

Student name: Chanelle hay
Module code BMHP5023
Student number:2505019
Lecturer Name: Gillian weaver

Introduction to Physiology

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Introduction

Asthma is a long-term lung issue that often pops up or feels different once you hit 12 to 18 years old. You get recurring bouts of wheezing, a tight-feeling chest, being short of breath and that annoying, persistent cough. It is easy to write it off as just a bad cold, but it is not – the lining inside your airways stays swollen and sensitive, even on days when you feel okay (NHS UK, 2024).

Managing asthma can feel trickier through the teen years. Your body's changing fast with growth spurts and shifting hormones, and you start making more of your own decisions day-to-day. From what I have found reading, some young people notice their symptoms calm down over time, but for many others they happen more often or feel harder to deal with (British Thoracic Society, 2023).

There are a few things that make someone more likely to develop it, like having family members with allergies, regularly being around cigarette or vape smoke, poor local air quality, lots of repeated chest colds, and carrying extra weight. Things that trigger a flare-up vary per person; common ones are pollen, house dust, being active, strong scents, or stress from schoolwork and friendship worries.

In this report I will talk through how healthy lungs work normally, what changes when you have asthma, how it affects teenagers specifically, simple ways to keep track of symptoms, and small, realistic lifestyle changes that help. I will also touch on why a lot of teens skip their inhalers or struggle to stick to their plans. I just want to put together straightforward, useful information so both young people and health workers can manage asthma better day-to-day.

Section 1: Anatomy & Physiology

The respiratory system's main job is getting oxygen into the body and getting rid of carbon dioxide (the waste gas we breathe out). Air goes through the nose and mouth, down the windpipe (trachea), then splits into two main tubes going to each lung. These split repeatedly into tiny narrow tubes called bronchioles, ending in tiny little air sacs known as alveoli (Marieb & Hoehn, 2022).

Each small airway has a soft inner lining, a ring of stretchy muscle around it, and protective cells that react to dirt or germs. In healthy lungs, the muscle stays loose so air flows easily. When you breathe in, your chest expands and air fills the lungs; when you breathe out, everything relaxes and waste air comes out.

Inside the alveoli, oxygen moves through thin walls into the blood to travel around the body, while carbon dioxide moves back out to be breathed out. Oxygen helps turn food into the energy our bodies need to move, think, and grow – this energy is called ATP (Hall & Guyton, 2021).

Teenagers' lungs are still finishing their development. They grow quickly during spurts, but the inner lining of the airways is still delicate. In someone without asthma, the protective cells only react briefly to dust or a cold, then settle back down. Their airways do not tighten for no reason, so playing sport or being busy does not leave them gasping for breath.

Section 2: Pathophysiology & Impact

With asthma, the protective cells in the airways are over-sensitive. When a teenager breathes in something their body sees as an irritant – like vape fumes, pollen, or a cold virus – the defence system over-reacts (Global Initiative for Asthma [GINA], 2024).

Three things happen at once: the inner lining swells, extra sticky mucus is made, and the muscle around the bronchioles tightens up. This narrows the space for air to flow – that tightening is called bronchoconstriction, and it is what causes wheezing and chest tightness.

Teens are more at risk for extra problems. Changing hormones can make swelling in the airways less predictable. Many want to fit in with friends, so some skip their daily preventer inhaler or start vaping or smoking, which damages airway linings further (NICE, 2023). More colds and chest infections also make sensitive airways worse.

When air cannot flow well, less oxygen gets into the blood, and waste gas cannot leave easily. The body tries to fix it by breathing faster, which makes the chest feel tight. In a violent attack, not enough oxygen reaches the brain and muscles, leaving the young person tired, dizzy, or panicky.

If the swelling keeps happening over months and years, the airway walls slowly change shape – this is called airway remodelling (British Thoracic Society, 2023). Even when there is no obvious attack, breathing may never feel completely easy. Many teens avoid sport, trips or hanging out with friends because they worry about having an episode in public, which can knock their confidence and fitness levels.

Section 3: Monitoring & Data Use

Keeping track of symptoms helps spot trouble before a serious attack starts. Two simple tools are a peak flow meter and a symptom diary (NHS UK, 2024). A peak flow meter measures how fast you can blow air out of your lungs – everyone has their own “best” number when they feel well. If numbers keep dropping for a few days, it is a warning sign even before wheezing starts.

Some young people use phone apps to write down their peak flow readings and note what they were doing or what they were around when symptoms hit. This makes it easier to show patterns – for example that breathing gets harder in freezing weather, after running, or when stressed (GINA, 2024).

These notes help doctors and nurses adjust medication safely. They can tell the difference between one difficult day and a longer-term problem. Numbers are not everything though: some teens feel breathless even with normal readings, so how they feel is just as important.

Tracking also helps young people learn their own early warning signs, like a tickly night-time cough. The hardest part is remembering to do it – many think “I feel fine, so I don’t need to bother”. Health workers and family can help by suggesting quick, simple checks instead of long complicated routines.

Section 4: Evidence-Based Lifestyle Recommendations

Inhalers prescribed by a doctor are the main treatment, but small daily changes can lower airway swelling and make symptoms easier to manage. These ideas are backed by NICE (2023) and GINA (2024) and picked because they are realistic for teenagers.

First, stay away from known irritants. Vaping and smoking are harmful – chemicals in vapour damage the airway lining and make swelling worse. It helps to avoid places where people smoke or vape and not start using them yourself. At home, washing bedding regularly and keeping bedrooms less cluttered can cut down dust mites (British Thoracic Society, 2023).

Second, regular exercise is good – it is a myth that sport is bad for asthma. Walking, swimming, or cycling makes breathing muscles stronger and improves fitness. If exercise often triggers symptoms, a doctor may suggest one puff of the reliever inhaler about 15 minutes before starting activity (NICE, 2023).

Third, eating well and staying a healthy weight helps. Extra weight puts more pressure on the chest and can make swelling worse. Simple changes like drinking more water, eating more fruit and vegetables, and cutting back on sugary drinks work better than strict diets that are hard to keep up.

Fourth, stress and bad sleep make symptoms harder to control. Pressure from school or friendship worries can make airways more sensitive. Short daily walks, slow breathing exercise, and regular bedtimes can help (GINA, 2024).

These changes do not replace inhalers, but they lower ongoing swelling over time, so airways are less quick to tighten when triggers appear. Health workers should talk directly to the young person and agree on small steps they feel they can stick to.

Conclusion

This report has covered how healthy lungs work, what changes happen with asthma, why teenagers face extra challenges, how to track symptoms, and useful lifestyle changes. Asthma in teens is not just random wheezing – it is ongoing swelling in the airways that is affected by hormones, habits, and social life.

Understanding the basics shows why skipping preventer inhalers or vaping makes things worse. Regular simple checks help catch problems early, while small daily changes can cut how often bad episodes happen.

Health professionals need to speak to young people themselves, not just their parents. Many hide symptoms because they want to feel “normal”, so friendly, non-judgemental chats work better than long lists of rules.

There is no one-size-fits-all fixes. Finding personal triggers, sticking to agreed care plans, and making slow, steady changes helps teenagers with asthma stay active and join in with everyday life.

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