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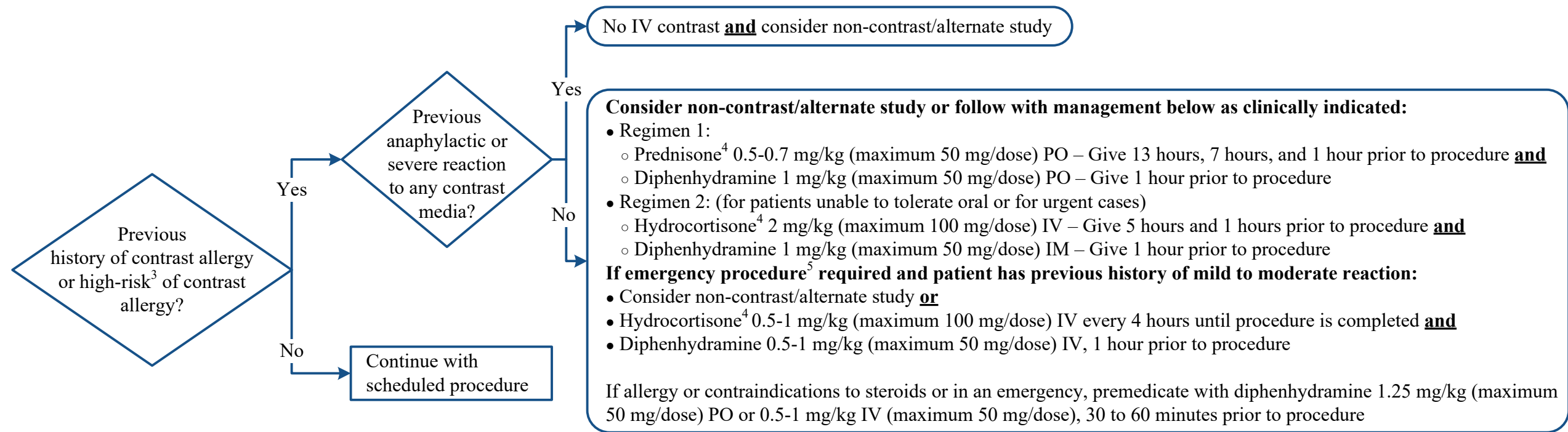
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Any signs or symptoms of hypersensitivity reaction/allergic reaction, **notify Responding Provider<sup>1</sup> and activate the appropriate emergency response process for your area.**  
**\*If available, notify MERIT: 713-792-7090\***

**Note:** Page 2 of this algorithm is intended for Providers; subsequent pages (3-9) are for both Providers and Nurses

## PREVIOUS HISTORY OF REACTIONS<sup>2</sup>

## PROPHYLACTIC TREATMENT



**Note:** See [Appendix B](#) for Rebound Reaction Prevention

<sup>1</sup> Applicable provider may include: local provider in the area where the reaction occurs, anesthesiologist, radiation oncology team, diagnostic imaging team/radiologist, *etc.*

<sup>2</sup> See [Appendix A](#) for Categories of Acute Reactions to Contrast Media

<sup>3</sup> High risk factors include patients with previous anaphylactic reactions to food or medication

