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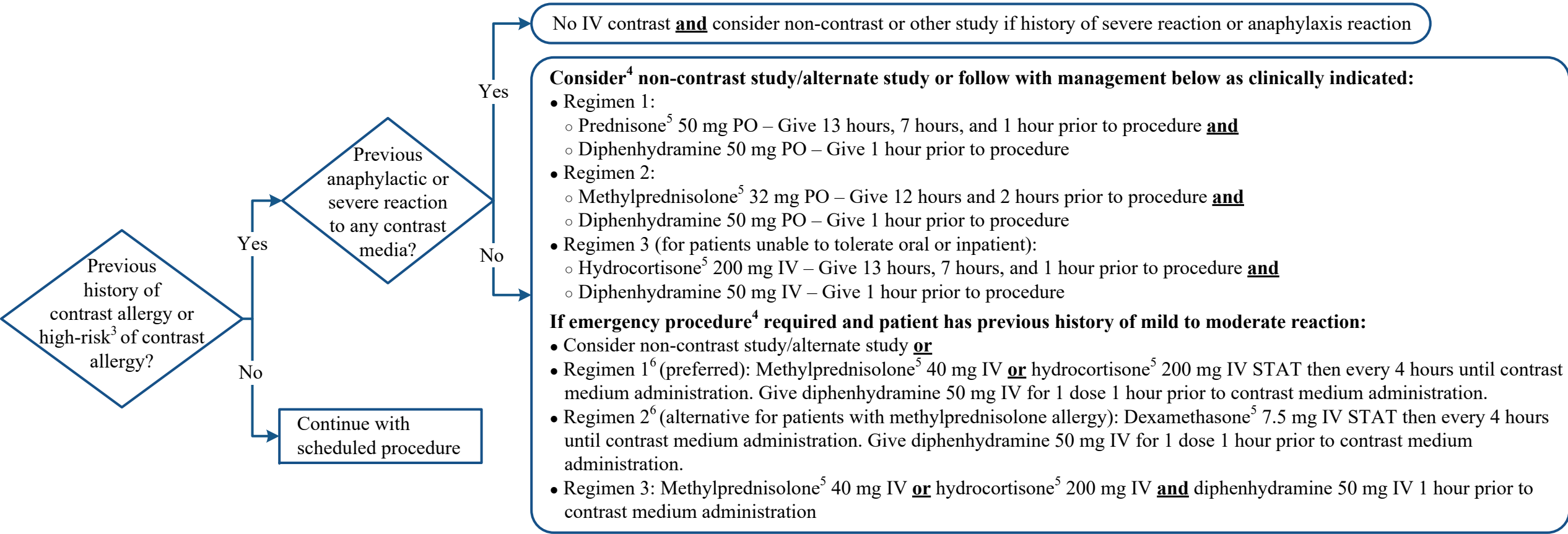
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Any signs or symptoms of HSR/allergic reaction, notify Responding Provider<sup>1</sup> and activate the appropriate emergency response process for your area.

Note: Page 2 of this algorithm is intended for Providers; subsequent pages (3-10) are for both Providers and Nurses

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

## PROPHYLACTIC TREATMENT



<sup>1</sup> Appropriate provider may include: anesthesiologist, radiation oncology team, or diagnostic imaging team/radiologist

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

<sup>3</sup> High risk factor include patients with previous anaphylactic reactions

<sup>4</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

<sup>5</sup> Caution use of steroids in patients with uncontrolled hypertension, diabetes, tuberculosis, systemic fungal infections, peptic ulcer disease, neutropenic colitis or diverticulitis. If allergic, contact primary provider.

