

ASTHMA

(CHAPTER 18.3)

QUESTION 1

Define asthma.

ásthma (labored breathing)

ASTHMA

"a **chronic inflammatory disease** of the airways of the lungs"

QUESTION 2

Describe some risk factors of asthma.

Asthma is a **multifactorial** disease, involving both genetic predisposition and environmental factors.

There is a strong **genetic component**; those with at least one parent with asthma are **3-6 times** more likely to develop asthma themselves.

Asthma is also more common in those with **respiratory allergies**, as these can trigger inflammation in those with predisposition for asthma.

QUESTION 3

Describe the pathophysiology of asthma.

Asthma consists of three basic pathophysiologic processes, all of which work together to inhibit airflow:

inflammation of the airways

hypersecretion of mucus

bronchoconstriction (or bronchospasm)

Inflammation of the airways can be acute, but often progresses to a chronic inflammatory state where the airways are partially constricted even at baseline.

This long-term inflammation can lead to **airway remodeling**, where structural changes such as fibrosis permanently alter the function of the airways.

The inflammatory process also leads to **hypersecretion** of mucus in the airways, with this excess fluid further contributing to respiratory obstruction.

These inflamed airways become **hypersensitive** to allergens, resulting in **bronchoconstriction** in which the smooth muscle around the airway constricts, further reducing the lumen and seriously obstructing airflow.

QUESTION 4

Describe the symptoms of asthma.

Dry cough, wheezing, shortness of breath—often worsened by exercise or by exposure to allergens, smoke, etc.

Can also present with other symptoms of allergies such as **allergic rhinitis**.

QUESTION 5

Why would flu vaccination be important for an asthma patient?

Asthma patients are at increased risk for developing **serious complications** of influenza.

Flu infections can trigger or worsen asthma, causing even more extensive narrowing of the airways.

Airway obstruction due to asthma can lead to the development of **pneumonia** during a flu infection.

QUESTION 6

Why would beta-adrenergic agonists be used in the treatment of asthma?

Smooth muscles of the airway are controlled by the **autonomic nervous system**.

The **parasympathetic** nervous system constricts the muscles of the airway, and the **sympathetic** nervous system relaxes them.

β -adrenergic agonists such as **albuterol** (short-acting) and **salmeterol** (long-acting) trigger the SNS, causing relaxation of the airway smooth muscle.

These drugs **work quickly**, and thus short-acting β -adrenergic agonists are commonly used in "rescue inhalers" for treating acute asthma attacks.

QUESTION 7

Why would inhaled anti-inflammatory drugs (corticosteroids) be used in the treatment of asthma?

Anti-inflammatory drugs are used in the management of patients with **persistent** (not intermittent) asthma.

Inhaled corticosteroids such as **fluticasone** can, over time, reduce the chronic airway inflammation associated with persistent asthma.

These drugs take effect gradually over the course of months, and are **not suitable** for treating acute asthma attacks.

QUESTION 8

Is asthma a restrictive or obstructive disease?

Asthma interferes with the flow of air **inside** the airways, making it an **obstructive** pulmonary disease.