Respiratory

Section Contents

*Dyspnea Protocol*

*Pneumonia Protocol*

*Adult Asthma/Acute Bronchitis Protocol*

*Allergy Protocol*

When using any protocol, always follow the Guidelines of Proper Use.
DYSPNEA PROTOCOL
When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
(unless overridden by physician)
- Dyspnea with stable vital signs
- Not somnolent or having significant respiratory fatigue

Definition
- Subjective perception of shortness of breath

Differential Diagnosis
- COPD
- Asthma
- Bronchitis
- Pneumonia
- CHF
- Angina
- Pulmonary embolism
- Pleural effusion
- Cardiac tamponade
- Pulmonary hypertension

Dyspnea of Uncertain Cause

Evaluation
If CHF suspected order:
- BNP
- BMP
- CBC
- Troponin
- EKG
- Chest x-ray

Consider pulmonary embolism if Well’s PE criteria score 3 or greater
- Order D-dimer (can be frequently positive without DVT/PE in elderly, with history of hospitalization within past month, cancer history, edematous
Well's Pulmonary Embolism Criteria
- Suspected DVT = 3
- Alternate diagnosis less likely than pulmonary embolism = 3
- Heart rate > 100 = 1.5
- Immobilization/surgery past 4 wks = 1.5
- Previous DVT = 1.5
- Hemoptysis = 1
- Cancer past 6 months = 1

Well's PE score > 6
- Order CTA chest PE protocol after physician consultation
- Document positive/negative Homan’s sign or calf tenderness
- If anginal equivalent suspected as complaint in elderly, refer to Chest Pain Protocol

Discharge criteria
- Panic disorder or benign hyperventilation
- Benign cause of dyspnea

Consult physician
- If angina equivalent suspected
- CHF suspected or diagnosed
- Pulmonary embolism suspected
- Uncertain diagnosis as cause of symptoms
- Discuss with supervising physician if D-dimer positive or Well’s PE criteria ≥ 3 and DVT and/or PE is considered as possible cause of dyspnea

Principles of Asthma and COPD Management
- Recognizing severity of exacerbation
- Using correct therapy
- Identify and treat any precipitants
- Make correct disposition
**COPD Exacerbation**

**Evaluation options**
- Monitor cardiac and pulse oximetry
- EKG
- Troponin
- CBC
- BMP
- Chest x-ray (Check radiology report if and when available)
- Consider ABG if severely dyspneic or significant respiratory fatigue
- BNP if CHF is a consideration

**Initial Treatment options**
- Albuterol with or without atrovent, up to 3 treatments prn 10–20 minutes apart
- Oxygen therapy to keep O2 Sat ≥ 92%

**Steroid treatment options useful for moderate to severe exacerbations (caution with diabetes)**
- Effectiveness starts around 6 hours after dosing
  - Prednisone 40–60 mg PO
    OR
  - Depomedrol 80–160 mg IM
    OR
  - Decadron 10 mg IV
    OR
  - Solumedrol 80–120 mg IV

**Discharge treatment options**
- Albuterol or Combivent inhaler with or without spacer q4h prn
- Rx PO zithromax or doxycycline × 5 days, or per Sanford Guide

**Systemic steroid treatment options (caution with diabetes)**
- Prednisone 40–60 mg qd PO for 5 days
  OR
- Depomedrol 80–120 IM
  OR
- Decadron 10 mg IV
Inhaled steroid treatment options for COPD

- Consider inhaled steroid Rx to start only after acute exacerbation has resolved
  - Prescribe double dose if already on single strength dose
  - OR
  - Advair discus bid (combination of long acting beta-agonist and steroid) to be used only after acute exacerbation has resolved

Discharge criteria

- If patient returns to near baseline function with respiratory effort and O2 saturation level
- Follow up with primary care provider in 1–5 days depending on severity of presentation and response to therapy

Discharge instructions

- Follow up with primary care provider in 1–5 days depending on severity of illness and response to treatments
- Provide COPD exacerbation aftercare instructions
- Return if worse

