

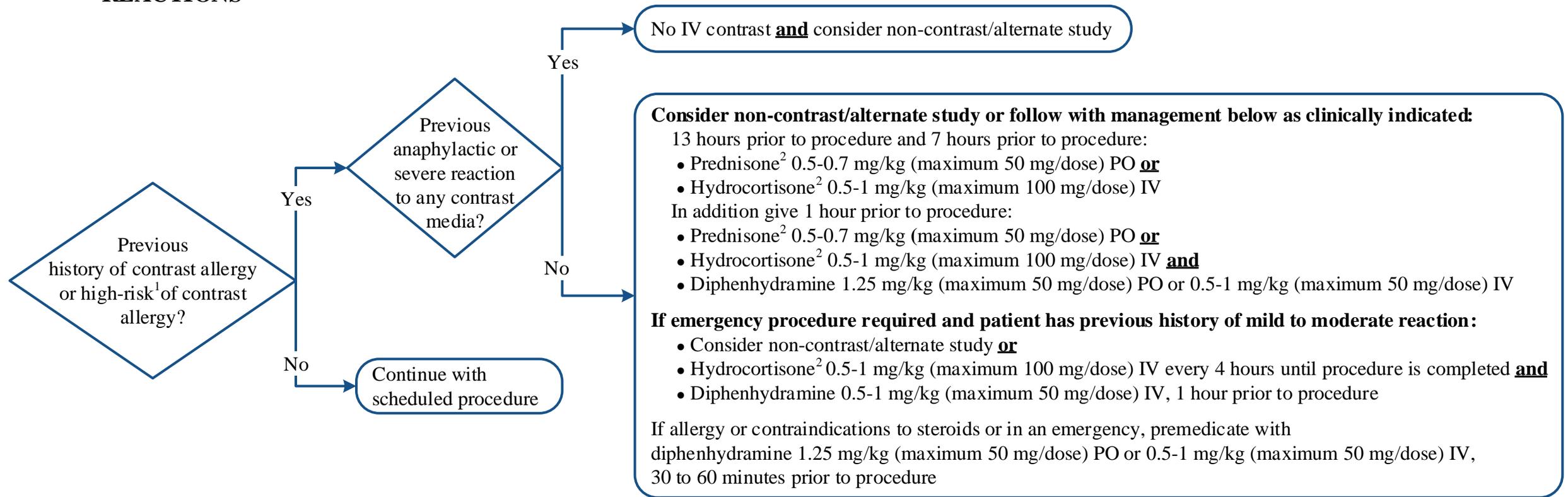
Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

Any signs or symptoms of hypersensitivity reaction/allergic reaction, **notify Radiologist and MERIT/Pediatric Intensive Care Service (PICS) (x5-0570) as appropriate.**
 If a patient is unresponsive at any point, call a **"code" as appropriate.**

Note: Page 1 of this algorithm is intended for Providers; subsequent pages (2-8) are for both Providers and Nurses

