

PEDIATRIC ANAPHYLAXIS

Facilitator Guide | Ontario Paramedic CME

Complex / Progressive School Lunch Anaphylaxis Scenario

Scenario Purpose

Assess recognition of pediatric anaphylaxis after a probable food exposure; prioritize IM EPINEPHrine; recognize persistent respiratory compromise; reassess response; manage evolving airway, breathing and circulatory problems; and communicate an organized handoff.

Facilitator Overview

Item	Details
Participants	6–15 paramedics (mixed PCP & ACP groups)
Active roles	2 paramedics + 1 teacher/school staff actor; remaining participants observe
Resources	No additional ambulance crew or ACP intercept/backup
Scenario time	Approximately 15–20 minutes
Debrief time	30–40 minutes
Patient	9-year-old child, approximately 30 kg
Clinical focus	Food-triggered anaphylaxis → persistent bronchospasm → evolving shock/airway concern

Learning Objectives

- Perform a rapid pediatric PAT and ABC assessment and identify anaphylaxis from the history and presentation.
- Recognize that hypotension is not required before treating anaphylaxis.
- Administer IM EPINEPHrine promptly and avoid delaying treatment for secondary tasks.
- Reassess respiratory effort, oxygenation, perfusion and mental status after treatment.
- Recognize persistent respiratory symptoms as ongoing clinically significant anaphylaxis.
- Use adjuncts such as oxygen, bronchodilator therapy and fluid therapy only as appropriate to the presentation and current scope/directives; do not substitute adjuncts for EPINEPHrine.
- Anticipate airway edema, bronchospasm, vomiting/aspiration and shock.
- Communicate a concise exposure/treatment/response handoff to the receiving hospital.

Participant Organization & Setup

Participant Organization

- Attending Paramedic: leads assessment, recognition, treatment, transport planning and communication.
- Partner Paramedic: assists with airway/breathing, monitoring, medication preparation, vascular access and reassessment.
- Teacher / School Staff Actor: provides history and becomes increasingly concerned as the child deteriorates.
- Observers: do not coach the crew; contribute observations during the debrief.

Equipment / Simulation Setup

- Pediatric manikin.
- iSim monitor with SpO₂ and ETCO₂.
- Pediatric BVM, oxygen delivery devices, suction and airway adjuncts.
- Simulated EPINEPHrine 1 mg/mL (1:1,000) with appropriate IM supplies.
- Salbutamol setup if within the crew's current directive/scope.
- IV/IO equipment.
- Glucometer, thermometer, pediatric dosing reference and current ALS PCS.
- School staff/teacher actor script.

Pre-Brief (5 minutes)

- *Introduce simulation: **15-20-minute in-class scenario (respect this time and set a timer as to not go over or you will lose the learners)** + 30-40-minute learner-led debrief where everyone will have a chance to participate and ask questions.*
- Explain that this is a formative simulation with no evaluation component.
- State the learning objectives:
 - Structured pediatric assessment
 - Recognition of deterioration
 - Early treatment
 - Reassessment
 - Clinical reasoning
 - Communication
- Orient learners to the equipment and simulation limitations.
- Delegate roles: ask for any volunteers to be attending paramedic, partner paramedic, and one teacher actor on scene (provide them with the necessary script and allow for review for a couple of minutes). If no one wants to be the teacher, then you as the facilitator can use the script. Inform the remainder of the class that their role is observers and that they will be called upon during the debrief (hint: pay attention!).
- Let them know you will be taking notes to remind yourself of things to discuss in the debrief and that you are present but NOT part of the scenario (no evaluation). Ask if anyone has any questions before we get started.
- Reinforce psychological safety and confidentiality.

Case Summary Given to Learners

"You are dispatched to an elementary school for a 9-year-old child experiencing difficulty breathing after lunch."

Scenario Stem & Phase 1

Note: Ensure the timer is set for maximum 20 minutes and respect this time for the scenario, do not let it go over or drag on. Take notes for yourself for the debrief on what went well and what can be improved so you remember to discuss it later on and close any knowledge gaps.

Dispatch Information

"Code red, elementary school, 9-year-old child, difficulty breathing after lunch."

Information Given When Asked

- The child has a known peanut allergy.
- During lunch, the child accidentally ate another student's cookie.
- Approximately 10 minutes later, the child complained of an itchy mouth and stomach pain.
- The child has now developed difficulty breathing and widespread hives.
- No EPINEPHrine was administered before paramedic arrival.
- School staff have the child's prescribed auto-injector available.
- No known recent illness, trauma or medication exposure.