Consult supervising physician on

- Work of breathing is moderate to severe post-treatment
- Wheezing not resolving satisfactorily
- Patient feels they are too dyspneic to go home
- WBC ≥ 15,000 or < 3,000; Neutrophil count < 1,000
- Acute thrombocytopenia
- Bandemia ≥ 15%
- Anion gap > 18
- Significant electrolyte abnormality
- Glucose > 400 mg/dL in diabetic patient
- Glucose > 200 mg/dL new onset diabetic patient
- Heart rate ≥ 110 after all treatment is completed
**Acute Asthma and Bronchitis**

**Peak flow % of predicted**
- Mild disease > 70%
- Moderate disease 40–69%
- Severe disease < 40%

**Initial Treatment Options**
- Albuterol with or without atrovent up to 3 treatments prn: 15–20 minutes apart
- Oxygen therapy to keep O2 Sat ≥ 94%; Monitor pulse oximetry

**Steroid treatment options useful for moderate to severe exacerbations in adults (caution with diabetes)**
- Effectiveness starts around 6 hours after dosing
  - Prednisone 40–60 mg PO
    OR
  - Depomedrol 80–160 mg IM
    OR
  - Decadron 10 mg IV
    OR
  - Solumedrol 80–120 mg IV

**Steroid treatment options useful for moderate to severe exacerbations in children (caution with diabetes)**
- Effectiveness starts around 6 hours after dosing
  - Prednisolone 0.5–1 mg/kg PO (NMT 60 mg)
    OR
  - Decadron 0.6 mg/kg IV or IM (NMT 10 mg)

**Additional treatment options for severe exacerbations**
- Terbutaline 0.25 mg SQ prn q15–20 minutes up to 3 as needed for age ≥ 12 years
  - Caution if history of coronary artery disease
- Terbutaline 0.005–0.01 mg/kg SQ q15–20 minutes up to 3 age < 12 years (NMT 0.4 mg per dose)
- Epinephrine 0.3 mg SQ for adults (per physician)
• Caution if history of coronary artery disease
• Epinephrine 0.01 mg/kg in children not to exceed adult dose
• MgSO4 (magnesium sulfate) 1–2 gms IV over 20 minutes in adults per physician
• MgSO4 (magnesium sulfate) 25–50 mg/kg IV over 10–20 minutes per physician (NMT 2 gm) for children
• Heliox 70:30 — do not use if > 30% oxygen needed

**Discharge treatment options**

- Albuterol or Combivent inhaler with or without spacer q4h prn
- If bacterial infection suspected: Rx PO zithromax or doxycycline (age > 8 years) × 5 days, or per Sanford Guide
- Viral infection (most healthy patients) = no antibiotics

**Discharge systemic steroid treatment options (caution with diabetes)**

- Prednisone 20–60 mg qday for 5 days (no taper needed) age ≥ 12 yrs
  OR
- Depomedrol 80–120 mg IM age ≥ 12 yrs
  OR
- Decadron 10 mg IV for adults or 0.6 mg IV for children not to exceed adult dose
- Pediatrics: prednisolone 1–2 mg/kg po qd for 5 days (NMT 60 mg per day)

**Discharge inhaled steroid options for asthma only**

- Consider inhaled steroid Rx to start only after acute exacerbation has resolved
  • Prescribe double dose if already on single strength dose
    OR
  • Advair discus bid – age > 3 years (combination of long acting beta-agonist and steroid) to be used only after acute exacerbation has resolved

**Discharge Criteria**

- Good response to therapy
- If patient returns to near baseline function with respiratory effort and O2 saturation level
- Wheezing resolution and no significant respiratory distress
- Peak flow ≥ 70% predicted if checked
- O2 saturation > 93% on room air
- Good follow up and compliance
- Primary care provider to follow up within 1–3 days if symptoms persist

