

An Updated Action Plan for Anaphylaxis

Aikaterini Anagnostou MD MSc PhD

Professor, Pediatric Allergy

Texas Children's Hospital

Baylor College of Medicine



Learning objectives

Learning Objective 1:

The learner will be able to discuss anaphylaxis management based on current guidelines

Learning Objective 2:

The learner will be able to delineate specific symptoms and signs in infant and toddler anaphylaxis

Learning Objective 3:

The learner will be able to describe a variety of different options in managing anaphylaxis that require shared decision-making

Areas that require attention in anaphylaxis

ER versus home management

Choice of epinephrine device

Infant/toddler versus older child symptoms



ER versus Home Management

Home observation following first dose of epinephrine

Signs and symptoms that had emerged prior to epinephrine administration resolve within minutes of epinephrine administration, without recurrence, or the patient is asymptomatic. Patients with scattered residual hives or other rash (including erythema), even those with newly emerging but isolated hives or erythema without other symptoms occurring after epinephrine administration may be observed at home provided no additional new symptoms develop.

Consider EMS activation and possibly second dose of epinephrine but may continue to observe at home if comfortable

Signs and symptoms that had emerged prior to administration of the first dose of epinephrine are improving or resolving within minutes of epinephrine administration. For example, persistence of a mild sensation of globus, nausea, coughing, or stomachache may be closely observed at home provided symptoms are improving (not worsening and are perceived to be getting better) and do not persist for longer than 10-20 minutes without any additional signs of improvement.

Activate EMS immediately, consider second dose of epinephrine, do not observe at home

Signs and symptoms that had emerged prior to epinephrine administration are not resolving. Particularly concerning symptoms would include respiratory distress, stridor, altered consciousness, cardiovascular instability, cyanosis, or incontinence not typical for their age. This would also include non-skin symptoms that fail to resolve or worsen, including but not limited to repeated (>2 total) episodes of vomiting, persistent hoarseness, cough, dysphagia, wheezing, or lightheadedness.

ER versus Home Management

Considerations for and Against Home Management of Anaphylaxis

Considerations for home management	Considerations against home management
<ul style="list-style-type: none">• Patients/caregivers engaged in shared decision process• Immediate access to at least 2 EAI• Immediate access to person(s) who can provide help if needed• Clear understanding of the symptoms warranting the immediate use of EAI, availability of the anaphylaxis treatment plan• Familiarity with the EAI device administration technique• Clear understanding of the benefits of early epinephrine treatment in anaphylaxis• Good adherence to previous treatment recommendations, for example, use EAI for anaphylaxis in the past or use of controller medications for chronic conditions	<ul style="list-style-type: none">• Patients/caregivers not comfortable with managing anaphylaxis without activating EMS/ED• No availability of EAI or only 1 EAI• Being alone, without immediate access to person(s) who can provide help if needed• Being unaware of the allergic symptoms that warrant the use of EAI• Lack of technical proficiency with administration of EAI<ul style="list-style-type: none">• Hesitance about the intramuscular injection (needle phobia)• Concerns about the potential epinephrine adverse effects• Poor adherence to previous treatment recommendations, for example, not administering EAI for anaphylaxis in the past or not using controller medications for chronic conditions• History of severe/near-fatal anaphylaxis treated with more than 2 doses of epinephrine, hospitalization, intubation

Intramuscular versus intranasal epinephrine

Injection	Intranasal
Fear of needle	Needle-free
Safety concerns related to needle: laceration, injection into the bone/blood vessel, accidental injections into extremity (patients and care givers)	No safety concern related to intranasal administration
Shorter shelf life (12-24 months)	Longer shelf life (30 months)
Strict storage conditions (20 – 25°C/68 – 77°F) Protection from light	Stable under high temperature (e.g. 50°C or 122°F for 3 months) or frozen No light protection required.
Bulky devices	Smaller devices
Training is required	Training may be required

Intramuscular versus intranasal epinephrine

Table 3. Criteria to aid decision-making with regard to intramuscular or nasal administration of adrenaline by laypersons.

