No longer is asthma considered a condition with isolated, acute episodes of bronchospasm. Rather, asthma is now understood to be a chronic inflammatory disorder of the airways—that is, inflammation makes the airways chronically sensitive. When these hyper-responsive airways are irritated, airflow is limited, and attacks of coughing, wheezing, chest tightness, and breathing difficulty occur.

Asthma involves complex interactions among inflammatory cells, mediators, and the cells and tissues in the airways. The interactions result in airflow limitation from acute bronchoconstriction, swelling of the airway wall, increased mucus secretion, and airway remodeling. The inflammation also causes an increase in airway responsiveness. During an asthma attack, the patient attempts to compensate by breathing at a higher lung volume in order to keep the air flowing through the constricted airways, and the greater the airway limitation, the higher the lung volume must be to keep airways open. The morphologic changes that occur in asthma include bronchial infiltration by inflammatory cells. Key effector cells in the inflammatory response are the mast cells, T lymphocytes, and eosinophils. Mast cells and eosinophils are also significant participants in allergic responses, hence the similarities between allergic reactions and asthma attacks. Other changes include mucus plugging of the airways, interstitial edema, and microvascular leakage. Destruction of bronchial epithelium and thickening of the subbasement membrane is also characteristic. In addition, there may be hypertrophy and hyperplasia of airway smooth muscle, increase in goblet cell number, and enlargement of sub-mucous glands.

Although causes of the initial tendency toward inflammation in the airways of patients with asthma are not yet certain, to date the strongest identified risk factor is atopy. This inherited familial tendency to have allergic reactions includes increased sensitivity to allergens that are risk factors for developing asthma. Some of these allergens include domestic dust mites, animals with fur, cockroaches, pollens, and moulds. Additionally, asthma may be triggered by viral respiratory infections, especially in children. By avoiding these allergens and triggers, a person with asthma lowers his or her risk of irritating sensitive airways. A few avoidance techniques include: keeping the home clean and well ventilated, using an air conditioner in the summer months when pollen and mould counts are high, and getting an annual influenza vaccination. Of course, asthma sufferers should avoid tobacco smoke altogether. Smoke increases the risk of allergic sensitization in children, increases the severity of symptoms, and may be fatal in children who already have asthma. Many of the risk factors for developing asthma may also provoke asthma attacks, and people with asthma may have one or more triggers, which vary from individual to individual. The risk can be further reduced by taking medications that decrease airway inflammation. Most exacerbations can be prevented by the combination of avoiding triggers and taking anti-inflammatory medications. An exception is physical activity, which is a common trigger of exacerbations in asthma patients. However, asthma patients should not necessarily avoid all physical exertion, because some types of activity have been proven to reduce symptoms. Rather, they should work in conjunction with a doctor to design a proper training regimen, which includes the use of medication.

In order to diagnose asthma, the underlying disorder that leads to asthma symptoms must be appreciated so as to understand how to recognize the condition through information gathered from the patient's history, physical examination, measurements of lung function, and allergic status. Because asthma symptoms vary throughout the day, the respiratory system may appear normal during physical examination. Clinical signs are more likely to be present when a patient is experiencing symptoms; however, the absence of symptoms upon examination does not exclude the diagnosis of asthma.

1. According to the passage, what is the name for the familial inclination to have hypersensitivity to certain allergens?

a. interstitial edema

b. hyperplasia

c. hypertrophy

d. atopy

2. Why does a person suffering from an asthma attack attempt to inhale more air?

a. to prevent the loss of consciousness

b.to keep air flowing through shrunken air passageways

c. to prevent hyperplasia

d. to compensate for weakened mast cells, T lymphocytes, and eosinophils

3. The passage suggests that in the past, asthma was regarded as which of the following?

a. a result of the overuse of tobacco products

b. a hysterical condition

c. mysterious, unrelated attacks affecting the lungs

d. a chronic condition

4. Which of the following would be the best replacement for the underlined word *exacerbations* in this passage?

a. allergies

b. attacks

c. triggers

d. allergens

5. The passage mentions all of the following bodily changes during an asthma attack EXCEPT

a. severe cramping in the chest.

b. heavy breathing.

c. airways blocked by fluids.

d. constricted airways.

6. Although it is surprising, which of the following triggers is mentioned in the passage as possibly reducing the symptoms of asthma in some patients?

a. using a fan instead of an air conditioner in summer months

b. exposure to second-hand cigarette smoke

c. the love of a family pet

d. performing physical exercise

7. Why might a patient with asthma have an apparently normal respiratory system during an examination by a doctor?

A. Asthma symptoms are likely to regularly come and go.

B. Severe asthma occurs only after strenuous physical exertion.

C. Doctor's offices are smoke free and very clean.

D. The pollen and mould count may be low that day.

8. What is the reason given in this article for why passive smoke should be avoided by children?

A. A smoke-filled room is a breeding ground for viral respiratory infections.

B. Smoke can stunt an asthmatic child's growth.

C. Smoke can heighten the intensity of asthma symptoms.

D. Breathing smoke can lead to a fatal asthma attack.

9. Who might be the most logical audience for this passage?

A. researchers studying the respiratory system

B. healthcare professionals

C. a mother whose child has been diagnosed with asthma

D. an antismoking activist

10. Which of the following is a common symptom of chronic asthma?

A. Cyanosis

B. Hypoxemia

C. Wheezing

D. Nasal congestion