Discharge instructions
  - Follow up with primary care provider in 1–5 days depending on severity of illness and response to treatments
  - Provide asthma or bronchitis aftercare instructions

Consult Criteria
- Severe respiratory distress on presentation (notify physician immediately)
- Insufficient response to treatment
- Wheezing not resolving adequately
- Patient or family feels they are too dyspneic to go home
- Cardiac cause of dyspnea suspected or confirmed
- Immunosuppression
- Peak flow < 70% predicted if measured after treatment is finished
- O2 saturation < 94% on room air post treatments
- O2 Sat < 92% in COPD patient on room air or at home O2 concentrations if on home O2 therapy
- Significant comorbid conditions
- Heart rate ≥ 110 post treatment in adults
- Hypotension develops or relative hypotension SBP < 105 with history of hypertension
- Return visit for same acute dyspnea episode
- Immunosuppression
- Age ≥ 60

Vital signs and age consult criteria
  - Age < 6 months
  - Adult heart rate ≥ 110
- Pediatric heart rate
  - 0–4 months ≥ 180
  - 5–7 months ≥ 175
  - 6–12 months ≥ 170
  - 1–3 years ≥ 160
  - 4–5 years ≥ 145
  - 6–8 years ≥ 130
  - 7–12 years ≥ 125
  - 12–15 years ≥ 115
  - 16 years or older ≥ 110
- Developing hypotension or relative hypotension (SBP < 105 with history of hypertension)
- O2 Sat < 94% on room air in non-COPD patient

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PNEUMONIA PROTOCOL
When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
● Stable vital signs

Definition
● Infection of pulmonary parenchymal tissue

Differential Diagnosis
● Pulmonary embolism
● COPD
● Asthma
● CHF
● Bronchitis
● Adult Respiratory Distress Syndrome
● Fluid overload from ESRD
● Bronchopulmonary dysplasia in children with history of prematurity

Considerations
● Number one leading cause of death from infectious disease
● Community acquired causes
  ● Strep pneumoniae
  ● Mycoplasma pneumoniae
  ● H. influenzae
  ● Legionella pneumophilia
  ● Klebsiella pneumoniae
  ● Influenza
● Comorbid conditions
  ● Advanced age
  ● Smoking
  ● COPD
  ● Diabetes
  ● Alcoholism
  ● CHF
  ● HIV
  ● Immunosuppression
• Signs and Symptoms
  • Cough
  • Sputum production
  • Fever
  • Chills
  • Rigors
  • Dyspnea
  • Chest pain
• WBC ≥ 15,000 suggests bacteria infection
• Very high or very low WBC predicts increased mortality

Evaluation
• CBC
• Chest x-ray (may be negative even if pneumonia is present)
• ABG if moderate to severe respiratory distress or fatigue
• See Dyspnea Protocol
• Blood cultures if toxic or hypotensive and/or patient is to be admitted

Treatment Options
• Oxygen for O2 saturation < 95 or respiratory distress
• Viral pneumonia needs no treatment unless immunosuppressed
• IV NS or oral rehydration if dehydrated (see Gastroenteritis Protocols for rehydration therapy)

Nontoxic patient treatment that is to be discharged

No chronic cardiopulmonary disease
  • Zithromax PO
    OR
  • Doxycycline PO

Chronic cardiopulmonary disease present
  • Second or third generation cephalosporin PO
    OR
  • Augmentin PO PLUS Zithromax PO
    OR
  • Levaquin PO as a single agent
  • May use Sanford Guide
For patients with significant respiratory distress, hypoxemia, toxicity, or are admitted:

- IV NS
- IV Zithromax and Rocephin (non-ICU)
- IV Zosyn 4.5 gms — ICU or nursing home patient
- Consult physician promptly

Discharge Criteria

- Nontoxic patient
- No respiratory distress
- O2 saturation >93%

Discharge instructions

- Pneumonia aftercare instructions
- Follow up with primary care provider within 1–3 days
- Return if worse