<sup>6</sup> This regimen usually is 4-5 hours in duration

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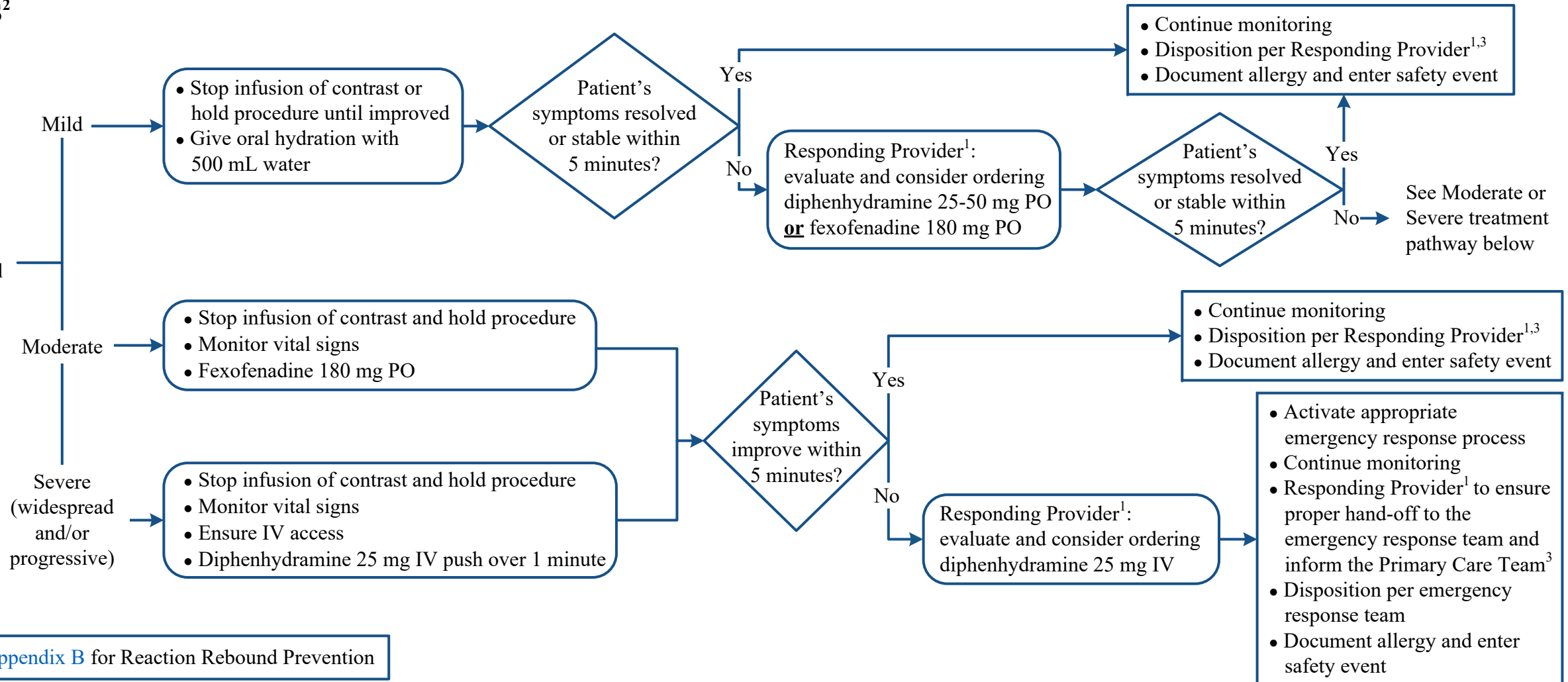
**Any signs or symptoms of HSR/allergic reaction, notify Responding Provider<sup>1</sup> and activate the appropriate emergency response process for your area.**

## PRESENTING SYMPTOMS<sup>2</sup>

## TREATMENT

## DISPOSITION

**Urticaria (hives), rash, itching, facial flushing**



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

<sup>1</sup> Appropriate provider may include: anesthesiologist, radiation oncology team, or diagnostic imaging team/radiologist

