

Cystic fibrosis can impact many systems in your or your loved one's body

Cystic fibrosis (CF) disease progresses over time and may impact some people differently than it impacts others.

CF disease progression can occur when thick mucus builds up in the body, causing inflammation and scarring in multiple organs, resulting in permanent damage.

How CF can impact the body



Long-term impact on the lungs

Breathing problems are one of the most serious problems associated with CF. Beginning at an early age, the buildup of thick, sticky mucus in the lungs results in a cycle of infection, inflammation, and more mucus buildup. This cycle causes lung damage.

- From time to time, your CF symptoms may get worse or you may notice new symptoms. This could be a **pulmonary exacerbation** or flare-up caused by an infection in the lungs
- Inflammation causes the airways to stretch and get floppy. This is called **bronchiectasis**. It makes it harder to clear the airways of mucus and causes a change in breathing



Impact on the pancreas

The pancreas does two key jobs. It makes enzymes that break down the fats and proteins in food. It also makes hormones, such as insulin, which help regulate blood sugar levels. As CF progresses, the ability for the pancreas to do these jobs lessens.

Pancreatic insufficiency

- **Between 85 and 90 percent of people with CF have pancreatic insufficiency.** This means that digestive enzymes are getting stuck in thick mucus in the pancreas and can't make it into the small intestine. Without enzymes to break down food, much of the protein, fat, and carbohydrate in food is not absorbed for use in the body

CF-related diabetes (CFRD)

- CFRD is a form of diabetes that can occur in people with CF. People with CFRD do not make enough insulin, probably due to scarring caused by mucus buildup. People with CFRD also have some insulin resistance. CFRD is common in people with CF, especially as they get older



Impact on the digestive system

CF causes sticky mucus that may block ducts in the pancreas and stop enzymes from reaching the small intestine to digest food. Undigested food in the intestines can cause pain, cramping, gas, and either loose, greasy stools or constipation and blockages.



Impact on the sweat glands

People with CF tend to have salty sweat. There is 2 to 5 times more salt in the sweat of a person with CF. People with CF lose more salt than normal in their sweat, especially when exercising, spending time in the heat, or when they have a fever. This can lead to dehydration or heat stroke.



Impact on the sinuses and nasal passages

Thick, sticky mucus may block the sinuses and cause infections. People with CF can also get small, fleshy growths in the nose called *nasal polyps*. Nasal polyps do not always need treatment. However, if a polyp blocks the nose or causes problems, medicines or surgery might be needed.



Impact on the bones

People with CF are at risk of two common bone diseases: **osteopenia** and **osteoporosis**.

People with CF often have low mineral density, meaning bones don't have enough minerals that are needed to build strong bones. These minerals include calcium, phosphorus, magnesium, and fluoride.

- With osteopenia, bones do not have enough of these minerals, so they can become weak and less dense
- With osteoporosis, bones get brittle and fragile from loss of tissue

Both osteopenia and osteoporosis make bones more prone to break or fracture.

Bone disease is most common in the later teen and adult years for people with CF. Broken bones can affect lung health. A broken rib can make it much harder to breathe deeply and do airway clearance.



Impact on the reproductive system

In most males with CF, the vas deferens never developed normally before birth or thick mucus may block it. Sperm cannot pass. For women, thick sticky mucus makes it hard for sperm to travel and reach the egg so that fertilization can happen. Women may also ovulate less often and may have irregular periods.

Both men and women can have tests to check their fertility status.

CF affects everyone differently. Talk with your CF care team to learn how CF is impacting *your* body.

