# Cystic fibrosis

Cystic fibrosis (CF) is a hereditary condition that causes significant damage to the lungs, digestive system, and other organs.

Cystic fibrosis affects the cells that produce mucus, sweat, and digestive secretions. These generated fluids are often thin and slippery. However, in those with CF, a defective gene causes the secretions to become sticky and thick. Rather of acting as lubricants, the secretions block tubes, ducts, and channels, especially in the lungs and pancreas.

## Cause:

Cystic fibrosis is caused by a mutation in the CFTR gene (cystic fibrosis transmembrane conductance regulator). This gene regulates the flow of salt and fluids into and out of your cells. If the CFTR gene does not function correctly, a sticky mucus accumulates in your body.

To get CF, you have to inherit the mutated copy of the gene from both of your parents. Ninety percent of those with affected have at least one copy of the F508del mutation (webmd.com, 2019).

If you inherit only one copy, you won’t have any symptoms, but you will be a carrier of the disease. That means there’s a chance you could pass it to your children (webmd.com, 2019).

## Symptoms:

**Respiratory signs and symptoms (mayoclinic.org, 2020)**

Cystic fibrosis mucus is thick and sticky, and it clogs the passages that transport air in and out of your lungs. This might result in signs and symptoms like:

* A persistent cough with thick mucus (sputum)
* Wheezing
* Exercise intolerance
* Lung infections on a regular basis
* Stuffy nose or inflamed nasal passages
* Recurrent sinusitis

**Digestive signs and symptoms (mayoclinic.org, 2020)**

The thick mucus can also clog digestive enzyme tubes that go from your pancreas to your small intestine. Your intestines won't be able to absorb all of the nutrients in the food you consume if you don't have these digestive enzymes. Frequently, the end outcome is:

* Stools with a foul odour and a greasy texture
* Inadequate weight gain and growth
* Intestinal obstruction, especially in infants (meconium ileus)
* Constipation that is chronic or severe, with regular straining while attempting to pass stool, finally causing a portion of the rectum to protrude outside the anus (rectal prolapse)

## Treatments:

There are no known treatments for cystic fibrosis currently. Although there is no cure, there are a number of treatments that can help control symptoms, avoid, or lessen consequences, and make living with the disease easier. These include: (nhs.uk, 2021)

* Medicines for lung problems – antibiotics, anti-inflammatory medicines, bronchodilators, mucus thinners, CTFR modulators, and combination therapy.
* Exercise
* Airway clearance techniques
* Dietary and nutritional advice
* Lung transplant

Early detection implies earlier treatment and improved long-term health. Every state in the United States uses one or more of these three tests to screen neonates for cystic fibrosis: (webmd.com, 2019)

* A blood test is required - This test measures the amount of immunoreactive trypsinogen in the body (IRT). It is found in increased concentrations in the blood of people with CF.
* A DNA test is performed - This test checks for CFTR gene mutations.
* Sweat test - It measures the salt in your sweat. Higher than normal results suggest CF.

## Preventions:

It is impossible to prevent CF. Because CF is a hereditary illness, gene therapy at a young age would be the only method to prevent or cure it. Gene therapy might, in theory, correct or replace the faulty gene. Giving a person with CF the active form of a protein product that is sparse, or lacking is another therapy option (cdc.gov, 1995).

Couples with CF or relatives with the condition, on the other hand, should undergo genetic testing. By evaluating samples of blood or saliva from each parent, genetic testing can identify a child's risk of CF (mayoclinic, 2020).

Other options include: (Julie Lynn Marks, 2020)

* Drink lots of fluids to help thin out mucus
* Eat a healthy, well-balanced diet
* Stay up to date on vaccinations
* Exercise regularly
* Don’t smoke
* Practice good hand-washing techniques to prevent infection
* Keep all appointments with your healthcare team

# Tuberculosis

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis bacteria (MTB). Tuberculosis most commonly affects the lungs, but it can also affect other parts of the body. The majority of infections are asymptomatic, known as latent tuberculosis (TB), (NSW health, 2022).

Tuberculosis, along with HIV/AIDS and malaria, is one of the top three infectious diseases causing death in the world. Fortunately, Australia there is low incidence of tuberculosis (Newton, Joyce, Whan, 2020, p.95).

## Cause:

TB can be spread by a several number of things. These include: (NSW health, 2022).

* TB germs are spread through the air when someone with TB disease of the lungs or throat coughs, sneezes, or speaks, sending germs into the air
* When other people breathe in these germs, they can become infected
* Most people get TB germs from someone they spend a lot of time with, such as a family member or friend
* TB is not spread by household items (for example, cutlery, crockery, drinking glasses,

## Symptoms:

TB can affect any area of the body, although the lungs are the most commonly affected. Some patients with tuberculosis have just minor symptoms. Some or all of the following symptoms may be present in people with tuberculosis: (Healthdirect, 2021)

* Cough that has been bothering you for more than three weeks and isn't going away
* Sputum tinged with blood
* Fevers
* Sweats at night
* Weight loss that isn't explained
* Tired all of the time
* Appetite loss.
* Swelling and/or pain in the afflicted region.

## Treatments:

According to World Health Organisation, tuberculosis is curable and preventable. Those with TB disease will probably be treated with a variety of medications for a period of 6-12 months. The most common treatment for active TB is isoniazid INH in combination with three other drugs – rifampin, pyrazinamide, and ethambutol (lung.org, 2020).

## Preventions:

A few easy steps can help to limit the risk of TB illness.

* Adequate ventilation: tuberculosis may linger in the air for several hours if there is no ventilation
* Natural light: UV light destroys tuberculosis germs
* Excellent hygiene: when coughing or sneezing, covering the mouth and nose prevents the transmission of tuberculosis bacteria

Other options include (lung.org, 2020):

* Take your medicine exactly as the healthcare provider directed.
* Do not go to work or school until your healthcare provider says it's okay.
* Avoid close contact with anyone. Sleep in a bedroom alone.
* Air out your room often so the TB germs don't stay in the room and infect someone else.

# References

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