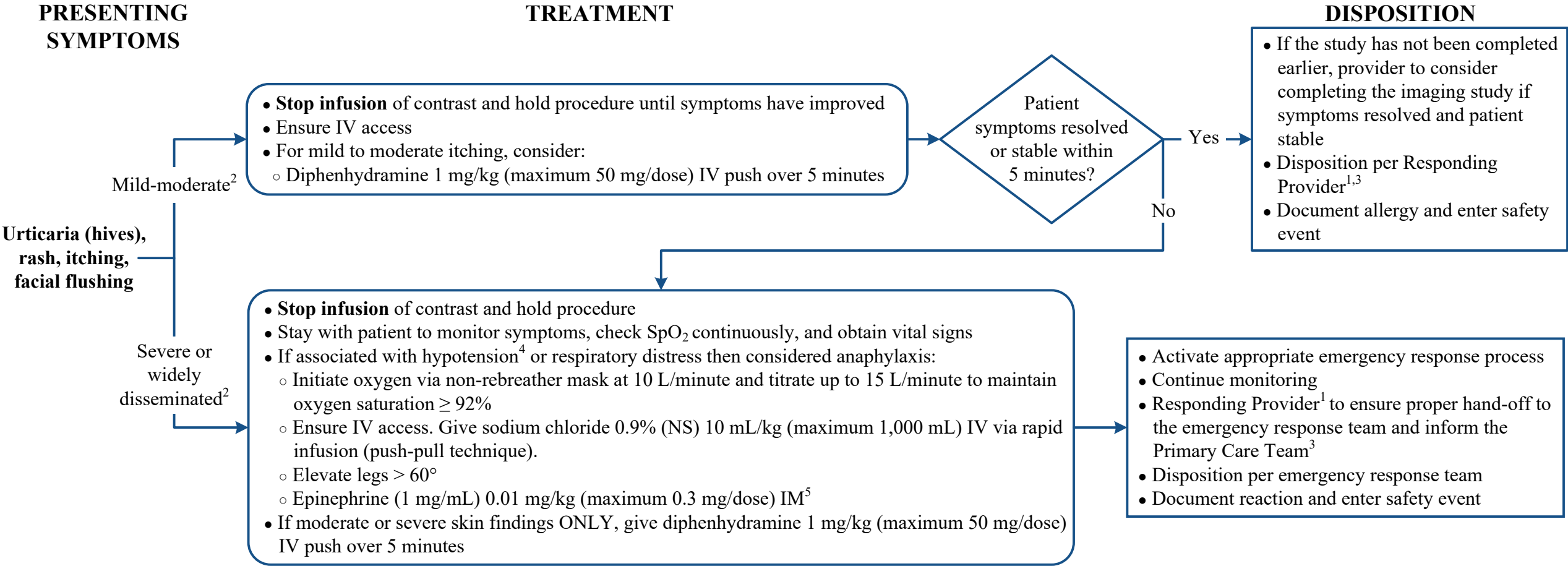
<sup>4</sup> Caution use of steroids in patients receiving Chimeric Antigen Receptor (CAR) - T cell therapy, uncontrolled hypertension, diabetes, tuberculosis, systemic fungal infections, peptic ulcer disease, neutropenic colitis, or diverticulitis.

If allergic, contact primary physician. If patient has received CAR-T cell therapy (as denoted in the patient banner in the EHR), contact Pediatric Stem Cell Transplant service.

<sup>5</sup> If the patient has an allergy to steroids and/or requires an emergency procedure, discussion between the radiologist and Primary Care Team is indicated, if feasible

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<sup>2</sup> See [Appendix A](#) for Categories of Acute Reactions to Contrast Media

<sup>3</sup> Communicate the contrast media reaction event to the Primary Care Team so that precautionary measures are considered for future scans

<sup>4</sup> Hypotension is defined as: Age 0 – 28 days: SBP < 60 mmHg; Age 1 – 12 months: SBP < 70 mmHg; Age 1 – 10 years: SBP < [70 mmHg + (age in years x 2)]; Age > 10 years: SBP < 90 mmHg

<sup>5</sup> Administer epinephrine IM into the antero-lateral mid-third portion of the thigh. Administration via IM route is preferred regardless of platelet count.

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## PRESENTING SYMPTOMS

## TREATMENT

## DISPOSITION

**Hypotension<sup>2</sup>  
with  
bradycardia<sup>3</sup>/  
vasovagal  
reaction  
(responsive  
patient)**

- Airway positioning to ensure patency and suction as needed. Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation  $\geq 92\%$ .
- Ensure IV access
- Monitor vital signs
- Elevate legs  $> 60^\circ$
- Give sodium chloride 0.9% (NS) 10 mL/kg<sup>4</sup> IV (maximum 1,000 mL) via rapid infusion (push-pull technique)

- Activate appropriate emergency response process
- Continue monitoring
- Initiate CPR if HR  $< 60$  bpm with poor perfusion

