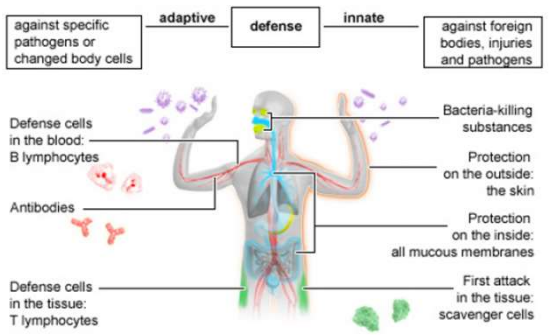


Thanks Missah. Welcome to the first lesson of this chapter on Allergic Reactions and Immunological Emergencies. Here we discuss the pathophysiology and some of the symptoms you may encounter.

Good Studying.

Anatomy of the Immune System

- Protects the body from foreign substances
- Consists of special organs, cells, and chemicals to fight the allergens
- White blood cells, antibodies, lymphatic system, spleen, thymus, and bone marrow
- Speed and intensity of response depends on the perceived severity of the threat



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First off, let's look at the anatomy of the immune system to understand why allergies even occur in the first place.

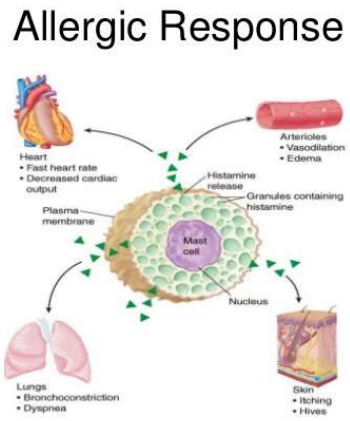
At the heart of it all, the immune system protects the body from foreign organisms and invaders. It comprises particular organs, cells, and chemicals that come together to fight a perceived invader. The main parts of an immune system are White blood cells, Antibodies, the Lymphatic system, the Spleen, the Thymus, and Bone marrow.

These different components come into play, depending on the nature and severity of the allergy and how the

immune system perceives this threat. For example, if the immune system believes it is a significant threat, the response speed will be quick and severe, while in other cases, the reaction may be more subdued.

Pathophysiology of Allergies

- Over or underactivity of immune system
- Underactive immune system leads to diseases from allergens
- Overactivity leads to autoimmune diseases and allergic reactions
- More than required strong response
- Perceived threat



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So, this brings up an important question. If our immune system is designed to protect the body from foreign objects, why does it cause allergies?

Well, immune systems are not always balanced, and there can be over or under activity from it. Underactive immune systems don't fight enough to keep the intruders at bay, leading to complications from the foreign substance.

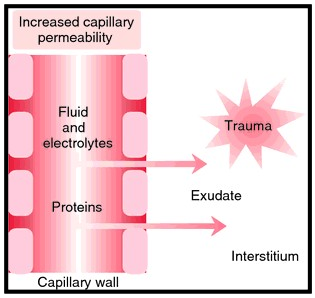
Overactivity, on the other hand, takes two forms. They are autoimmune diseases and allergic reactions. Autoimmune diseases are when the immune system

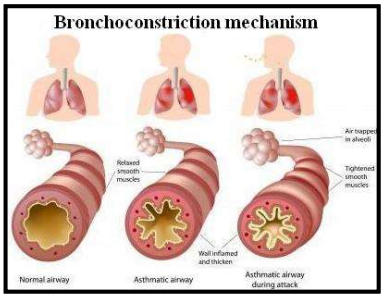
starts fighting against the human body's typical components, mistaking them to be intruders.

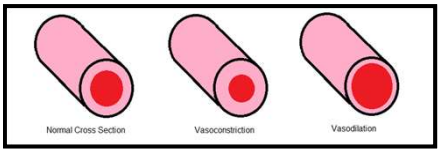
Allergic reactions are when the immune system gives a robust response to the allergens, often more than required. These reactions are relatively common, and allergies can come from food, medications, chemicals, insects, etc.

Basic Reactions of the Immune System

- Increased capillary permeability
- Vasodilation
- Bronchoconstriction
- Increased mucus production







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So, allergies trigger specific pathophysiology reactions, and you must know them so that you can identify them quickly. Let's now help familiarize you with some technical terms.