<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

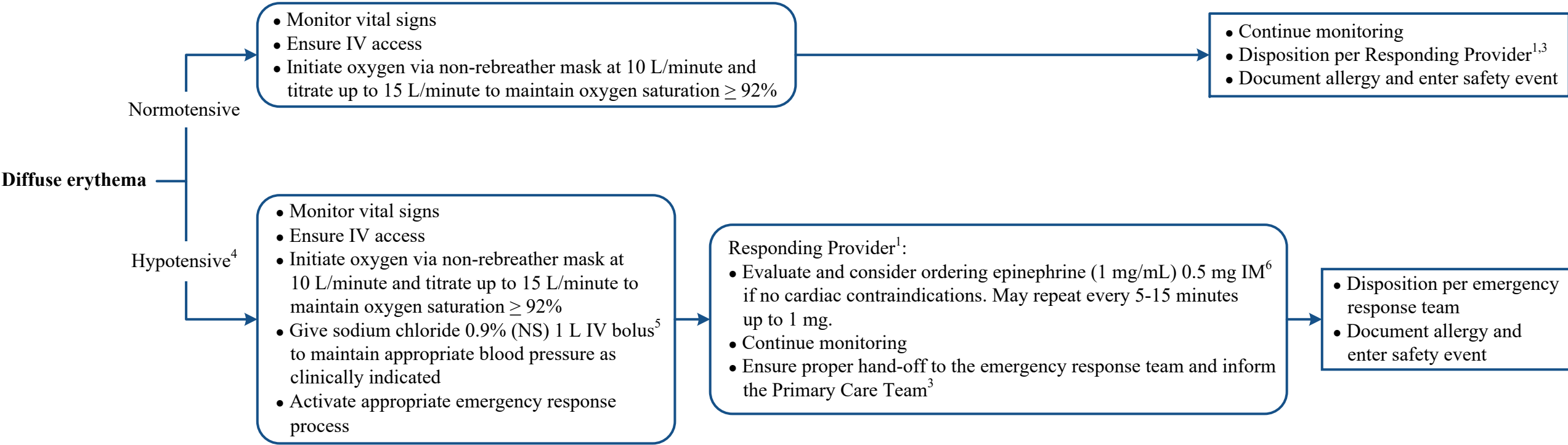
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PRESENTING  
SYMPTOMS<sup>2</sup>

TREATMENT

DISPOSITION



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

<sup>1</sup> Appropriate provider may include: anesthesiologist, radiation oncology team, or diagnostic imaging team/radiologist

<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 systolic blood pressure (SBP) < 90 mmHg **or** a drop in SBP > 20 mmHg from baseline

<sup>5</sup> Use caution pushing fluids in patients with congestive heart failure to avoid fluid overload

<sup>6</sup> If patient is on beta blockers, consult physician prior to use of epinephrine. 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<sup>2</sup>

## TREATMENT

## DISPOSITION

**Hypotension<sup>3</sup> with bradycardia<sup>4</sup>/vagal reaction (responsive patient)**

- Monitor vital signs
- Elevate legs at least 60 degrees
- Ensure IV access
- Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation  $\geq 92\%$
- Give sodium chloride 0.9% (NS) 1 L IV bolus<sup>5</sup> to maintain appropriate blood pressure as clinically indicated

- Activate appropriate emergency response process
- Continue monitoring

- Responding Provider<sup>1</sup>:
- Evaluate and order atropine 0.6-1 mg IV push over 1 minute for vasovagal reaction if appropriate monitoring is available. May repeat atropine every 5 minutes up to 3 mg total dose.
  - Evaluate and order additional IV fluid bolus
  - Ensure proper hand-off to the emergency response team and inform the Primary Care Team<sup>6</sup>

**Hypotension<sup>3</sup> with tachycardia<sup>7</sup>**

- Monitor vital signs
- Elevate legs at least 60 degrees
- Ensure IV access
- Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation  $\geq 92\%$
- Give sodium chloride 0.9% (NS) 1 L IV bolus<sup>5</sup> to maintain appropriate blood pressure as clinically indicated

- Activate appropriate emergency response process
- Continue monitoring

- Responding Provider<sup>1</sup>:
- Evaluate and order epinephrine (1 mg/mL) 0.5 mg IM<sup>8</sup> if no cardiac contraindications. May repeat every 5-15 minutes up to 1 mg.
  - Evaluate and order additional IV fluid bolus
  - Ensure proper hand-off to the emergency response team and inform the Primary Care Team<sup>6</sup>

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

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

<sup>1</sup> Appropriate provider may include: anesthesiologist, radiation oncology team, or diagnostic imaging team/radiologist

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

<sup>3</sup> Hypotension is defined as SBP < 90 mmHg **or** a drop in SBP > 20 mmHg from baseline