- Responding Provider<sup>1</sup>:
- Evaluate and consider:
    - Atropine 0.02 mg/kg (maximum 1 mg for infants/children and 2 mg for adolescent) IV push over 1 minute for vasovagal reaction
  - Ensure proper hand-off to the emergency response team and inform the Primary Care Team<sup>5</sup>

- Disposition per emergency response team
- Document allergy and enter safety event

**Hypotension<sup>2</sup>  
with  
tachycardia<sup>6</sup>  
(anaphylaxis)**

- Airway positioning to ensure patency and suction as needed. Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation  $\geq 92\%$ .
- Ensure IV access
- Monitor vital signs
- Elevate legs  $> 60^\circ$
- Give sodium chloride 0.9% (NS) 10 mL/kg<sup>2</sup> IV (maximum 1,000 mL) via rapid infusion (push-pull technique)
- Give epinephrine (1 mg/mL) 0.01 mg/kg IM<sup>7</sup> (maximum 0.3 mg/dose)

- Activate appropriate emergency response process
- Continue monitoring

- Responding Provider<sup>1</sup>:
- Evaluate and consider:
    - Repeating epinephrine every 5 minutes if symptoms persist/progress
  - Ensure proper hand-off to the emergency response team and inform the Primary Care Team<sup>5</sup>

**Note:** See [Appendix B](#) for Rebound Reaction Prevention

CPR = cardiopulmonary resuscitation

<sup>1</sup> Applicable provider may include: local provider in the area where the reaction occurs, anesthesiologist, radiation oncology team, diagnostic imaging team/radiologist, etc.

<sup>2</sup> Hypotension is defined as: Age 0 – 28 days: SBP  $< 60$  mmHg;  
Age 1 – 12 months: SBP  $< 70$  mmHg; Age 1 – 10 years: SBP  $< [70 \text{ mmHg} + (\text{age in years} \times 2)]$ ;  
Age  $> 10$  years: SBP  $< 90$  mmHg

<sup>3</sup> Bradycardia is defined as: Age 0 – 1 year: HR  $< 100$  bpm; Age 2 – 4 years: HR  $< 80$  bpm;  
Age 5 – 12 years: HR  $< 70$  bpm; Age 13 – 17 years: HR  $< 60$  bpm

<sup>4</sup> In patients with myocardial dysfunction or history of dysfunction, provider to consider normal saline 5-10 mL/kg while continuously monitoring for signs of fluid overload

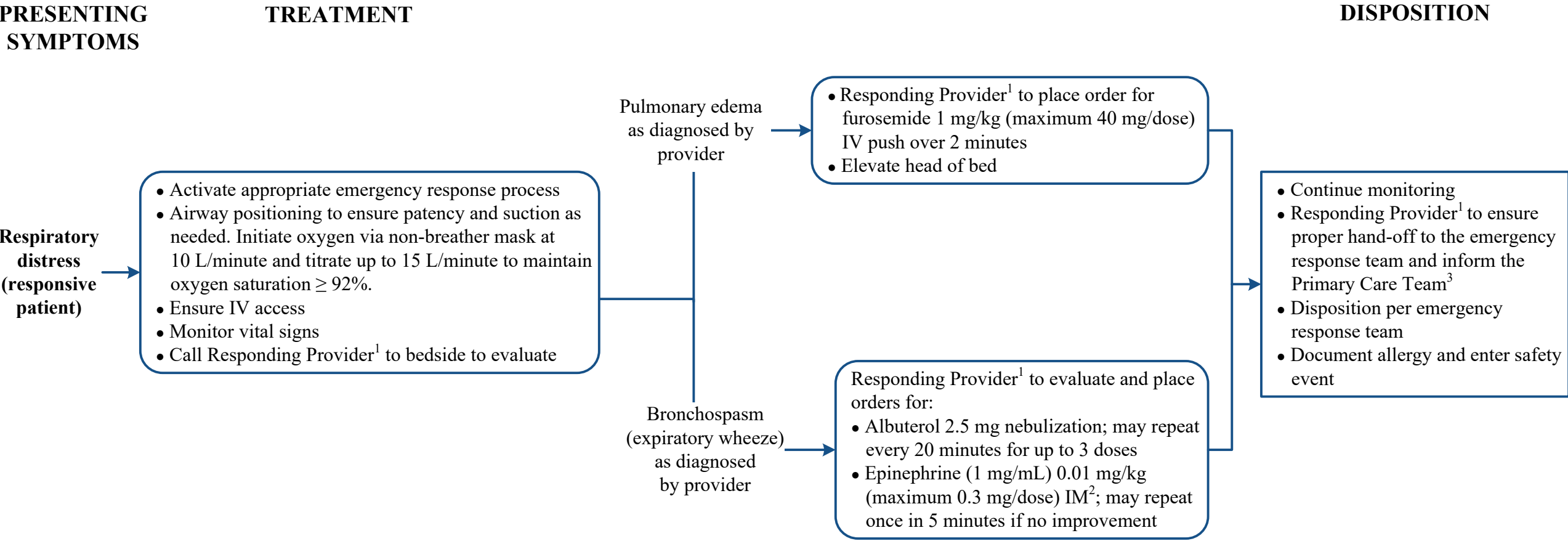
<sup>5</sup> Communicate the contrast media reaction event to the Primary Care Team so that precautionary measures are considered for future scans

