech/Cry

Work of Breathing

Abnormal Sounds
Abnormal Position
Retractions
Flaring
Apnea/Gasping

→ grunting, stridor
→ tripoding, head bobbing

Circulation to Skin

Pallor
Mottling
Cyanosis

Pediatric Hypotension

- PALS (Pediatric Advanced Life Support) definitions

	Neonate	Infant	1-10 years	≥11 years
SBP (mmHg)	< 60	<70	< 70 + (2x age in years)	< 90

- Surviving Sepsis Guideline definitions

	Infants	1-5 years	>5 years
SBP (mmHg)	<50	< 60	< 70

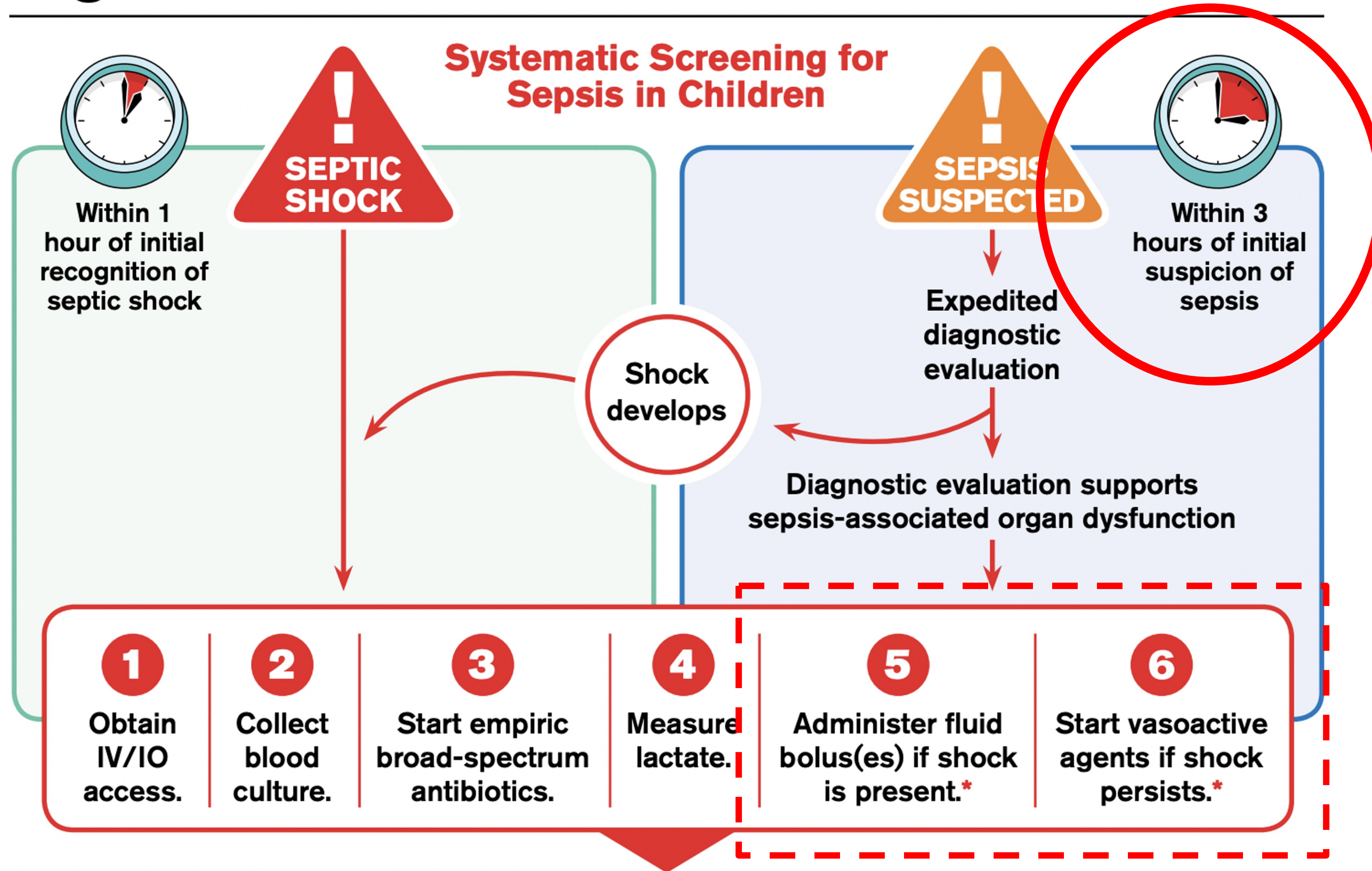
Any age
Cold extremities, capillary refill >3 sec, weak/fast pulse