Phase 1 – Arrival: Recognize Anaphylaxis (0–5 min)

Finding	Initial presentation
Appearance / LOC	Alert, anxious/restless, answers questions appropriately
Airway	Patent; reports itchy/tight throat; no stridor initially
Breathing	RR 30/min; audible wheezing; mild intercostal retractions; short sentences
SpO ₂	94% room air
Circulation	HR 135/min; BP 100/65 mmHg; cap refill ~2 sec
Skin	Generalized urticaria face, neck and trunk; warm/flushed
GI	Two episodes of vomiting; earlier abdominal discomfort

Teacher opening: "He ate a cookie and then said his mouth was itchy. Now he can't catch his breath."

Expected Actions

- Perform PAT and rapid ABC assessment.
- Recognize probable anaphylaxis from the exposure plus respiratory, skin/mucosal and gastrointestinal findings.
- Do not wait for hypotension or cardiovascular collapse.
- Administer IM EPINEPHrine promptly.
- Position for comfort while avoiding unnecessary exertion; provide oxygen as clinically indicated.
- Remove/stop ongoing exposure if feasible without delaying treatment.
- Apply monitoring and prepare for deterioration.
- Obtain focused history: allergen, time of exposure, prior anaphylaxis events, medical history, medications, EPINEPHrine already given, vomiting and symptom progression.

Phase 2 – Persistent Respiratory Symptoms

At Approximately 5–10 Minutes

After appropriate initial treatment, the child is less distressed but remains wheezy. The hives are beginning to improve.

Finding	After initial EPINEPHrine
Appearance	Alert, anxious but less restless
Airway	Still patent; throat feels “a little tight”
Breathing	RR 32/min; persistent diffuse wheeze; moderate retractions
SpO ₂	96% with oxygen
HR	132/min
BP	102/64 mmHg
Skin	Hives less prominent
GI	No further vomiting

Facilitator Cue

If the crew says “the hives are better, so the reaction is resolving,” provide the respiratory findings above and ask what they think about the persistent wheezing and work of breathing.

Expected Priorities

- Recognize that improvement in one body system does not establish resolution of anaphylaxis.
- Reassess airway, breathing and circulation continuously.
- Consider persistent anaphylaxis and the need for repeat IM EPINEPHrine when indicated by the current directive and clinical response.
- For significant bronchospasm persisting after EPINEPHrine, consider salbutamol as an adjunct; do not use it as a replacement for EPINEPHrine.
- Continue oxygen/ventilatory support as clinically indicated.
- Prepare for worsening airway edema and shock.
- Begin transport planning early rather than waiting for complete symptom resolution.

Teaching Question

“Has the patient improved enough, or are you still concerned about ongoing anaphylaxis? What finding is most important right now?”

Phase 3 – Deterioration / Shock

At Approximately 10–15 Minutes

While the crew is reassessing and preparing for transport, the child suddenly becomes more pale and weak.

Finding	Deterioration
Appearance / LOC	Anxious → tired; answers slowly
Airway	Increasing hoarseness; reports throat swelling
Breathing	RR 36/min; severe wheeze; marked accessory muscle use
SpO ₂	91% despite oxygen
HR	148/min
BP	82/48 mmHg
Cap refill	4 seconds
Skin	Pale/flushed, cool extremities; hives still present
GI	Abdominal cramping returns; one further episode of vomiting

Expected Recognition

- The child has ongoing, worsening anaphylaxis with respiratory compromise and shock.
- The new hypotension is a sign of deterioration.
- Increasing hoarseness/throat swelling raises concern for upper-airway edema.
- Prepare for rapid deterioration.

Expected Actions

- Reassess ABCs immediately and call for/activate additional resources as appropriate.
- Administer repeat IM EPINEPHrine; do not delay for IV access.
- Support ventilation/oxygenation; prepare BVM and airway equipment.
- Establish IV/IO access if feasible without delaying time-critical treatment.
- If hypotension persists after EPINEPHrine, manage according to the current applicable Intravenous and Fluid Therapy directive.
- Consider bronchodilator therapy for persistent bronchospasm when authorized.
- Prepare for vomiting/aspiration and suction as required.
- Expedite transport and notify the receiving facility early.

Phase 4 – Response / Transport/Scenario End

If Appropriate Treatment Is Given 15-20 Minutes (Time Warp if needed)

Finding	Response
Appearance / LOC	More alert; speaks in longer phrases
Airway	Hoarseness improves; no stridor
Breathing	RR 28/min; wheeze improving; work of breathing reduced
SpO ₂	97% with oxygen
HR	126/min
BP	96/58 mmHg
Cap refill	2–3 sec
Skin	Hives fading; extremities warmer
GI	No further vomiting

If Treatment Is Delayed

If EPINEPHrine is delayed or the crew focuses on antihistamine/bronchodilator therapy alone, allow the patient to worsen: increasing hoarseness, severe wheeze, SpO₂ ~86–89%, BP ~70/40, increasing fatigue and reduced responsiveness. The facilitator should then prompt the crew to recognize impending respiratory/circulatory failure.

