

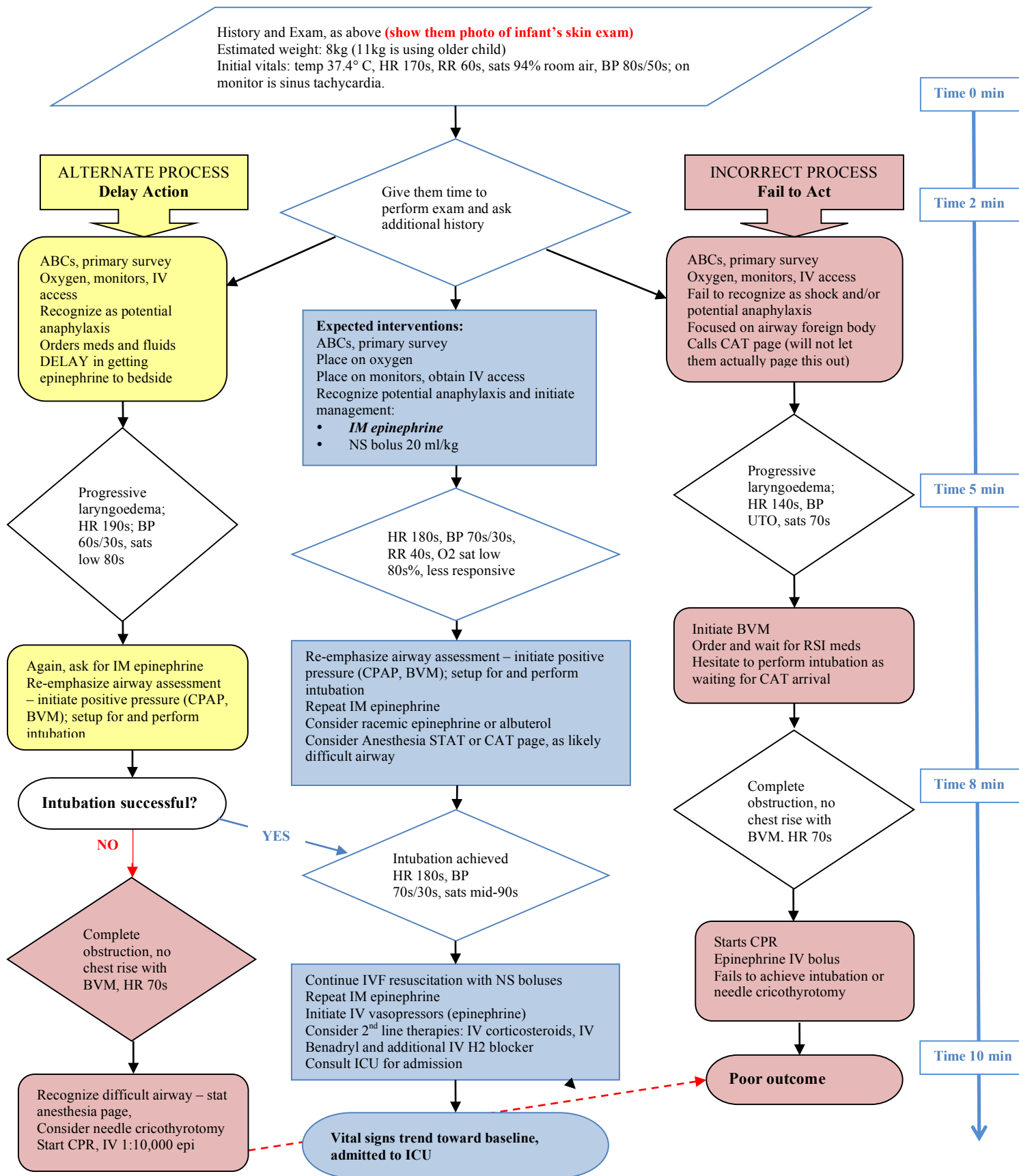
<p>Goals and objectives Technical and non-technical</p> <h2 style="margin-top: 20px;">Anaphylaxis</h2>	<p>The focus of this simulation is around:</p> <ol style="list-style-type: none"> 1. Recognition of anaphylaxis, including differential diagnosis 2. Proper ABCs and airway management, as intubation may be required, including RSI medications, timing of attempt, etc. 3. Access, including need for IO 4. Use of IM epinephrine, specifically 1:10,000 for weight under 10kg; epi pen jr for weight 10kg-25kg; and epi pen for weights > 25 kg 5. Awareness of and compliance with new Anaphylaxis algorithm <p>The focus of debriefing will be:</p> <ol style="list-style-type: none"> 1. Performance during simulation, specifically diagnostic approach 2. Teamwork and communication, specifically IDC of medications at medication counter 3. If recognizes anaphylaxis, then pointed discussion of management in the ED, i.e. goals for resuscitation, timing and selection of medications <ol style="list-style-type: none"> a. Use of anaphylaxis algorithm b. Differences in IM epinephrine concentration and formulations depending on age (<10kg, 10-25 kg, >25 kg)
<p>Target participants (roles, specialty)</p>	<p>Emergency Department Personal, with potential consultation of allergy and critical care</p>
<p>Clinical setting (ED, OR, patient room) sim lab or in situ</p>	<p>Shock Trauma Suite</p>
<p>Basic scenario information (outline)</p>	<p>History: Your patient is a 7-month old male (or 15-months if the sim is for the older child with a larger weight), brought by EMS from a home daycare for difficulty breathing. He was having a snack and developed respiratory distress, which seems progressively worse over past few minutes. No choking episode was witnessed. EMS was called and the patient transported to the medical center with oxygen. Accompanied by daycare worker, with parents on the way.