Consult Criteria

- Significant pneumonia
- Patients that the Provider feels need admission
- Significant respiratory distress
- High fever ≥ 104°F (40°C)
- Temperature < 96°F (35.5°C)
- Appears ill or toxic
- Metabolic or respiratory acidosis
- Immunosuppression
- See Dyspnea Protocol

Vital signs and age consult criteria

- Age > 65 or < 6 months
- Adult heart rate ≥ 110
- Pediatric heart rate
  - 0–4 months ≥ 180
  - 5–7 months ≥ 175
  - 6–12 months ≥ 170
  - 1–3 years ≥ 160
  - 4–5 years ≥ 145
  - 6–8 years ≥ 130
  - 7–12 years ≥ 125
  - 12–15 years ≥ 115
- 16 years or older ≥ 110
- Developing hypotension or relative hypotension (SBP < 105 with history of hypertension)
- O2 Sat < 94% on room air in non-COPD patient; O2 Sat < 92% in COPD patient on room air or home O2 Rx

**Lab and x-ray consult criteria**
- New onset renal insufficiency or worsening renal insufficiency
- WBC ≥ 15,000 or < 3,000; Neutrophil count < 1,000
- Bandemia ≥ 15%
- Acute thrombocytopenia
- Anion gap > 18
- Significant electrolyte abnormally
- Glucose ≥ 300 in diabetic patient
- Glucose ≥ 200 new onset diabetic patient
- Pleural effusion

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ADULT ASTHMA/ACUTE BRONCHITIS PROTOCOL

When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
(Physician can override)
- Adult asthma/bronchitis with O2 saturation > 89% on room air
- No respiratory fatigue or lethargy
- Stable vital signs

Definition
- Reversible acute bronchospasm and airway resistance secondary to infectious, allergic, environmental or internal causes

Differential Diagnosis
- Panic disorder
- Pneumonia
- Bronchitis
- CHF
- COPD
- Pulmonary embolism
- Anaphylaxis
- URI
- Vocal cord dysfunction
- Laryngospasm
- Epiglottis
- Croup
- Retropharyngeal abscess

Considerations
- Cough is commonly the first symptom
- Viral URI, allergens or environmental factors are the precipitants frequently
- Severe episode may have decreased breath sounds without wheezing
- Inability to speak more than 2–3 words at a time indicates a severe episode
- Steroids very useful — both PO and inhaled (inhaled steroids are for prophylaxis)
- Usually there is pre-existing asthma or bronchitis history

**Peak flow % of predicted**
- Mild disease > 70%
- Moderate disease 40–69%
- Severe disease < 40%

**Risk Factors**
- Prior intubation
- Visit in the last month
- Hospitalization > 1 time
- Two emergency visits past year
- Current or recent systemic steroid use
- Concomitant disease
- Illicit drug use

**Evaluation**
- Complete history and physical exam
- Assess respiratory effort
- O2 saturation
- Consider peak flows before and after aerosols
- CBC and/or BMP for significant tachycardia and fever
- Check radiology interpretations prior to discharge if available

**Chest x-ray**
- If pneumonia suspected
- Significant respiratory distress
- CHF considered as possible cause of dyspnea
- Respiratory distress not responsive to aerosols
- Age ≥ 50
- Cardiac history

**If CHF suspected**
- BNP
- Troponin
- EKG
Treatment Options

- Supplemental oxygen for O2 Sat < 95% room air or significant respiratory distress
- Albuterol with or without atrovent aerosol every 15–20 minutes prn — up to 3 treatments total

Steroid treatment options useful for moderate to severe exacerbations in adults (caution with diabetes)

Effectiveness starts around 6 hours after dosing
- Prednisone 40–60 mg PO
  OR
- May give Decadron 0.6 mg/kg IM instead (NMT 10 mg) if PO route not usable (caution with diabetes)
  OR
- Depomedrol 120–160 mg IM (caution with diabetes)