Questions		Preference	
		Intra-muscular	Nasal
1.	Has successful anaphylaxis patient training already been carried out with an AAI?	++	+
2.	Has training been provided to caregivers using AAI?	++	+
3.	Has an AAI been used correctly by the patient before?	++	(+)
4.	Is the body weight less than 30 kg?	+++	–
5.	Are there any difficulties with the application technique of the AAI (e.g., visual impairment)?	–	+++
6.	Was the AAI not carried in the past due to size, storage, or portability issues?	+	++
7.	Has the AAI not been used in the past despite an acute reaction, e.g., due to reservations about an injection at the daycare center?	(+)	+++
8.	Is there such a thing as needle phobia?	–	+++
9.	Is there a reluctance to use new preparations?	++	(+)
10.	Are high or low storage temperatures to be expected (e.g., outdoor sports, travel to countries with high temperatures)?	(+)	+++
11.	Are there any pre-existing conditions of the nose that may preclude nasal administration of adrenaline (e.g., previous surgery, empty nose syndrome)?	+++	–
12.	Is there a contact allergy to benzalkonium chloride?	+++	(+)
13.	Is there a preference for a particular application?	+++	+++
14.	Is adrenaline mainly needed seasonally, making a longer shelf life advantageous?	+	++

Degree of preference: +++ very strong, ++ strong, + less strong, (+) possible, – not suitable; AAI = adrenaline auto-injector.

FOOD ALLERGY EMERGENCY CARE PLAN FOR CHILDREN (AGES 3 AND UP)

Name _____	Date of Birth _____
Allergic to _____	Asthma Yes (higher risk of severe reaction) No
Child trained and able to self-administer epinephrine Yes (may need assistance) No	Contact name _____
Contact phone number _____	Allergist/doctor name _____
Allergist/doctor signature _____	Allergist/doctor phone number _____
	Date _____

IF YOUR CHILD IS HAVING MILD SYMPTOMS:

SKIN: A few hives, mild itch, lip swelling
NOSE: Itchy, runny nose, sneezing
GUT: Mild nausea, discomfort, single vomit

DO THIS

1. Stay with child and give antihistamine.
2. If two or more mild symptoms present or symptoms progress, **GIVE EPINEPHRINE** and follow directions below.

IF YOUR CHILD IS HAVING SEVERE SYMPTOMS:

LUNGS: Shortness of breath, wheeze, coughing
MOUTH: Visible swelling of the tongue
THROAT: Tight, hoarse, trouble swallowing
SKIN: Many hives over body, widespread red/purple/gray color

HEART: Faint, weak pulse, dizzy, pale, blue/gray skin, lips, nails
GUT: Ongoing vomiting or diarrhea
OTHER: Feeling something bad is about to happen, confused/agitated

1. **GIVE EPINEPHRINE** right away and note the time when it is given. Stay with your child.
2. Next, when to **WATCH AND WAIT** and when to **CALL 911 EMERGENCY MEDICAL SERVICES (EMS)**:

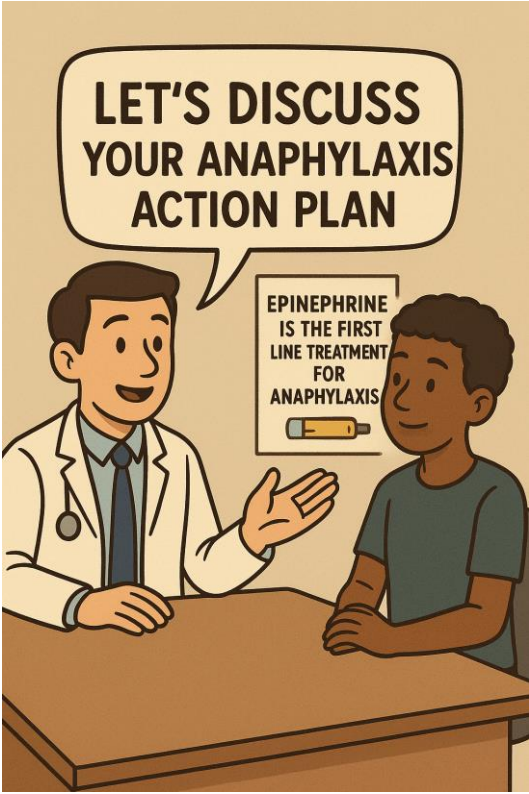
Call 911/EMS at any time, for any symptom, if you are not comfortable or if your doctor told you to do so after using epinephrine.