</p> <p>Further history, if asked: No reported medical problems, medications or allergies per daycare worker. Was fine early in the day – no fever, cough, vomiting, recent illnesses, known sick contacts, etc. While eating the snack, which consistent of cheerios and peanut butter cookie, the infant developed fussiness, red rash around his mouth and hoarse cry with “noisy high-pitched breathing” and associated intermittent cough. He has vomited once since then. No apnea, no cyanosis noted.</p> <p>Exam: Estimated weight: 8kg (if 15-month old, then use 11kg) Initial vitals: temp 37.4° C, HR 170s, RR 60s, sats 94% room air, BP 80s/50s; on monitor is sinus tachycardia.</p> <p>What simulator shows: <i>Eyes closed</i>, pupils symmetric and normal size, increased respiratory effort, weak intermittent hoarse cry and intermittent stridor, lung fields with clear breath sounds, normal heart sounds, intact central pulses, weak distal pulses; Skin: diffuse hives (see picture)</p> <p>What facilitator tells them, only if asked: Appearance: anxious, obvious respiratory distress Pupils reactivity: normal HEENT exam: hives around his mouth with moderate lip and mild tongue swelling, otherwise normal, neck without nuchal rigidity, full passive range of motion Abdomen: soft, non-tender, non-distended, no organomegally Extr: full range of motion, no joint effusions or tenderness Perfusion: cool feet and hands, delayed cap refill at 4 seconds Neuro: opens eyes to physical stimuli, cries and pulls away with IV stick/physical stimuli</p>
<p>Simulator to be used</p>	<p>Infant Laerdal</p>
<p>Fluids and medications</p>	<p><u>1st-line therapies:</u></p> <ul style="list-style-type: none"> • Epinephrine (1:1,000) IM: <ul style="list-style-type: none"> ○ Given inability to pull up very small doses of 1:1000 under 10 kg, team will need to follow code book and use 1:10,000 IM for infants under 10 kg ○ Due to recent change in STS, will use EpiPen or EpiPen Jr. for kids over 10 kg • Oxygen • Normal Saline fluid boluses (20 mL/kg aliquots) <p><u>2nd-line therapies:</u></p>