Pediatric Hypotension

- “Warm” and “cold” shock
 - Historically important to understand terminology
 - 2020 SSPG: We suggest not using bedside clinical signs in isolation to categorize septic shock in children as “warm” or “cold”
 - Weak recommendation, very low quality of evidence
 - Observational studies have demonstrated **very poor correlation of clinical assessments with cardiac index and systemic vascular resistance** as measured by advanced monitoring techniques
 - Categorical distinction may be helpful if advanced hemodynamic monitoring is available to assess patient physiology more accurately

Initial Resuscitation Algorithm for Children

Surviving Sepsis
Campaign®



Fluid Resuscitation

- 2020 SSG differentiate ICU and non-ICU healthcare facilities
 - Judicious utilization of fluids to reduce incidence of volume overload, particularly in the absence of intensive care services
- In summary,
 - No ICU & no hypotension
 - Bolus only with evident & ongoing dehydration
 - Otherwise...
 - 10-20 mL/kg fluids, repeat 2-3 times
 - Consider vasopressors when non-responsive or signs of fluid overload
 - ICU availability
 - OK to bolus up to 60 mL/kg
 - OK to bolus for abnormal perfusion without hypotension
- Ideal body weight

Vasopressor Selection

- We suggest using **epinephrine**, rather than dopamine, in children with septic shock (*weak recommendation, low quality of evidence*)
 - Reduced mortality and increase in organ failure-free days by day 28
 - May be preferred for reduced myocardial dysfunction and cardiac output
- We suggest using **norepinephrine**, rather than dopamine, in children with septic shock (*weak recommendation, very low quality of evidence*)
 - May be preferred for reduced systemic vascular resistance

epinephrine $\approx$ norepinephrine > ~~dopamine~~

Vasopressor Selection

- We suggest either adding **vasopressin** or further **titrating catecholamines** in children... who require high-dose catecholamines (*weak recommendation, low quality of evidence*)

→ **Administration:** do not delay to await central venous access; best peripheral access while gaining central

THE MISFITS: Differential in Sick Infants



- Trauma
- Heart disease, hypovolemia → O_2
- Endocrine emergencies
- Metabolic → electrolytes
- Inborn errors of metabolism → NH_3 , glucose, ketones, lactate
- Seizures → bicycling
- Formula feeding problems
- Intestinal disorders → AXR
- Toxins
- ...Sepsis!

Neonatal Sepsis

- Early vs. late onset sepsis
 - EOS: definition varies from at or before 72 hours to 7 days
 - Preterm birth and low birth weight greatest risk factor
 - Maternal Group B Streptococcus colonization, rupture of membranes >18 hours, and maternal signs or symptoms of intra-amniotic infection
 - LOS: greater than 72 hours (or 7 days) of life; very low birth weight (VLBW) infants at greatest risk

Additional Neonatal Sepsis Risk Factors	
• Prematurity, low gestational age • Low birth weight • Immature immunity • Prolonged hospital stay • Mechanical ventilation • Central venous catheters • Lack of enteral feeding	• ROM > 18 hours • Maternal GBS colonization • Maternal intra-amniotic infection • Maternal fever • Vaginal birth

Neonatal Sepsis

- Stabilization
- *Some* diagnostic considerations
 - Signs are generally non-specific 😊
 - No UA
 - To LP or not to LP?!
 - WBC unhelpful in EOS

Neonatal Sepsis

- EOS - **Group B Streptococcus**, E. coli, ?Listeria monocytogenes?
 - Up to 70% of listeria infections in neonates are in infants delivered at <35 weeks of gestation
 - Antibiotics
 - Ampicillin + aminoglycoside (synergistic activity against GBS and Listeria)
 - 3rd generation cephalosporin
 - +/- acyclovir (HSV transmission)

Neonatal Sepsis

- LOS – Coagulase negative S. aureus, Enterobacteriaceae (E.coli and Klebsiella), S. aureus, Candidiasis
 - Antibiotics
 - Ampicillin [or vancomycin] + aminoglycosides [or 3rd+ generation cephalosporin]
 - +/- carbapenem
 - +/- acyclovir, fluconazole

NON-ACCIDENTAL TRAUMA

- * Describe recognition and treatment

Background

- “Non-accidental trauma” (NAT)= purposefully inflicted actions towards a child resulting in injury (physical, emotional, sexual, neglectful)
- Why is this an emergency?
 - Homicide is the 3rd leading cause of death in children 1-9 years old
 - Escalating severity
- Risk Factors
 - No age, ethnicity, or socioeconomic status is exempt!
 - Parental, child related, and/or environmental
- Multiple predisposing physiological differences
 - Immature skull, incomplete ossification, poorly developed musculature, etc.