• Are you able to assess and check the child? • Are you comfortable watching the child? • Do you have a second dose of epinephrine?	YES	• Watch child, no need to call 911 / EMS
• Symptoms are gone or almost gone within 5-15 minutes • Hives/rash can still be there • NO new symptoms have occurred	OK	• Watch child carefully for any symptoms getting worse • Consider second dose of epinephrine and call 911/EMS if symptoms are not clearly getting better
• You feel symptoms are getting better within 5-15 minutes • Rash, mild throat discomfort/tightness, nausea, cough, or stomachache can still be there • NO new symptoms have occurred	WATCH	• CALL 911 / EMS NOW, DO NOT WATCH & WAIT • Give second dose of epinephrine if needed
• Still having trouble breathing, throat symptoms, heart symptoms, poor alertness, vomiting • Child is or was unresponsive or collapsed	CALL 911	

3. For heart symptoms or if two doses epinephrine given, lay child on their back with their legs raised.
If it is hard for the child to breathe or they are throwing up, it is ok for them to sit or lay on their side.
4. Give asthma quick-relief/rescue inhaler (see below) if your child has asthma.
5. Give antihistamine (see below).

Medications:

Epinephrine Auto-Injector: 0.15 mg 0.3 mg (inject outside thigh)	Asthma Quick Relief/Rescue Inhaler: Albuterol _____ puffs Albuterol/Budesonide _____ puffs Salmeterol _____ puffs Budesonide/Formoterol _____ puffs Mometasone/Formoterol _____ puffs	Antihistamine*: Cetirizine _____ mg Diphenhydramine _____ mg Other _____ mg *Use epinephrine first for severe symptoms
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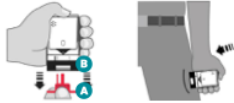


HOW TO USE EPINEPHRINE TO TREAT ANAPHYLAXIS (SERIOUS ALLERGIC REACTION)

There is one dose in each device. If a second dose is needed, use a second device.

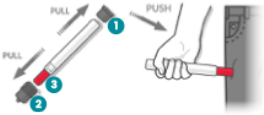
AUVI-Q™ (Epinephrine Injection, USP) Directions

1. Pull AUVI-Q up from outer case. This will automatically activate the voice instructions.
2. Pull off the red safety guard (labeled "A").
3. Place black end (labeled "B") against mid-outer thigh.
4. Press firmly and hold for 2 seconds.



Generic Adrenaclick® (Epinephrine Injection, USP) Auto-Injector Directions

1. Remove the outer case.
2. Remove gray caps labeled "1" and "2".
3. Place red rounded tip (labeled "3") against mid-outer thigh.
4. Press down hard until needle enters thigh.
5. Hold in place for 10 seconds. Remove from thigh.



EpiPen® Auto-Injector or Generic Directions

1. Remove the EpiPen Auto-Injector from the clear carrier tube.
2. Remove the blue safety release (labeled "C") by pulling straight up without bending or twisting it.
3. Swing and firmly push orange tip (labeled "D") against mid-outer thigh until it "clicks".
4. Hold firmly in place for 3 seconds (count slowly 1, 2, 3).



Neffly® Epinephrine Nasal Spray Directions

1. Remove neffy from packaging. DO NOT TEST PUMP THE DEVICE.
2. Hold the device with your thumb on the bottom of the plunger and a finger on either side of the nozzle.
3. Insert the nozzle into a nostril until your fingers touch your nose. Keep nozzle straight into the nose pointed toward your forehead.
4. Press plunger up firmly until it snaps up and sprays liquid into the nostril.
5. If second dose needed, spray into same nostril.