	<ul style="list-style-type: none"> • Corticosteroids: solumedrol, dexamethasone, prednisone • Benadryl IV (preferred over PO) • Second tier antihistamines: Zantac, Tagamet, Pepcid <p><u>Adjunctive therapies:</u></p> <ul style="list-style-type: none"> • Albuterol nebulized and/or racemic epinephrine • Glucagon for refractory anaphylaxis (or patients on beta-blocker therapy) • Atropine for refractory bradycardia • Inotropes/Chronotropes/Vasopressors, if required: dopamine, epinephrine, norepinephrine <p><u>RSI medications:</u></p> <ul style="list-style-type: none"> • See below in airway intervention
Equipment needed (IV's, ET tubes, Chest tubes,)	<p>PPE B/P cuff, monitor leads, pulse oximetry B-Board IV/IO supplies IV pump, syringe pump(s) Monitors Airway equipment: nasal cannula, simple face mask, NRB setup, BVM setup, ETT tubes, laryngoscope and blades, stylets, suction ETCO2 detector/monitor</p>
Paperwork, labs, X rays and EKG's, photos, videos	Picture on laptop (or printed, laminated photo) of diffuse urticaria
Medication intervention	See above; refer to algorithm for timing of intervention(s)
Airway intervention (oxygen, BVM, intubation)	<p>Initial Non-Rebreather mask for increase oxygen demands Anticipate need for assisted ventilation – CPAP, BiPAP, BVM Anticipate need for advanced airway - appropriate sized blade/ETT Appropriate RSI medication selection:</p> <ul style="list-style-type: none"> • Pre-meds: atropine likely required given age (for 7-month old), no indication for lidocaine • Sedative: Etomidate or ketamine appropriate; fentanyl would be next choice, but need to use higher dosing (3-5 mcg/kg); avoid benzos and barbiturates as will potentiate hypotension • Neuromuscular blockade: Succinylcholine or rocuronium appropriate
Physiologic intervention (CPR)	<p>Recognition of shock state, most likely due to anaphylaxis: ill appearance, decreased mental status, tachycardia, borderline systolic blood pressures with wide pulse pressure, poor distal perfusion</p> <p>Aggressive use of epinephrine and IVFs to resuscitate shock state, while watching for potential side effects/progression that include:</p> <ul style="list-style-type: none"> • Respiratory Failure - Assisted Ventilation and Oxygenation • Circulatory Collapse – IVF resuscitation, resusc meds and CPR <p>If note responsive to fluids, then early use of pressors, even with peripheral IV access</p>
Procedures and other interventions	<p>Requires IV access – initially PIV; IO if cannot get (or do not give them) PIV or if goes into arrest and no access present. Infuse 20ml/kg Normal Saline by rapid infuser or rapid push-pull method.</p> <p>Intubation: see above</p>
Number of and education of instructors	<p>1-2 Education Specialist 2 facilitator (1 RN, 1 MD)</p>
Evaluation tools and measurement points	<p>Will record latent safety threats and team-level knowledge deficits Did the team access the new anaphylaxis algorithm? Did they assess whether patient belonged on algorithm? Was epinephrine the first medication given? Was epinephrine given correctly (IM, right dose for weight, etc.)? Teaching points:</p> <ul style="list-style-type: none"> • IM Epi is the most important medication, all others are secondary. • After IM Epi ordered, getting access for NS bolus is second priority, for further potential BP support. • Emphasize repeat IM Epi if no improvement or if progression of symptoms. • No labs needed initially; serum tryptase can be helpful in diagnosis during later evaluation, need to draw approx. 2h after initial symptoms. • Signs/symptoms may be subtle (back page has relatively exhaustive list); infants and developmentally delayed individuals can be particularly challenging.

Advance organizer/pretest and how delivered	N/A
Personnel-simulation specialist, Actors/family members	Consider actor (daycare worker, parent arriving a few minutes into resuscitation) as significant figure with knowledge of patient history to give details to staff who may request further detailed history
Estimated time to run simulation and debriefing	Simulation 10 minutes Debriefing 10 minutes
Need for reevaluation (time frame)	N/A

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- Too much time on airway as worried for foreign body, not aggressive with volume and pressures → leads to bradycardia and arrest
- Not aggressive enough with managing airway → leads to severe hypoxia, then bradycardia and arrest
- Delay in getting epinephrine to bedside → leads to rapid deterioration, including hypoxia, bradycardia and arrest



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