Scenario End

- Give the crew approximately 60 seconds to prepare a receiving-hospital patch.
- The child is improving but remains high risk and requires ongoing monitoring and transport.
- No further symptom-free observation phase is required in this simulation; focus on the quality of reassessment, treatment and handoff.

Example Patch

“Nine-year-old, approximately 30 kg, known peanut allergy. Ingested a cookie at school, followed about 10 minutes later by oral itching, abdominal pain, generalized urticaria and respiratory distress. Initial SpO₂ 94% on room air with wheezes and retractions. IM EPINEPHrine administered at [time/dose/route/location]. Initially improved, then developed persistent wheezing followed by hoarseness, worsening work of breathing and hypotension. Repeat IM EPINEPHrine, salbutamol, IV access, fluid bolus, etc. Current vitals: [insert]. Airway remains [status]. ETA [time].”

Scenario Vital Signs Progression

Facilitator Reference

Provide full sets approximately every 2–3 minutes. Values are simulation cues and may be adjusted slightly based on participant interventions.

Time / Phase	HR	BP	RR	SpO ₂	ETCO ₂	Skin / Key finding
2 min – Arrival	135	100/65	30	94% RA	—	Warm/flushed, generalized hives, wheeze
4 min – After initial treatment	132	102/64	32	96% O ₂	—	Hives improving; wheeze persists
6 min – Persistent symptoms	138	100/62	34	95% O ₂	38	Moderate retractions; throat tightness
10 min – Deterioration	148	82/48	36	91% O ₂	45	Hoarse, severe wheeze, delayed cap refill
12 min – Shock/airway concern	154	72/42	10–12*	87% O ₂	55*	Fatigued; poor air movement; pale/cool
15 min – After effective treatment	126	96/58	28	97% O ₂	40	Less wheeze; improving perfusion
16 min – Transport	118	100/62	24	98% O ₂	38	Alert, tired, hives fading

*A falling respiratory rate with worsening mental status/air movement is intended to represent fatigue and impending respiratory failure, not improvement.

Facilitator Adjustment Rules

- If EPINEPHrine is given promptly and reassessment is strong, move toward improvement.
- If EPINEPHrine is delayed, respiratory effort and perfusion worsen.
- If the crew recognizes shock and treats appropriately, allow BP/perfusion to improve.
- If the crew relies on antihistamine or salbutamol as primary treatment, do not allow full resolution until EPINEPHrine is appropriately addressed.

30–40 Minute Facilitated Debrief

The debrief should be approximately twice the length of the scenario, though it is perfectly acceptable if the discussion concludes earlier. This is where learners typically gain the greatest insight, as it provides an opportunity to reflect on their decisions, clinical reasoning, communication, and performance. The debrief should be learner-led whenever possible. As a facilitator, aim to do less talking and more guiding, allowing participants to identify strengths, challenges, and key takeaways themselves. Debrief notes are included to help facilitate discussion and can be used as prompts for quieter groups when needed.

Debrief Goal & Structure

Connect early recognition of anaphylaxis to time-critical EPINEPHrine, then connect persistent symptoms to reassessment, escalation and preparation for airway/circulatory deterioration.

Note: include everyone including the observers and the actor parent. Everyone has a chance to speak.

- Ask individuals about initial reactions. Ask: How did that feel? Ensure learners focus on reactions. If they start talking about what occurred in the scenario, bring them back to feelings and let them know you'll come back to that thought.
- Ask someone to provide a brief summary of what occurred in the simulation (volunteer?) and ask if everyone agrees.
- Review the specific learning objectives on the very first page with the learners.
- Get into the plus/delta – “what went well” (plus) first and stay in this column – avoid only using umbrella terms like, “good communication” – if you receive a response like this then dig deeper and ask, “what about it, be more specific.” See if everyone agrees with what went well and then move into the, “what can be improved upon column.” (Delta). See if everyone once again agrees and get specific. This is learner led and you are there just to facilitate the discussions and ensure they remain respectful for psychological safety. Let them try to close the knowledge gaps on their own if there are any. You will have the opportunity to close any gaps/correct anything in the next step.
- Facilitator feedback: close any knowledge gaps, give direct feedback if you saw anything that was incorrect so the learner doesn't leave thinking they did the right thing. Use words like, “I noticed when you did this, next time you should do...” or “I noticed...I am concerned because of this...I am curious what you were thinking or what made you do it that way.” No judgment and come from a curiosity perspective.
- Lastly, go around the room and ask each learner 1-2 take away points and ask how they will incorporate that into their practice.
- Thank everyone for participating and ask if there are any questions.