PBL: ALEX, A 26-year-old with food allergy and recurrent anaphylaxis

- **Reaction History**
- Multiple accidental exposures since childhood
- Prior reactions variable; some required ED care and epinephrine (not self-administered)
- **Past year:** increased reaction **frequency and severity**
 - Symptoms: GI discomfort, generalized hives
 - **Three ED visits** for reactions
 - Most recent episode required **2 doses of epinephrine**, IV fluids, and oxygen
- All reactions attributed to **milk cross-contamination**

PBL: ALEX, A 26-year-old with food allergy and recurrent anaphylaxis

- **Preparedness & Risk**
- Often forgets epinephrine auto-injector
- Not confident in how to use it properly
- **Prior Workup**
- PCP visit 3 months ago
- Food IgE panel: **milk-specific IgE = 0.38 IU/mL**
- Referred to Allergy/Immunology for evaluation
- negative to egg, peanut, soy, tree nuts, shellfish, and fish (all < 0.10 IU/ml)

Older children and adults



FOOD ALLERGY EMERGENCY CARE PLAN FOR CHILDREN (AGES 3 AND UP)

Name _____

Date of Birth _____

Allergic to _____

Asthma Yes (higher risk of severe reaction) No

Child trained and able to self-administer epinephrine Yes (may need assistance) No

Contact name _____

Contact phone number _____

Allergist/doctor name _____

Allergist/doctor phone number _____

Allergist/doctor signature _____

Date _____

IF YOUR CHILD IS HAVING MILD SYMPTOMS:

SKIN: A few hives, mild itch, lip swelling

NOSE: Itchy, runny nose, sneezing

GUT: Mild nausea, discomfort, single vomit

DO THIS

1. Stay with child and give antihistamine.

2. If two or more mild symptoms present or symptoms progress. **GIVE EPINEPHRINE** and follow directions below.

IF YOUR CHILD IS HAVING SEVERE SYMPTOMS:

LUNGS: Shortness of breath, wheeze, coughing

MOUTH: Visible swelling of the tongue

THROAT: Tight, hoarse, trouble swallowing

SKIN: Many hives over body, widespread red/purple/gray color

HEART: Faint, weak pulse, dizzy, pale, blue/gray skin, lips, nails

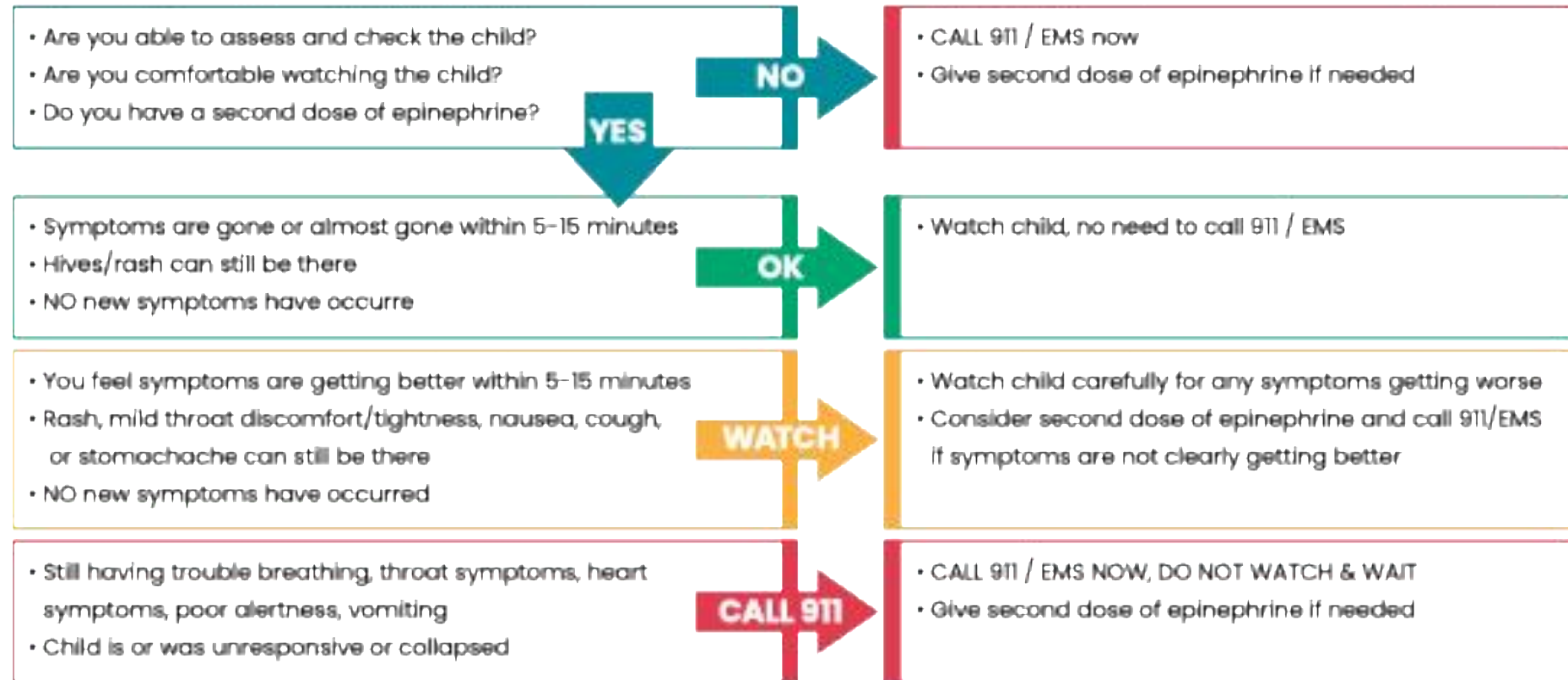
GUT: Ongoing vomiting or diarrhea

OTHER: Feeling something bad is about to happen, confused/agitated

1. **GIVE EPINEPHRINE** right away and note the time when it is given. Stay with your child.

2. Next, when to **WATCH AND WAIT** and when to **CALL 911 EMERGENCY MEDICAL SERVICES (EMS)**:

Call 911/EMS at any time, for any symptom, if you are not comfortable or if your doctor told you to do so after using epinephrine.



3. For heart symptoms or if two doses epinephrine given, lay child on their back with their legs raised.

If it is hard for the child to breathe or they are throwing up, it is ok for them to sit or lay on their side.

4. Give asthma quick-relief/rescue inhaler (see below) if your child has asthma.

5. Give antihistamine (see below).

Infants and toddlers – up to 3 y.o.



FOOD ALLERGY EMERGENCY CARE PLAN FOR CHILDREN (UNDER AGE 3)

Name _____
Allergic to _____
Contact name _____
Allergist/doctor name _____
Allergist/doctor signature _____

Date of Birth _____
Asthma Yes (higher risk of severe reaction) No
Contact phone number _____
Allergist/doctor phone number _____
Date _____

IF YOUR CHILD IS HAVING MILD SYMPTOMS:

SKIN: A few hives, mild itch, lip swelling
NOSE: Itchy, runny nose, sneezing
GUT: Mild nausea, discomfort, single vomit

DO THIS

1. Stay with child and give antihistamine.
2. If two or more mild symptoms present or symptoms progress. **GIVE EPINEPHRINE** and follow directions below.

