



## Allergic Reactions

- Immune system naturally responds to foreign substances in body.
- Allergic reaction
  - Exaggerated response to foreign substance
- Allergen
  - Substance causing exaggerated effect

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## Allergic Reactions

- Inside
  - First exposure
    - Immune system forms antibodies.
    - Antibodies identify and attempt to attack particular foreign substance.
    - Antibodies combine only with allergen they were formed in response to.

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## Allergic Reactions

- Inside
  - Second (and subsequent) exposures
    - Antibodies exist.
    - Antibody combines with allergen, leading to release of histamine and other chemicals into bloodstream.
    - Chemicals cause harmful effects.

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## Allergic Reactions

- Outside
  - Effects of histamine and other chemicals
    - Inflammation (swelling)
    - Bronchoconstriction
    - Vasodilation

## Allergic Reactions

- Anaphylaxis
  - Severe, life-threatening allergic reaction
  - Can cause:
    - Rapid dilation of blood vessels (hypotension)
    - Airway swelling (airway obstruction)
    - Bronchoconstriction (respiratory failure)

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## Allergic Reactions

- Common allergens

- Insects
- Foods
- Plants
- Medications
- Others
  - Dust, makeup, soap, etc.



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## Allergic Reactions

- Latex allergy

- Common concern in EMS
  - Many patients have latex sensitivity
  - Providers can develop latex allergy from prolonged exposure



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## Allergic Reactions

- No way to predict exact course of an allergic reaction.
- Severe reaction often takes place immediately, but can be delayed 30 minutes or more.
- Mild allergic reaction can rapidly progress to anaphylaxis.

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## Allergic Reactions

- Signs and symptoms

- Skin
  - Itching
  - Hives
  - Flushing (red skin)
  - Swelling of the face
  - Warm, tingling feeling in face, mouth, chest, feet, or hands

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## Facial Swelling and Hives



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## Allergic Reactions

- Signs and symptoms

- Respiratory
  - Tightness in throat or chest
  - Cough
  - Rapid, labored, and/or noisy breathing
  - Hoarseness, muffled voice, loss of voice
  - Stridor
  - Wheezing

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## Allergic Reactions

- Signs and symptoms
  - Cardiac
    - Increased heart rate
    - Decreased blood pressure

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## Allergic Reactions

- Signs and symptoms
  - Generalized findings
    - Itchy, watery eyes
    - Headache
    - Runny nose
    - Sense of impending doom

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## Allergic Reactions

- Signs and symptoms of shock
  - Altered mental status
  - Flushed, dry skin or pale, cool, clammy skin
  - Nausea or vomiting
  - Changes in vital signs
    - Increased pulse, respirations
    - Decreased blood pressure

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## Distinguishing Anaphylaxis from Mild Allergic Reaction

- Any of previous signs and symptoms can be associated with an allergic reaction.
- Anaphylaxis
  - Patient has either respiratory distress or signs and symptoms of shock.

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## Patient Assessment

- Primary assessment
  - Identify and treat life-threatening problems.
    - Airway
    - Breathing
    - Circulation

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## Patient Assessment

- Secondary assessment
  - History of allergies
  - Exposure
    - What was the patient exposed to?
    - How (what method/route) was the patient exposed?
  - Signs and symptoms
  - Progression
  - Interventions

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## Patient Assessment

- Assess baseline vital signs.
- Obtain remainder of past medical history.

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## Patient Care

- Manage patient's airway and breathing.
- Apply high-concentration oxygen if patient is in distress or appears to be having an anaphylactic reaction.
  - Mild allergic reactions do not require oxygen.
- If not breathing, adequately provide artificial ventilations.

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## Patient Care

- Consider assisting patient with epinephrine auto-injector.
- If patient is not wheezing or showing signs of respiratory distress or shock:
  - Continue with assessment.
  - Consult medical direction regarding use of auto-injector.