Additional treatment options if needed for severe exacerbations
- Epinephrine 0.3 mg SQ — per physician (caution with coronary artery disease history)
- Terbutaline 0.25 mg SQ prn q15–20 minutes up to 3 treatments as needed per physician (caution with coronary artery disease history)
- MgSO4 (magnesium sulfate) 1–2 gms IV over 20 minutes in adults per physician
- MgSO4 (magnesium sulfate) 25–50 mg/kg IV over 10–20 minutes per physician (NMT 2 gm) for children
- Heliox 70:30 — do not use if > 30% oxygen needed

Discharge medications
- Albuterol MDI with or without spacer prn
- Antibiotics are not usually needed
  - Consider antibiotics in smokers
  - If bacteria infection suspected, may use Sanford Guide
    • Zithromax PO
Discharge systemic steroid treatment (caution with diabetes)
- Prednisone 40–60 mg PO × 5 days (NMT 60 mg qday)
  OR
- Decadron 0.6 mg/kg IM instead (NMT 10 mg) if PO route not usable

Discharge inhaled steroids for asthma only
- Consider inhaled steroid Rx only after the acute exacerbation has resolved
  - Prescribe double dose if already on single strength dose
  OR
  - Advair discus bid for asthma or COPD only (combination long acting beta-agonist and steroid) to be used only after acute exacerbation has resolved

Discharge Criteria
- Good response to therapy
- Wheezing resolution and no significant respiratory distress
- Peak flow ≥ 70% predicted if checked
- O2 saturation > 93% on room air
- Good follow up and compliance
- Primary care provider to follow up within 1–3 days if symptoms persist

Discharge instructions
- Follow up with primary care provider in 1–5 days depending on severity of illness and response to treatments
- Provide asthma or bronchitis aftercare instructions

Consult Criteria
- Severe respiratory distress on presentation (notify physician immediately)
- Insufficient response to treatment
- Family feels patient is too ill to go home
- Peak flow < 70% predicted if measured after treatment is finished
- Moderate or severe respiratory distress post treatment
- O2 saturation < 94% on room air post treatments
• Significant comorbid conditions
• Heart rate ≥ 110 post treatment
• Hypotension develops or relative hypotension SBP < 105 with history of hypertension
• Return visit for same acute episode
• Immunosuppression
• Age ≥ 60

**Lab and x-ray consult criteria**

• New onset renal insufficiency or worsening renal insufficiency
• WBC ≥ 15,000 or < 3,000; Neutrophil count < 1,000
• Bandemia ≥ 15%
• Acute thrombocytopenia
• Anion gap > 18
• Significant electrolyte abnormally
• Glucose ≥ 400 mg/dL in diabetic patient
• Glucose ≥ 200 new onset diabetic patient
• Pleural effusion

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ALLERGY PROTOCOL
When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
- Allergic reactions with stable vital signs and without significant respiratory distress

Definition
- Systemic reaction to vascular mediator release secondary to IgE sensitization from allergen

Considerations
- Most reactions are minor with itching and localized or generalized urticaria
- Anaphylaxis is due to IgE antibody release of histamine and vasoactive mediators
- Symptom presentation possibilities
  - Occurs within 30 minutes usually
  - Can be mild
  - Wheezing
  - Dyspnea
  - Shock
  - Airway obstruction
  - Death
  - Can occur on long-term medication
- Urticaria
  - Etiology unknown usually
  - Usually self-limited
- True opioid allergy rare — usually GI upset or pseudoallergy
- Anaphylactoid reactions to contrast
  - Direct stimulation of mast cells and basophils
  - Seafood allergic patients are not allergic to radiographic contrast material
  - Related to high osmolarity of contrast materials
  - Narcotics can also cause anaphylactoid reactions
- Angioedema (may appear with urticaria)
  - Bradykinin mediated
  - Commonly from ACE inhibitors
• Decreased metabolism of bradykinin
• Hereditary C1 esterase deficiency
  • Leads to increased bradykinin
  • Positive family history
• Caution using steroids in diabetic patients
• Caution using epinephrine in patients with coronary disease risk factors (consult physician first)