PREVIOUS HISTORY OF REACTIONS

PROPHYLACTIC TREATMENT



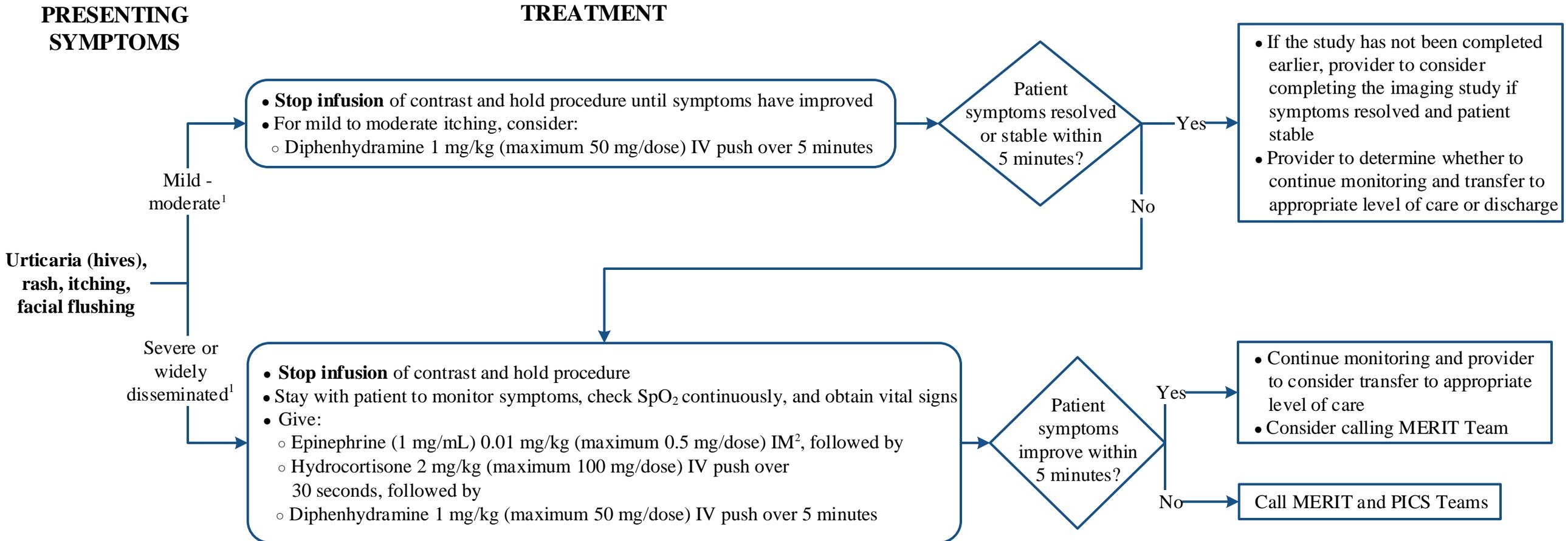
Note: See [Appendix A](#) on [Page 7](#) for Reaction Rebound Prevention

¹High risk factors include patients with previous anaphylactic reactions to food or medication

²Caution 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.

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¹ For Categories of Acute Reactions to Contrast Media see [Page 8](#)

² 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

Hypotension¹ with bradycardia²/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
- Call MERIT Team
- Place on cardiopulmonary monitoring and check vital signs
- Elevate legs $\geq 60^\circ$ (preferred) or Trendelenburg position
- Keep patient warm
- Give of sodium chloride 0.9% (NS) 20 mL/kg³ IV via rapid infusion (push-pull technique)

Symptoms improve immediately?

Yes →
No →

- Verify the MERIT Team was contacted
- Continue monitoring and consider transfer to appropriate level of care

- Initiate CPR if HR less than 60 bpm with poor perfusion
- Provider to consider epinephrine (1 mg/mL) 0.01 mg/kg (maximum 0.5 mg/dose) IM⁴
- Provider to consider atropine 0.02 mg/kg (minimum dose 0.1 mg, maximum dose 0.5 mg) IV push over 1 minute for vasovagal reaction

Patient symptoms improve within 5 minutes?

Yes
No

Hypotension¹ with tachycardia⁵

- 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
- Call MERIT Team
- Place on cardiopulmonary monitoring and check vital signs
- Elevate legs $\geq 60^\circ$ (preferred) or Trendelenburg position
- Keep patient warm
- Give of sodium chloride 0.9% (NS) 20 mL/kg² IV via rapid infusion (push-pull technique)
- Give epinephrine (1 mg/mL) 0.01 mg/kg (maximum 0.5 mg/dose) IM⁴

Symptoms improve within 5 minutes?