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## Patient Care

- When use of auto-injector may be appropriate
  - If patient has come in contact with substance that caused allergic reaction in the past
  - If patient also has respiratory distress or exhibits signs and symptoms of shock

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## Patient Care

- After using auto-injector
  - Record administration of auto-injector
  - Transport patient
  - Reassess after 2 minutes



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## Think About It

- Should you administer an auto-injector for a simple allergic reaction?
- What assessment findings would indicate the need for epinephrine?

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## Allergic Reaction—Anaphylaxis Video



Click on the screenshot to view a video on the topic of anaphylactic shock.

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## Self-Administered Epinephrine

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## Self-Administered Epinephrine

- Commonly prescribed to patients with a history of allergy
- Auto-injectors are common for people to carry or have at home.
- Hormone produced by body
- Constricts blood vessels
- Dilates bronchioles

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## Self-Administered Epinephrine

- Administration of Epi Auto Injector
  - Authorized by medical direction
    - Indirect (protocols)
    - Online
- You can assist with administration of a patient's own epinephrine auto injector

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## Self-Administered Epinephrine

- Side effects
  - Increased heart rate
  - Increased cardiac workload

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## Self-Administered Epinephrine

- Spring-loaded needle and syringe with a single dose of epinephrine
- Upon administration, medication automatically releases and injects.



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## Types of Auto-Injectors

- Two sizes of auto-injectors

- Adult dose
  - 0.3 mg
- Children's dose (<66 pounds)
  - 0.15 mg



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## Self-Administered Epinephrine

- Administering auto-injector
  - Obtain patient's prescribed auto-injector and ensure:
    - Prescription is written for patient.
    - Medication is not discolored.
    - Medication has not expired.
  - Obtain order from medical direction.
  - Remove safety cap.

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## Self-Administered Epinephrine

- Administering auto-injector
  - Press tip of auto-injector firmly against patient's thigh (outside of thigh midway between the knee and waist).
  - Hold injector in place until medication is injected.



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## Self-Administered Epinephrine

- Administering auto-injector
  - Record administration and time.
  - Carefully dispose of single-dose injector in biohazard container
    - Save two-dose injector

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## Additional Doses of Epinephrine

- Reassessment may show patient condition deteriorating.
  - Additional doses of epinephrine may be necessary.
- Requires on-line medical control
- Requires bringing patient's additional auto-injectors in ambulance

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## Additional Doses of Epinephrine

- If no auto-injector available:
  - Request ALS intercept.
  - Treat for shock.

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## Chapter Review

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## Chapter Review

- Allergic reactions are common.
- Anaphylaxis, a true life-threatening allergic reaction, is rare.

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## Chapter Review

- The most common symptom in these cases is itching.
- Patients with anaphylaxis will also display life-threatening difficulty breathing and/or signs and symptoms of shock. Patients with anaphylaxis will be extremely anxious. Their bodies are in trouble and are letting them know it.

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## Chapter Review

- The signs and symptoms of anaphylaxis result from physiological changes: vasodilation, bronchoconstriction, leaky capillaries, and thick mucus.

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## Remember

- In an allergic reaction, the body's immune system overreacts to an allergen and causes potentially harmful side effects.
- Anaphylaxis is a severe, systemic form of allergic reaction; it is a life-threatening emergency.

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## Remember

- EMTs must use assessment to differentiate a localized allergic reaction from a systemic anaphylactic reaction.
- Epinephrine is useful in anaphylaxis because it constricts dilated blood vessels and opens bronchial passages.
- Epinephrine has potentially dangerous side effects and should be used only in the event of anaphylaxis.

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## Questions to Consider

- What are the indications for administration of an epinephrine auto-injector?
- List some of the more common causes of allergic reactions.

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## Questions to Consider

- List signs or symptoms of an anaphylactic reaction associated with each of the following:
  - Skin
  - Respiratory system
  - Cardiovascular system

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## Critical Thinking

- A 24-year-old male ate a meal that he believes contained shellfish. He is allergic to shrimp. He is sweating and nervous. He appears to be breathing adequately. You do not note any wheezing or stridor.

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## Critical Thinking

- His face is slightly red. His pulse is 88 strong and regular, respirations 24, blood pressure 108/74, and skin warm and moist. Should you administer epinephrine?

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