Recognition

- A concerning history...
 - Absence of one
 - Delays in care
 - Inconsistent with injury or child's developmental abilities
- Physical exam
 - General indicators of neglect; overall appearance, behavior, development
 - Neurologic exam (**Pediatric Glasgow Coma Scale**)
 - Oral; dentition (caries), frenulum injuries
 - Abdominal exam
 - Range of motion (fracture, unhealed injuries with limitations)
 - Thorough skin examination (bruising may be limited to less visible areas) and scalp palpation

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- Uninterrupted interview; open-ended questions
- Inquire specifically about injury mechanism
- History from multiple sources; individual interviews preferred
- Child interview when possible: “unknown” or “self-inflicted” are concerning; inquire about sexual assault—completed or guided by experts

Suspected NAT...

Urine studies	Renal injuries, drug exposure
Blood tests	Abnormal elevations concerning for internal injuries (AST/ALT elevations) and ruling in/out other explanatory diagnoses
Skeletal survey	Healing or acute fracture evaluation; particularly in children $\leq$ 24 months
Targeted x-rays	Children >24 months with areas of pain or abnormal findings
Computed tomography (CT)	Cranial: suspected head and neck trauma; potentially abused children <6 months; (Consider <u>PECARN Pediatric Head Injury Algorithm</u> guidance to identify “Clinically-important traumatic brain injury”) → Consider follow-up MRI for identified injuries Abdominal: when screening labs are elevated
Dilated eye examination	Retinal hemorrhages; Recommended when neuroimaging abnormalities present, not routine

Medical Complications

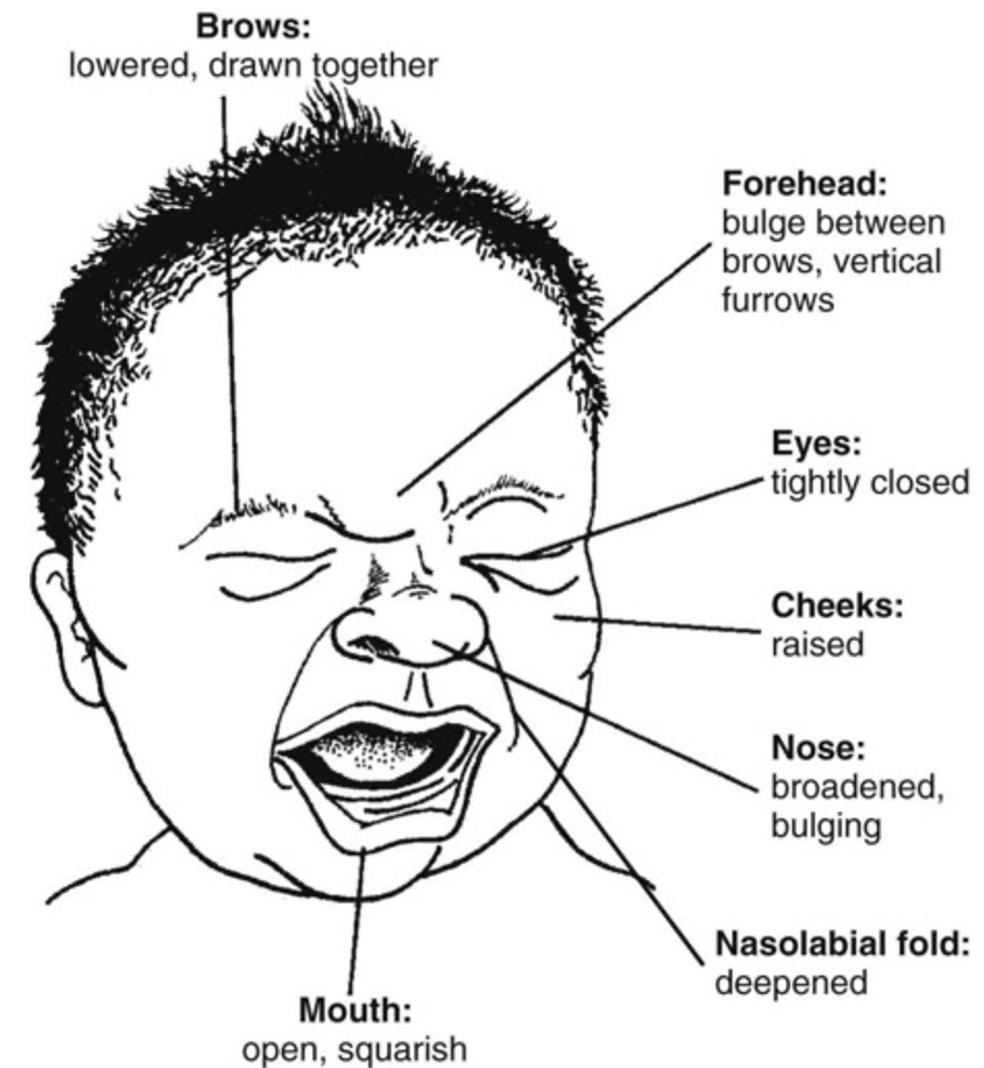
- Traumatic brain injury
 - Subdural hematoma, subarachnoid hemorrhage, cerebral edema
- Retinal hemorrhage
 - 70%-85% of head injuries
 - Acceleration-deceleration trauma; “shaken baby syndrome”
- Fractures
- Burns
 - “Immersion” and circumferential burns (hands, feet; buttock, genitalia), small circumferential suggestive of cigarette or similar, burns with object shape
- Cardiopulmonary arrest
 - Primarily non-shockable rhythms