<sup>6</sup> Tachycardia is defined as: Age 0 – 28 days: HR  $> 160$  bpm; Age 1 – 12 months: HR  $> 140$  bpm; Age 1 – 10 years: HR  $> 120$  bpm;  
Age  $> 10$  years: HR  $> 110$  bpm

<sup>7</sup> Administer epinephrine IM into the antero-lateral mid-third portion of the thigh. Administration via IM route is preferred regardless of platelet count.

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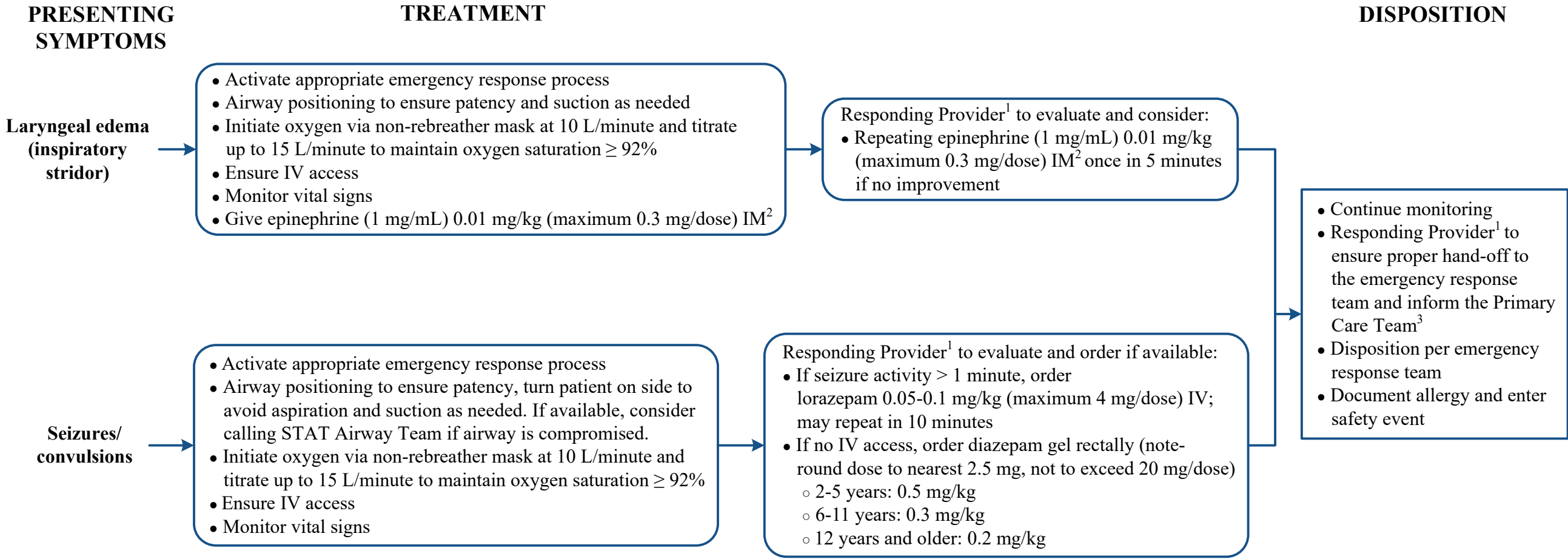
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APPENDIX A: Categories of Acute Reactions To Contrast Media