Yes →
No →

- Verify the MERIT Team was contacted
- Continue monitoring and consider transfer to appropriate level of care

- Verify the MERIT Team was contacted
- Call PICS Team
- Provider to consider repeating epinephrine every 5 minutes if symptoms return
- If atropine was given for vasovagal reaction and patient improved, provider to consider repeating dose once in 5 minutes

- Verify the MERIT Team was contacted
- Call PICS Team
- Call Code Team as appropriate
- If symptoms persist/progress, provider to consider repeating epinephrine every 5 minutes

¹ Hypotension is defined as: • Age 0 – 28 days: SBP < 60 mmHg • Age 1 – 10 years: SBP < [70 + (2 x age in years)] mmHg • Age 1 – 12 months: SBP < 70 mmHg • Age > 10 years: SBP < 90 mmHg
² Bradycardia is defined as: • Age 0 – 1 year: < 100 bpm • Age 2 – 4 years: < 80 bpm • Age 5 – 12 years: < 70 bpm • Age 13 – 17 years: < 60 bpm
³ 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 and calling MERIT and PICS Teams
⁴ Administer epinephrine IM into the antero-lateral mid-third portion of the thigh. Administration via IM route is preferred regardless of platelet count
⁵ Tachycardia is defined as: • Age 0 - 28 days: HR > 160 bpm • Age 1 - 10 years: HR > 120 bpm • Age 1 - 12 months: HR > 140 bpm • Age > 10 years: HR > 110 bpm

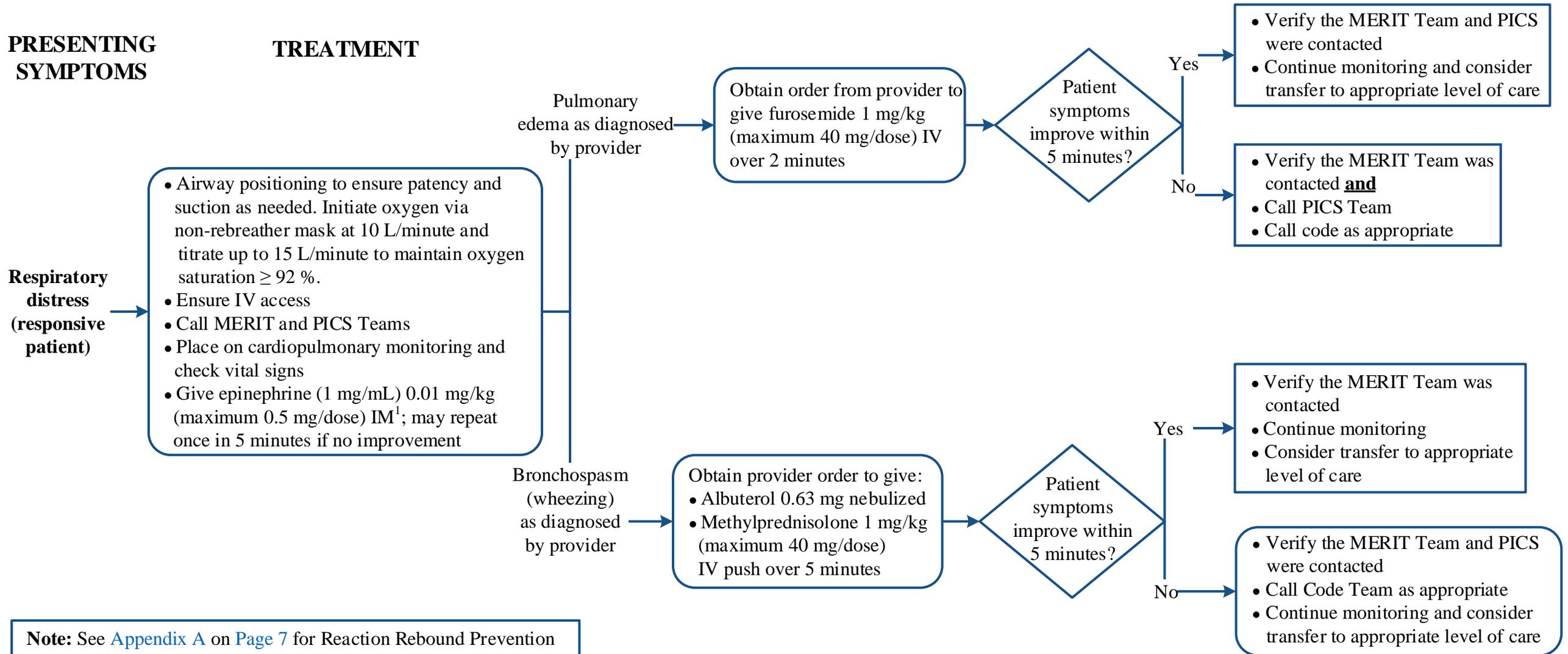
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PRESENTING SYMPTOMS