Pediatric Considerations

- Traumatic brain injury
 - Hypertonic saline > mannitol
 - Other considerations apply as with adults
- Fractures
 - Antibiotics per EAST or IDSA guidelines; minimal difference from adult
 - CDC Guidelines for tetanus immunization
- Burns
 - Know when to transfer
 - Procedural sedation, pain management, follow-up referral
- Cardiopulmonary arrest
 - Primarily non-shockable rhythms

Acute Pediatric Pain

- Separating pain from anxiety
- ED assessment tools
 - Observational
 - Nursing Assessment of Pain Intensity (NAPI) [newborn-16 yo]
 - Revised Face, Leg, Activity, Cry, Consolability (r-FLACC) [2-7 yo]
 - Self-reported
 - Wong-Baker FACES Pain Scale [3-16 yo]
 - Horizontal Numeric Pain Rating Scale (NPRS) [4-16 yo]
 - Verbal Numeric Scale [6-18+ yo]



Wong-Baker FACES® Pain Rating Scale



Acute Pediatric Pain

- No universally accepted acute pediatric pain management guideline
- Routes of administration
 - Often a determinant in therapeutic selection in pediatric ED patients because vascular access may not be immediately available
 - Consider intranasal, intramuscular, rectal options
 - **Intranasal:** fentanyl, ketamine
 - **Intramuscular:** fentanyl, ketamine, *morphine?*
 - **Rectal:** acetaminophen

Intranasal Use in Pediatric Trauma

- PITCHFORK (Pain in Children Fentanyl or Ketamine) trial: a randomized controlled trial comparing intranasal ketamine and fentanyl for the relief of moderate to severe pain in children with limb injuries
 - Fentanyl 1.5 mcg/kg vs. ketamine 1 mg/kg
 - Isolated limb injury + pain score >6/10 (NPRS)
 - Similar pain reductions; more mild adverse effects from ketamine
- A randomized controlled trial comparing intranasal fentanyl with intravenous morphine for managing acute pain in children in the emergency department
 - Intranasal fentanyl 1.7 mcg/kg vs. IV morphine 0.1 mg/kg
 - Patients 7-15 years of age with long bone fracture
 - Shown to be equally efficacious

NAT Final Thoughts...