Mild Reactions

Signs and symptoms appear self-limited without evidence of progression (e.g., limited urticaria with mild pruritis, transient nausea, one episode of emesis) and include:

- Allergic-like
- Limited urticaria/pruritus
- Limited cutaneous edema
- Limited “itchy”/ “scratchy” throat
- Nasal congestion
- Sneezing/conjunctivitis/rhinorrhea

- Physiologic
- Limited nausea/vomiting
- Transient flushing/warmth/chills
- Headache/dizziness/anxiety/altered taste
- Mild hypertension
- Vasovagal reaction that resolves spontaneously

Moderate Reactions

Signs and symptoms are more pronounced. Some of these reactions have the potential to become severe if not treated and include:

- Allergic-like
- Diffuse urticaria/pruritus
- Diffuse erythema, stable vital signs
- Facial edema without dyspnea
- Throat tightness or hoarseness without dyspnea
- Wheezing/bronchospasm without hypoxia

- Physiologic
- Protracted nausea/vomiting
- Hypertensive urgency
- Isolated chest pain
- Vasovagal reaction that requires and is responsive to treatment

Severe Reactions<sup>1</sup>

Signs and symptoms are often life-threatening and can result in permanent morbidity of death if not managed appropriately and severe reactions include:

- Allergic-like
- Diffuse edema, or facial edema with dyspnea
- Diffuse erythema with hypotension
- Laryngeal edema with stridor and/or hypoxia
- Wheezing/bronchospasm with hypoxia
- Anaphylactic shock (hypotension plus tachycardia)

- Physiologic
- Vasovagal reaction resistant to treatment
- Arrhythmia
- Convulsions, seizures
- Hypertensive emergency

<sup>1</sup> Cardiopulmonary arrest is a nonspecific end-stage result that can be caused by a variety of the following severe reactions, both allergic-like and physiologic; if it is unclear what etiology caused the cardiopulmonary arrest, it may be judicious to assume the reaction is/was an allergic-like one. Pulmonary edema is a rare severe reaction that can occur in patients with tenuous cardiac reserve (cardiogenic pulmonary edema) or in patents with normal cardiac function (noncardiogenic pulmonary edema). Noncardiogenic pulmonary edema can be allergic-like or physiologic; if the etiology is unclear, it may be judicious to assume that the reaction is/was an allergic-like one.

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APPENDIX B: Rebound Reaction Prevention

Drug	Recommended Dose	Daily Maximum Dose
Hydrocortisone	5 mg/kg IV; administer over 1-2 minutes	200 mg per day
Methylprednisolone	1 mg/kg IV; administer over 1-2 minutes	40 mg per day

**Note:** While IV corticosteroids may help prevent a short-term recurrence of an allergic-like reaction, they are not useful in the acute treatment of any reaction. However, these may be considered for patients having severe allergic-like manifestations prior to transportation to the Acute Cancer Care Center, local emergency center, or inpatient unit.



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## SUGGESTED READINGS

- ACR Committee on Drugs and Contrast Media. (2023). *ACR manual on contrast media*. American College of Radiology. Retrieved from: [https://www.acr.org/-/media/ACR/Files/Clinical-Resources/Contrast\\_Media.pdf](https://www.acr.org/-/media/ACR/Files/Clinical-Resources/Contrast_Media.pdf)
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## DEVELOPMENT CREDITS

This practice consensus statement is based on majority opinion of the Contrast Media Reaction workgroup at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

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