TREATMENT



Note: See [Appendix A](#) on [Page 7](#) for Reaction Rebound Prevention

¹ 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

Facial/laryngeal edema (stridor) →

- 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 ≥ 92 %. Ensure IV access.
- Call Code, PICS Team, and STAT Airway Team
- Place on cardiopulmonary monitoring and check vital signs
- Give epinephrine (1 mg/mL) 0.01 mg/kg (maximum 0.5 mg/dose) IM¹; may repeat once in 5 minutes if no improvement
- Provider to consider dexamethasone 0.5 mg/kg (maximum 10 mg/dose) IV push over 1 minute
- Provider to consider racemic epinephrine (2.25%) 0.05-0.1 mL/kg (maximum 0.5 mL/dose) nebulized; may repeat in 20 minutes
- Note: If facial edema is mild and reaction does not progress, provider to consider diphenhydramine 1-2 mg/kg (maximum 50 mg/dose) IV push over 5 minutes and observe

Seizures/convulsions →

- Airway positioning to ensure patency, turn patient on side to avoid aspiration and suction as needed. Consider calling STAT Airway Team if airway is compromised.
- Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation ≥ 92 %. Ensure IV access.
- Place on cardiopulmonary monitoring and check vital signs
- If seizure activity greater than 1 minute, obtain provider order for lorazepam 0.05-0.1 mg/kg (maximum 4 mg/dose) IV; may repeat in 10 minutes
- If no IV access, obtain provider order for diazepam gel rectally (note-round dose to nearest 2.5 mg, not to exceed 20 mg/dose)
 - 2-5 years: 0.5 mg/kg
 - 6-11 years: 0.3 mg/kg
 - 12 years and older: 0.2 mg/kg
- Call Code and PICS Teams
- Ensure STAT labs² are drawn

Note: See [Appendix A](#) on [Page 7](#) for Reaction Rebound Prevention

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² STAT labs: CBC, basic metabolic panel with total calcium, capillary blood glucose, and venous blood gas (VBG)

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PRESENTING SYMPTOMS

TREATMENT

Hypoglycemia
 (blood glucose < 70 mg/dL) → See [Hypoglycemia Management algorithm](#)

Anxiety
 (panic attack) →

- Assess patient for developing signs and symptoms that may indicate another type of reaction
- Place on cardiopulmonary monitoring and check vital signs
- If no identifiable manifestations and normal oxygenation, consider this diagnosis
- Page Child Life: 713-404-5746

If not resolved within 15 minutes:

- Call Primary Team
- Call MERIT if clinically indicated

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APPENDIX A: Rebound Reaction Prevention

Drug	Recommended Dose	Daily Maximum Dose
Dexamethasone (Decadron®)	0.5 mg/kg IV; administer over 1-4 minutes	10 mg per day
Hydrocortisone (Solu-CORTEF®)	5 mg/kg IV; administer over 30 seconds	200 mg per day
Methylprednisolone (SOLU-Medrol®)	1 mg/kg IV; administer over 5 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 an emergency department or inpatient unit.

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CATEGORIES OF ACUTE REACTIONS

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 Reactions¹

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

¹ 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 patients 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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SUGGESTED READINGS

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DEVELOPMENT CREDITS

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