Evaluation
• Vital signs
• Oropharyngeal and respiratory distress assessment
• Pulmonary and cardiac exam
• Skin exam
• Chest x-ray for significant respiratory distress or O2 saturation < 93% on room air
• Soft tissue neck films for hoarseness or complaints/findings of throat swelling
• CBC and BMP for moderate to severe systemic reactions

Urticaria
• Vascular reaction of the skin with transient wheals, soft papules and plaques usually with pruritis

Treatment options

**Benadryl**
• Adult: 50 mg PO or IM
• Pediatrics: 1–2 mg/kg PO or IM (NMT 50 mg)
• May continue for 5–7 days PO

**Pepcid**
• Adult: 20 mg IV or 40 mg PO
• Pediatric: 0.25 mg/kg IV or 0.5 mg/kg PO (not to exceed maximum adult dose)

**Epinephrine (per physician)**
• Do not use if history of coronary artery disease
• Adult: 0.3 mg SQ
• Pediatrics: 0.01 mg/kg SQ not to exceed adult dose
Consider steroids (caution if diabetic)

- Prednisone 40–60 mg PO Qday for 5–7 days (> 40 kg)
- Prednisone/prednisolone 1 mg/kg PO Qday for 5–7 days (< 40 kg)

Discharge criteria

- Discharge with good resolution of rash and itching

Discharge instructions

- Follow up with primary care provider within 7 days
- Avoid offending agent if known
- Provide urticaria aftercare instructions

Angioedema

- Non-life threatening presentation treated same as urticaria
- Less responsive to treatment than urticaria
- Evaluate for airway compromise or significant oropharyngeal swelling
- Oxygen prn
- Consult promptly for posterior oropharyngeal angioedema
- Discharge mild lip or non-oropharyngeal angioedema with normal vital signs and no distress
- Stop ACE inhibitors if currently taking

Additional treatment if needed

Epinephrine (per physician)

- Caution if history of coronary artery disease
- Adult: 0.3–0.5 mg SQ; (if respiratory distress notify physician promptly)
- Pediatrics: 0.01 mg/kg SQ not to exceed adult dose; give IV or IM (anterior thigh) if respiratory distress (notify physician promptly)
- Responds to fresh frozen plasma or C1 esterase inhibitor concentrate

Mild Anaphylaxis

- Urticaria/angioedema
- O2 saturation > 94% room air
- No respiratory distress
Treatment options

Benadryl
- Adult: 50 mg PO or IM
- Pediatric: 1–2 mg/kg PO or IM (NMT 50 mg)
- Continue for 5–7 days PO

Pepcid
- Adult: 20–40 mg IV/PO
- Pediatric: 0.25 mg/kg IV/PO (NMT 40 mg)

Consider steroids
- Prednisone 40–60 mg PO qday for 5–7 days (> 40 kg)
- Prednisone/prednisolone 1 mg/kg PO qday for 5–7 days (< 40 kg)

Additional treatment if needed

Epinephrine (per physician)
- Do not use if history of coronary artery disease
- Adult: 0.3 mg SQ (notify physician promptly)
- Pediatrics: 0.01 mg/kg SQ not to exceed adult dose (notify physician promptly)

Moderate Anaphylaxis
(Notify physician promptly)
- Urticaria/angioedema
- Wheezing
- O2 saturation 90–94% room air
- Moderate respiratory distress
- No hypotension

Treatment options

Oxygen: nasal or mask (≥ 5 liters/minute if mask used)

Benadryl
- Adult: 50 mg IV or IM
- Pediatric: 1–2 mg/kg IV or IM (NMT 50 mg)

Pepcid
- Adult: 20–40 mg IV
- Pediatric: 0.25 mg/kg IV (NMT 40 mg)

**Albuterol aerosol**
- With or without atrovent
- Repeat q15 min x 2 additional treatments prn
- Continuous prn (for severe dyspnea)