1. Reactions & Psychological Safety

- “What went well?” Start with reactions and experience before discussing technical gaps.
- Ask the active crew first, then observers.
- Ensure learners focus on reactions. If they start talking about what occurred in the scenario, bring them back to feelings and let them know you'll come back to that thought.

2. Plus/Delta

- “What went well” (PLUS) first and stay in this column
 - Avoid only using umbrella terms like, “good communication” – if you receive a response like this then dig deeper and ask, “what about it, be more specific.”
 - See if everyone agrees with what went well and then move onto delta.
- “What can be improved upon column.” (DELTA).
 - See if everyone once again agrees and get specific. This is learner led and you are there just to facilitate the discussions and ensure they remain respectful for psychological safety.
- Let them try to close the knowledge gaps on their own if there are any. You will have the opportunity to close any gaps/correct anything in the next step.

3. Initial Recognition

- What findings made you think this was anaphylaxis?
- Did the patient need hypotension to meet your threshold for treatment?
- Which systems were involved?
- Did the timing after food exposure add to your clinical reasoning?

4. EPINEPHrine as the Priority

- What was your first priority?
- What could have delayed EPINEPHrine, and how did you prevent that?
- Did you reassess after treatment? How soon after? Did you reassess more than once (ie: just after the first treatment)?
- Did you believe the reaction had resolved? Why/Why not?

5. Deterioration

- What was the earliest sign that the child was worsening?
- Did hoarseness change affect your concerns, decisions, and/or actions?
- What equipment and resources should be prepared before the child becomes peri-arrest?

Debrief – Clinical Reasoning & Scope

6. Adjuncts vs. Definitive First-Line Treatment

- Why is salbutamol an adjunct rather than a replacement for EPINEPHrine in anaphylaxis?
- What does antihistamine treat, and what role does it play in anaphylaxis in pediatrics?
- When would fluid therapy become important?
- What airway/ventilation support should be ready if the child tires?

7. PCP vs ACP Discussion

Run the scenario once as a PCP crew and, if time permits, discuss how an ACP crew might differ. Keep the discussion tied to the current medical directives and service authorization (ie: AIV).

- PCP: recognition, immediate IM EPINEPHrine, oxygen/ventilatory support, monitoring, rapid transport and reassessment (possibly AIV).
- ACP: same time-critical priorities, with additional scope-dependent options for vascular access, shock management, airway management and other authorized interventions.
- Neither provider level should delay EPINEPHrine solely to obtain IV access.

8. Handoff

- Allergen/exposure and time.
- Initial symptoms and body systems involved.
- Initial vital signs and severity.
- EPINEPHrine dose, route, location, and time; repeat dose information (if given).
- Response to each intervention.
- Persistent or recurrent respiratory symptoms.
- Hypotension/shock and fluid therapy if used.
- Airway/ventilation support and current status.
- Complete set of vitals.

Facilitator Feedback Prompts

Use: “I noticed...”, “I was concerned because...”, and “I’m curious what you were thinking when...” Avoid judgmental phrasing. Close any important knowledge gaps before ending the debrief.

Key Teaching Takeaways & Facilitator Notes

Key Teaching Takeaways

- Anaphylaxis is a time-critical, potentially fatal systemic reaction.
- Do not wait for hypotension, shock or collapse before treating a patient with clinically significant anaphylaxis.
- IM EPINEPHrine is the priority treatment; administer promptly.
- Improvement in some symptoms does not prove that anaphylaxis has resolved.
- Persistent wheezing, increasing work of breathing, hoarseness/stridor, hypoxemia, hypotension or altered LOC are warning signs of ongoing/worsening disease.
- Salbutamol may help bronchospasm but does not replace EPINEPHrine.
- Antihistamines do not reverse upper-airway edema, hypotension or shock caused by systemic anaphylaxis. Antihistamines are not recommended in the pediatric population due to serious side effects, unpredictable reactions, decreased and unreliable efficacy.
- Prepare early for airway compromise, vomiting/aspiration, respiratory failure and shock.
- Document and hand off, the exposure, treatment(s), dose/route/location/time and response.
- Continue reassessment during transport.

Final Note

“Are there any final comments?”

“Does anyone have anything else to add?”