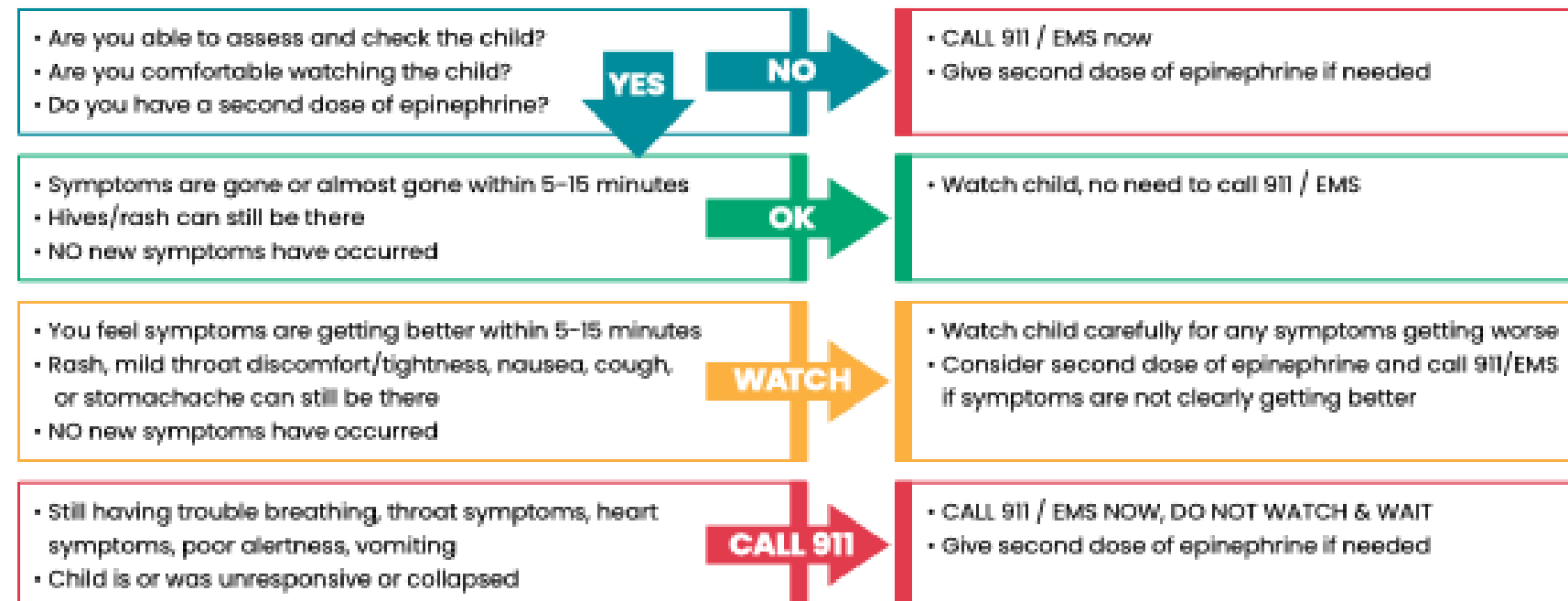
IF YOUR CHILD IS HAVING SEVERE SYMPTOMS:

LUNGS: Shortness of breath, wheeze, coughing, barky cough, nasal flaring (nostrils open wide)
SKIN: Many hives over body, widespread red/purple/gray color, irregular color or patchy/lacy appearance
HEART: Fainting, weak pulse, dizzy, pale, difficult to wake, floppy, blue/gray skin, lips, nails, feet
EYES and EARS: Eye rubbing, ear pulling or putting fingers in ears

MOUTH: Visible swelling of the tongue, tongue tugging or thrusting, drooling
THROAT: Tight, hoarse, trouble swallowing, high pitched breathing sounds, neck tugging
GUT: Ongoing vomiting or diarrhea
BEHAVIOR: Crankiness, inconsolable crying, subdued or less active, withdrawn or clingy

1. **GIVE EPINEPHRINE** right away and note the time when it is given. Stay with your child.
2. Next, when to **WATCH AND WAIT** and when to **CALL 911 EMERGENCY MEDICAL SERVICES (EMS)**:

Call 911/EMS at any time, for any symptom, if you are not comfortable or if your doctor told you to do so after using epinephrine.



3. For heart symptoms or if two doses epinephrine given, lay child on their back with their legs raised. If it is hard for the child to breathe or they are throwing up, it is ok for them to sit or lay on their side.
4. Give asthma quick-relief/rescue inhaler (see below) if your child has asthma.
5. Give antihistamine (see below).

Patient: How do I choose the right option?