**Additional treatment if needed**

**Epinephrine (per physician)**
- Caution if history of coronary artery disease
- Adult: 0.3 mg SQ (notify physician promptly)
- Pediatric: 0.01 mg/kg SQ not to exceed adult dose (notify physician promptly)

**Glucagon**
- 1–2 mg IV if on beta-blocker or resistant to epinephrine (consult with supervising physician)

**Steroids**
- Adult: Solumedrol 125 mg IV
- Pediatric: 1–2 mg/kg IV
- Prednisone 40–60 mg PO Qday for 5–7 days (> 40 kg) if discharged
- Prednisone/prednisolone 1 mg/kg (NMT 60 mg) PO Qday for 5–7 days if discharged (pediatrics)
- May give Decadron 0.6 mg/kg IM instead (NMT 10 mg)

**Severe Anaphylaxis**
(Notify physician immediately)
- Urticaria/angioedema
- Wheezing
- O2 saturation < 90% room air
- Severe respiratory distress
- Oropharyngeal airway swelling or compromise
- Hypotension
- Intubation if impending respiratory failure — notify physician immediately
- Observation for 6 hours if to be discharged by physician
- Usually admitted
Treatment options

Oxygen: nasal or mask (> 5 liters/minute if mask used)

For shock
- IV NS 1–2 liters rapidly if hypotensive adult
- 20 cc/kg IV NS if hypotensive pediatric patient — may repeat × 2 prn

Benadryl
- Adult: Benadryl 50 mg IV (preferred) or IM
- Pediatric: 1–2 mg/kg IV (preferred) or IM (NMT 50 mg)

Pepcid
- Adult: 20–40 mg IV
- Pediatric: 0.25 mg/kg IV (NMT 40 mg)

Albuterol aerosol
- With or without atrovent
- Repeat q15 min × 2 prn
- Continuous prn for severe dyspnea

Steroids
- Adult
  - Solumedrol 125 mg IV
  - Prednisone 40–60 mg PO qday for 5–7 days (> 40 kg) if discharged
- Pediatric
  - Solumedrol 1–2 mg/kg IV (NMT 125 mg)
  - Prednisone/prednisolone 1 mg/kg (NMT 60 mg) PO Qday for 5–7 days if discharged (pediatrics)
  - May give Decadron 0.6 mg/kg IM/IV instead (NMT 10 mg)

Additional treatment if needed

Epinephrine (consult physician before administering if possible)
- Adult: 0.3–0.5 mg IV (if in shock) or IM anterior thigh
  - 1 mg IV if no pulse
  - Activate ACLS and call a code
- Pediatric: 0.01 mg/kg IV (if in shock) or IM anterior thigh (do not exceed adult doses)
- Caution with history of coronary artery disease

**Glucagon**
- 1–2 mg IV if on beta-blocker or resistant to epinephrine (per supervising physician)

**Discharge Criteria**
- Good resolution of rash and itching in urticaria
- Discharge patients presenting with mild symptoms that have observation post-treatment for 2–4 hours without symptoms

**Discharge instructions**
- Follow up with primary care provider within 7 days
- Avoid offending agent if known
- Provide allergy aftercare instructions
- Return if worse

**Consult Criteria**
- Hypotension
- O2 saturation < 95% on room air after treatments
- Moderate to severe anaphylaxis or respiratory distress on presentation or during stay
- Altered mental status
- Oropharyngeal or throat swelling or complaints of throat swelling or dyspnea
- Wheezing not resolved
- Adult heart rate ≥ 110 post treatment
- Pediatric heart rate post treatment
  - 0–4 months ≥ 180
  - 5–7 months ≥ 175
  - 6–12 months ≥ 170
  - 1–3 years ≥ 160
  - 4–5 years ≥ 145
  - 6–8 years ≥ 130
  - 7–12 years ≥ 125
  - 12–15 years ≥ 115
  - 16 years or older ≥ 110