<sup>4</sup> Bradycardia is defined as HR < 50 bpm

<sup>5</sup> Use caution pushing fluids in patients with congestive heart failure to avoid fluid overload

<sup>6</sup> Communicate the contrast media reaction event to the Primary Care Team so that precautionary measures are considered for future scans

<sup>7</sup> Tachycardia is defined as HR > 100 bpm

<sup>8</sup> If patient is on beta blockers, consult physician prior to use of epinephrine. 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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**Any signs or symptoms of HSR/allergic reaction, notify Responding Provider<sup>1</sup> and activate the appropriate emergency response process for your area.**

## PRESENTING SYMPTOMS<sup>2</sup>

## TREATMENT

## DISPOSITION

**Severe hypertension<sup>3</sup>**

- Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation  $\geq 92\%$
- Monitor vital signs
- Ensure IV access
- Activate appropriate emergency response process

- Clonidine 0.2 mg PO for one dose
- For pheochromocytoma, call Primary Care Team to order phentolamine 5 mg IV for one dose. Contact Responding Provider<sup>1</sup> to order if unable to reach primary provider.

- Responding Provider<sup>1</sup> to evaluate and consider ordering:
- Labetalol 20 mg IV push over 2 minutes; can double the dose every 10 minutes **or**
  - Nitroglycerin 0.4 mg sublingual tablet; can repeat every 5-10 minutes **and** furosemide 20-40 mg IV push over 2 minutes

**Laryngeal edema (stridor)**

- Epinephrine<sup>5</sup> (1 mg/mL) 0.5 mg IM if no cardiac contraindications
- Initiate oxygen via non-rebreather mask at 10 L/minute and titrate up to 15 L/minute to maintain oxygen saturation  $\geq 92\%$
- Monitor vital signs
- Ensure IV access
- Activate appropriate emergency response process

- Responding Provider<sup>1</sup> to evaluate and order:
- Racemic epinephrine<sup>6</sup> (2.25% nebulized solution) 0.5 mL inhaled via nebulizer for one dose **or**
  - Epinephrine (1 mg/mL) 0.5 mg IM<sup>5</sup> if no cardiac contraindications. May repeat every 5-15 minutes up to 1 mg.

- Continue monitoring
- Responding Provider<sup>1</sup> to ensure proper hand-off to the emergency response team and inform the Primary Care Team<sup>4</sup>
- Disposition per emergency response team
- Document allergy and enter safety event

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

<sup>1</sup> Appropriate provider may include: anesthesiologist, radiation oncology team, or diagnostic imaging team/radiologist

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

<sup>3</sup> Severe hypertension is defined as systolic blood pressure (SBP)  $\geq 180$  mmHg **and/or** diastolic blood pressure (DBP)  $\geq 120$  mmHg

<sup>4</sup> Communicate the contrast media reaction event to the Primary Care Team so that precautionary measures are considered for future scans

<sup>5</sup> If patient is on beta blockers, consult physician prior to use of epinephrine. Administer epinephrine IM into the antero-lateral mid-third portion of the thigh. Administration via IM route is preferred regardless of platelet count.

<sup>6</sup> Nebulized agent by respiratory therapy preferred over beta agonist inhalers such as albuterol, terbutaline, and metaproterenol