- Phone a friend(ly local pediatrician or children's ED)
- Mandated reporters (suspicion=report)
- Requires a multidisciplinary approach
- Can be traumatizing to observe/manage
- Debrief

Learning Assessment Question

1. TJ is a 12-year-old male who presents to your emergency department under law enforcement custody for a psychiatric evaluation after reported public disturbance. Per law enforcement, he has been non-compliant with their requests. The officers are frustrated with his attitude and ask you to hurry up and do something. He is verbally escalated and notably agitated upon arrival but redirectable and without violent movements. Which of the following is the least appropriate next step?
 - a. Administer an intramuscular medication for agitation
 - b. Attempt an alternative de-escalation technique
 - c. Offer the patient an oral medication for agitation

Learning Assessment Question

Answer: A. Administer an intramuscular medication for agitation

Explanation: A. Administer an intramuscular medication for agitation

TJ is a 12-year-old male who is under law enforcement custody and presents to the emergency department for a psychiatric evaluation. Although he is verbally escalated and agitated, he is redirectable and not displaying violent movements. In this case, it's important to prioritize non-invasive, non-pharmacological approaches before resorting to more aggressive interventions.

b. Attempt an alternative de-escalation technique: This is an appropriate next step to consider, as it prioritizes non-pharmacological interventions and attempts to calm the patient without resorting to medications.

c. Offer the patient an oral medication for agitation: This option is more appropriate than administering an intramuscular medication because it is less invasive and allows the patient to have more control over the situation. However, it is still less preferable than attempting alternative de-escalation techniques

Learning Assessment Question

2. According to the 2020 Pediatric Surviving Sepsis Guidelines, which of the following is correct?

- a. Patients should receive 70 mL/kg of crystalloid fluids before vasopressors are initiated in septic shock
- b. Broad-spectrum antibiotics may be administered within 3 hours of initial suspicion of sepsis in the absence of shock
- c. Age-based hypotension must be present to meet diagnostic criteria for sepsis
- d. Dopamine is the vasopressor of choice in septic shock

Learning Assessment Question

2. According to the 2020 Pediatric Surviving Sepsis Guidelines, which of the following is correct?

Answer: b. Broad-spectrum antibiotics may be administered within 3 hours of initial suspicion of sepsis in the absence of shock

Explanation: According to the 2020 Pediatric Surviving Sepsis Guidelines, the correct statement is (b) Broad-spectrum antibiotics may be administered within 3 hours of initial suspicion of sepsis in the absence of shock. The guidelines recommend an initial fluid bolus of 10-20 mL/kg repeated 2-3 times, not 70 mL/kg, before vasopressors are initiated in septic shock. The presence of hypotension is not required to meet pediatric sepsis criteria; however, either an abnormal leukocyte count or abnormal temperature must be present to meet diagnostic criteria. Lastly, norepinephrine or epinephrine, not dopamine, are the first-line vasopressors in pediatric septic shock.

Learning Assessment Question

3. In the assessment and management of acute pediatric pain where suspected non-accidental trauma is on the differential diagnosis, which of the following is correct?
- a. Self-reported pain scales should be reserved for evaluating patients who are at least 2 years of age or older
 - b. The Pediatric Emergency Care Applied Research Network (PECARN) pediatric head injury algorithm helps determine the likelihood of a clinically-important traumatic brain injury and indication to pursue computed tomography imaging
 - c. A full physical exam is not recommended in verbal pediatric patients who do not report pain
 - d. Intranasal fentanyl has proven efficacy in the management of moderate to severe pain in pediatrics

Learning Assessment Question

3. In the assessment and management of acute pediatric pain where suspected non-accidental trauma is on the differential diagnosis, which of the following is correct?

- a. Self-reported pain scales should be reserved for evaluating patients who are at least 3 years of age or older
- b. The Pediatric Emergency Care Applied Research Network (PECARN) pediatric head injury algorithm helps determine the likelihood of a clinically-important traumatic brain injury and indication to pursue computed tomography imaging
- c. A full physical exam is not recommended in verbal pediatric patients who do not report pain
- d. Intranasal fentanyl has proven efficacy in the management of moderate to severe pain in pediatrics

Explanation: In the assessment and management of acute pediatric pain where suspected non-accidental trauma is on the differential diagnosis, statements (a), (b), and (d) are correct, while (c) is incorrect. (a) Self-reported pain scales are preferred to evaluate patients at least 3 years of age and older, as it allows patients to express their own pain experience. (b) The PECARN pediatric head injury algorithm is a validated tool to help identify the risk of a clinical-important traumatic brain injury, and guides the appropriate use of further computed tomography based on this (c) A full physical exam is still recommended in verbal pediatric patients who do not report pain, as it can help identify injuries or signs of trauma that the child may not be able to describe or express. (d) Intranasal fentanyl has proven efficacy in managing moderate to severe pain in pediatrics, offering a non-invasive and effective option for pain management.



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Questions?

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