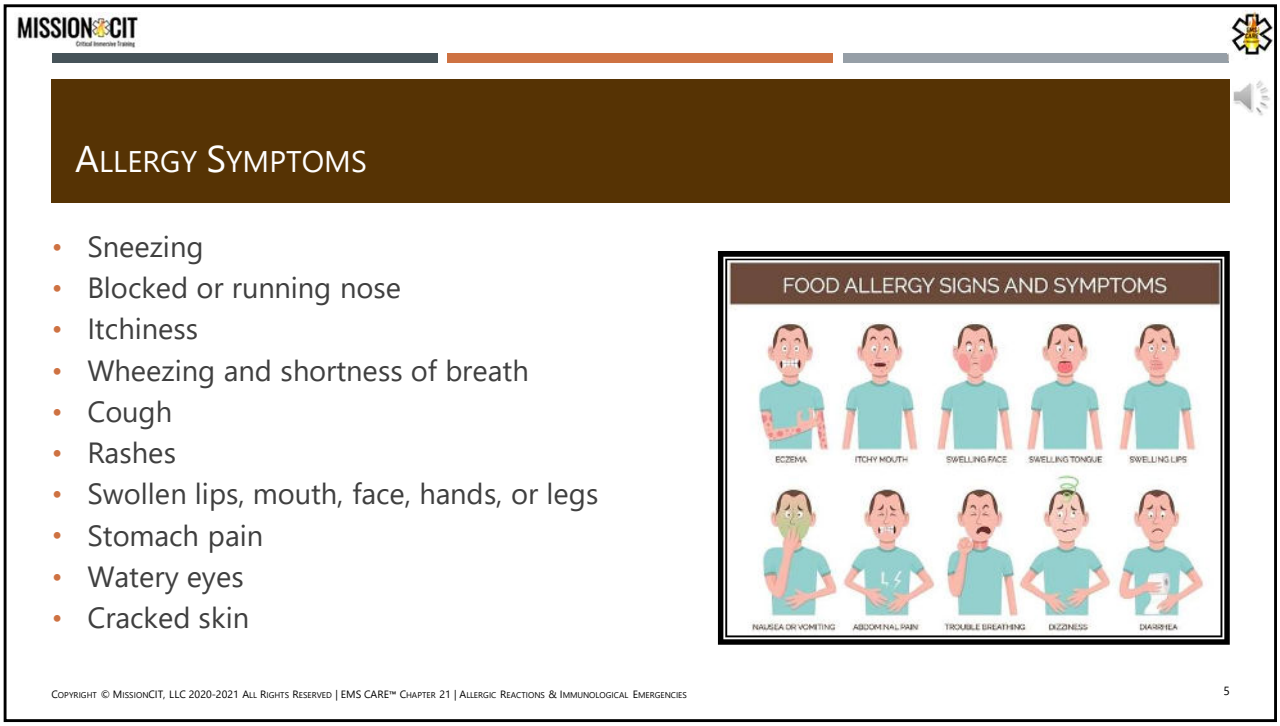
Increased capillary permeability is caused by proinflammatory mediators such as histamine and bradykinin. Or by structural damage to the capillaries due to burns and severe inflammation. When the capillary permeability is increased, proteins and other large molecules are lost in the interstitial fluid. This increases the blood flow to the tissue, leading to a

decrease in circulating blood volume. In turn, it leads to hypotension and shock, a major causative factor of Anaphylaxis.

This process where the blood flow to a particular area increases is called vasodilation. Essentially, the blood vessels in this area widen, especially those near the skin's surface. In turn, it decreases the systemic vascular resistance that causes a drop in blood pressure.

Next, bronchi are the pathways that facilitate the movement of air to and from the lungs. As the name suggests, bronchoconstriction is when these bronchi constrict, thereby reducing and restricting the movement of air passing to and from the lungs.

Another immunological response is increased mucus production by the cells in the nose, sinusitis, and lungs to eliminate the allergens. It is made up of water, salt, and proteins that trap germs and allergens. This mucus causes a runny nose or a post-nasal drip, leading to cough, sore throat, and a husky voice. Sometimes, this mucus changes color and becomes thick. This is more common among older people and can irritate the throat.



While the symptoms depend on the allergen, some broad signs that indicate an allergy are:

- Sneezing
- Blocked or running nose
- Itchiness
- Wheezing
- Shortness of breath
- Cough
- Rashes
- Swollen lips, mouth, face, legs, and hands
- Nausea and vomiting

- Stomach pain
- Watery eyes
- Cracked skin, and more.

Next, Missah will talk about these allergens and the possible symptoms in detail in the next lesson.