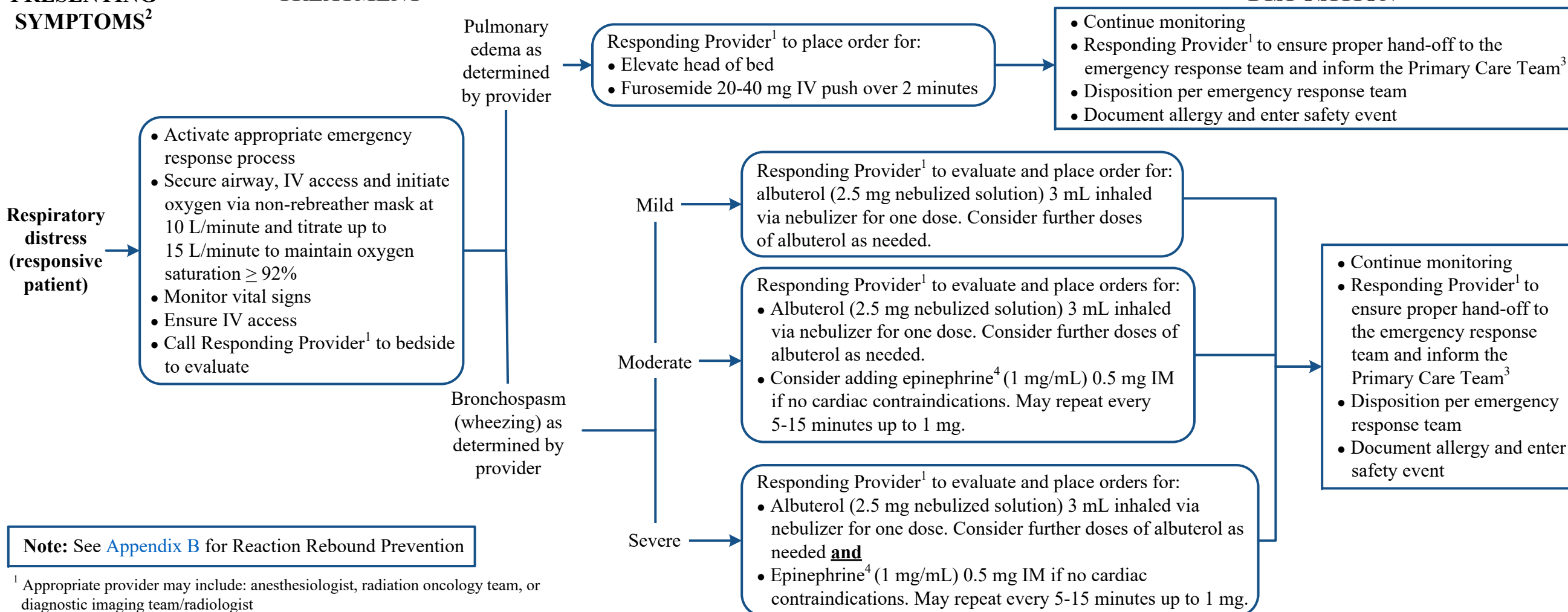
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## PRESENTING SYMPTOMS<sup>2</sup>

## TREATMENT

## DISPOSITION



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

<sup>1</sup> Appropriate provider may include: anesthesiologist, radiation oncology team, or diagnostic imaging team/radiologist

<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> Note to physician: If resistant to epinephrine, can use glucagon 1-5 mg IV (rapid administration of glucagon can cause GI upset - caution to maintain airway and prevent aspiration). If patient is on beta blockers, consult physician prior to use of epinephrine. Administer epinephrine IM into the antero-lateral mid-third portion of the thigh; administration via IM route is preferred regardless of platelet count.