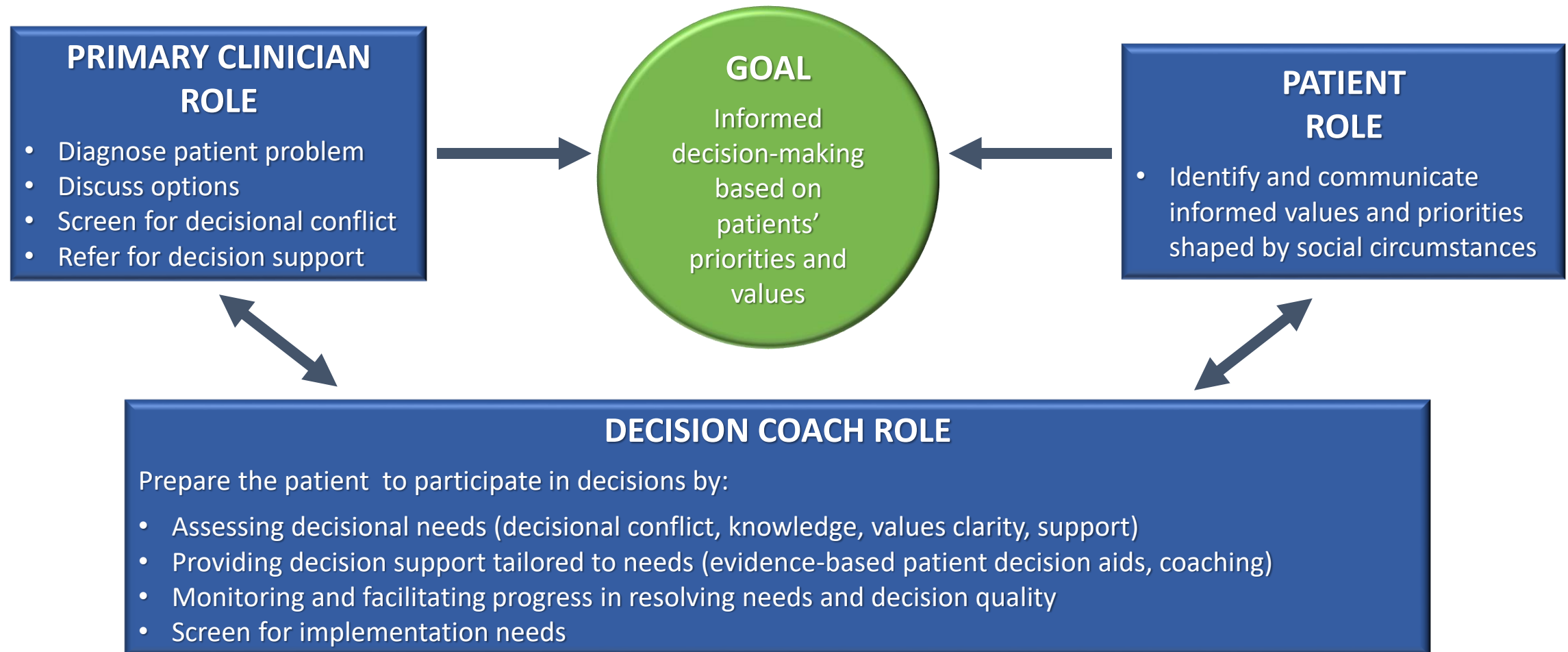
Watchful waiting or ER?



Injectable or intranasal device?

**Is my infant/toddler having
anaphylaxis?
Do I use epinephrine or not?**

Key Components of Shared Decision-Making The Ottawa Hospital Research Institute Model



Step 1: 'Let's discuss this together'

key points:

- Two-way communication between patient and physician
- Need to listen actively to patients



Step 2: 'Let's examine your options'

key points:

- Benefits and risks for different options
- Available choices and alternatives

Step 3: 'Time to make a decision if you are ready'

key point:

- Reaching the right decision for each individual patient, based on their goals, preferences and values



SUMMARY

- Anaphylaxis management has come a long way in the past few years
 - Our patients now have options
- Shared decision-making is key in achieving the optimal results for each individual patient

“Everyone you will ever meet knows something you don’t.”

Bill Nye