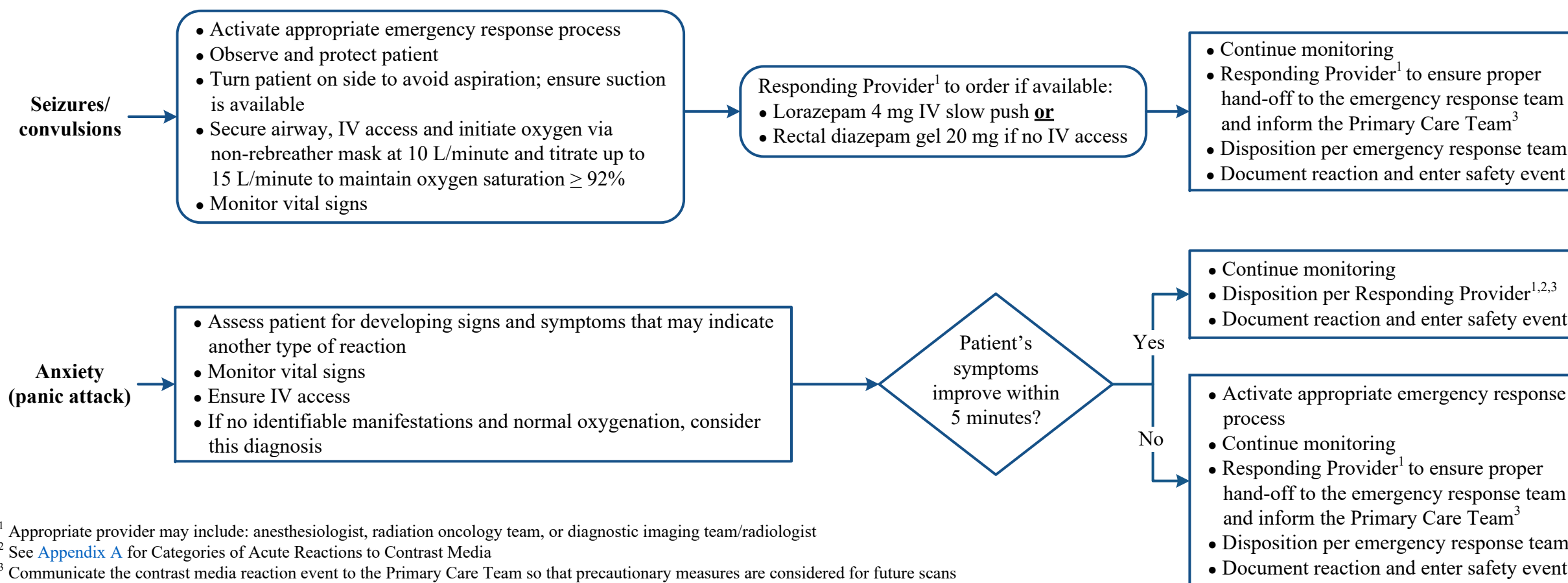
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## PRESENTING SYMPTOMS<sup>2</sup>

## TREATMENT

## DISPOSITION





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## APPENDIX A: Categories of Acute Reactions to Contrast Media

<b>Mild Reactions</b>  Signs and symptoms appear self-limited without evidence of progression ( <i>e.g.</i> , limited urticaria with mild pruritis, transient nausea, one episode of emesis) and include: <div><div><b>Allergic-like</b> Limited urticaria/pruritus Limited cutaneous edema Limited “itchy”/ “scratchy” throat Nasal congestion Sneezing/conjunctivitis/rhinorrhea</div><div><b>Physiologic</b> Limited nausea/vomiting Transient flushing/warmth/chills Headache/dizziness/anxiety/altered taste Mild hypertension Vasovagal reaction that resolves spontaneously</div></div>	
<b>Moderate Reactions</b>  Signs and symptoms are more pronounced. Some of these reactions have the potential to become severe if not treated and include: <div><div><b>Allergic-like</b> Diffuse urticaria/pruritus Diffuse erythema, stable vital signs Facial edema without dyspnea Throat tightness or hoarseness without dyspnea Wheezing/bronchospasm without hypoxia</div><div><b>Physiologic</b> Protracted nausea/vomiting Hypertensive urgency Isolated chest pain Vasovagal reaction that requires and is responsive to treatment</div></div>	
<b>Severe Reactions<sup>1</sup></b>  Signs and symptoms are often life-threatening and can result in permanent morbidity or death if not managed appropriately and severe reactions include: <div><div><b>Allergic-like</b> 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)</div><div><b>Physiologic</b> Vasovagal reaction resistant to treatment Arrhythmia Convulsions, seizures Hypertensive emergency</div></div>	

<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 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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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	Maximum dose depends on severity of reaction

**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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## SUGGESTED READINGS

ACR Committee on Drugs and Contrast Media. (2024). *ACR manual on contrast media*. American College of Radiology. Retrieved from: <https://edge.sitecorecloud.io/americancoldf5f-acrorgf92a-productioncb02-3650/media/ACR/Files/Clinical/Contrast-Manual/ACR-Manual-on-Contrast-Media.pdf>

Simons, F. E. R. (2010). Anaphylaxis. *The Journal of Allergy and Clinical Immunology*, 125(2 Suppl 2), S161–S181. doi:10.1016/j.jaci.2009.12.981

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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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