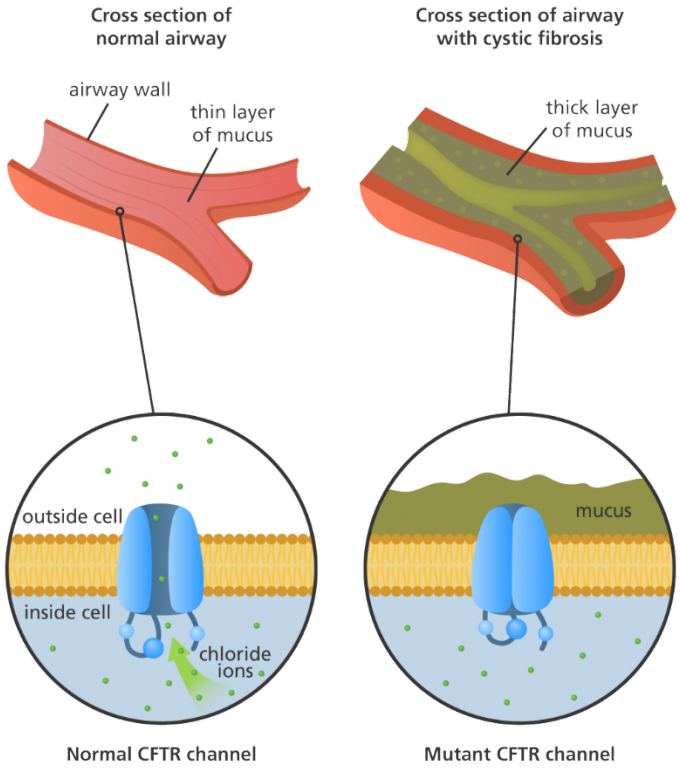
Cystic Fibrosis Protocol

Cystic Fibrosis (CF) is a multisystem genetic disorder that mainly affects the digestive and respiratory tract. The defective gene in CF causes the creation of thicker and stickier mucus that is difficult to remove/cough out of the lungs. This can lead to breathing difficulties and severe lung infections. The mucus can also interfere with pancreatic function by preventing the release of digestive enzymes from the pancreas that break down food. This can lead to malnutrition and poor growth in CF patients. Progressive lung disease is the major cause of death for most patients. Overtime, ranging from months to decades after birth, patients eventually develop a chronic infection in the respiratory tract with an array of bacterial flora, leading to progressive respiratory insufficiency and eventually respiratory failure. People with this life-threatening condition tend to have a shorter life span.



Patients with CF have abnormal transport of chloride and sodium across secretory epithelia which results in thickened secretions in the bronchi, biliary tract, pancreas, and intestines. This is due to the mutation in a single gene on chromosome 7 that encodes the cystic fibrosis transmembrane conductance regulator (CFTR) protein. Normally, CFTR regulates the transportation of chloride and sodium across the cell membrane. The transport of chloride ions from inside the cell to the cell surface helps attract water and thins the mucus. If the CFTR protein is dysfunctional the chloride ions are not allowed out of the mucus-producing cells to the surface and the mucus in various tubes, ducts and pathways will become thick and sticky which can obstruct those pathways. This obstructive process prevents bacteria from being cleared from the cells and can lead to infection. The types of complications in CF patients differ depending on the degree of mutation in the CFTR.

Many different types of bacterial pathogens colonize the lungs of patients with CF. *Staphylococcus aureus* (gram-positive) is usually the first pathogen to infect and colonize the airways leading to epithelial damage that then opens the way to other pathogens such as *Pseudomonas aeruginosa* (gram-negative).[1] P. *aeruginosa* has been shown to colonize in CF patients in more than 50% of cases and can survive for very long periods due to its ability to form biofilms.[1] Biofilm formation makes this bacterium difficult to treat with antibiotics. *Burkholderia cepacia*, a gram-negative bacterium found in the environment, can worsen lung disease in patients with CF.[2] It is not known how individuals with CF become infected with *B. cepacia* do not have a worsened lung condition while in other cases, *B. cepacia* can lead to a rapid decline in lung function and maybe death. *B. cepacia* can be passed from one individual with CF to another with CF, known as cross-infection. In the US, the 'six feet apart' rule exists stating that anyone with CF must stay at least six feet apart from another person with CF since more than just B. cepacia can be passed. Although in the UK, it is recommended that individuals with CF do not meet or spend time with each other. Nontuberculous mycobacteria (NTM) is another organism that can infect individuals with CF although the prevalence is much lower than those infected with *S. aureus* and *P. aeruginosa*. There is a stronger association between older individuals with CF and NTM. [3] NTM can cause progressive inflammatory lung disease however, NTM can also cause asymptomatic infections in CF patients.

The symptoms of CF are salty-tasting skin, persistent cough, shortness of breath, wheezing, hemoptysis, poor weight gain, bulky stools, and nasal polyps. Lung obstruction which creates optimal conditions for bacterial growth in CF increases the risk of lung infections such as pneumonia. Pancreas obstruction can lead to malnutrition and poor growth as well as osteoporosis.

Wellness Recommendation

The wellness recommendation for CF includes CL, Soup A, Soup B, and LC Balancer. CL removes lung Heat and helps to reduce mucus build up and clear lung inflammation and infection by gram-positive bacterium such as *S. aureus*. Herbal ingredients in CL have been shown to mitigate and improve airway rebuilding in the lungs by inhibiting the release of inflammatory mediators which helps delay the deterioration of lung function.[4] Soup A helps repair lung damage and facilitate new tissue growth through increasing the metabolic activities of tissue regeneration, known as Lung Yin nurturing in TCM. Soup A nurtures lung Yin and helps increase the biosynthesis of proteins, DNA and mRNA, etc. as well as the supply of building blocks including amino acid, carbohydrate and other cofactors necessary to speed up new tissue growth in the alveoli and bronchioles that were damaged from chronic lung infections. Soup B helps dissolve stasis or nodules and remove lung scars from the resting infection by triggering the necessary catabolic process and enhancing the body's endogenous enzymatic activities toward scar removal. LC Balancer nurtures kidney Yin and strengthens the microcapillaries to help open the vessels up to improve systematic microcirculation so that the herbal components, as well as nutrients, can be delivered to the individual alveoli and bronchioles. Enhanced microcirculation also helps clear up mucus and bronchial tube inflammation. Ginseng, an herbal ingredient in LC Balancer, has been shown to reduce the bacterial load of *P. aeruginosa* in the lungs as well as decreases the severity of lung pathology.[5] Patients should notice less phlegm and improvement in breathing in 2-4 weeks. A minimum of three months of the protocol is recommended to see significant improvement in their condition.

If the patient still has a high number of gram negative bacteria such as *P. aeruginosa* after three months of the above protocol, then CL-2 is recommended. CL-2 removes lung Damp Heat and helps to clear gram-negative infections from the lungs.

If the patient has symptoms of poor weight gain or pancreatic insufficiency, PA is required. PA removes heat and toxins from the pancreas. It helps clear inflammation caused by the excess mucus and infections in CF patients. Herbal ingredients in PA have been shown to inhibit the inflammatory pathway in pancreatitis, decrease oxidative stress, restore calcium regulatory mechanisms, increase pancreatic blood flow, and block bacterial translocation.[7]

If the patient has been diagnosed with a mycobacterial infection, CL, Jade, Java, and NewBase are also required to help clear the infection. CL helps clear inflammation and remove lung heat through decreasing inflammatory activities. Jade helps enhance Lung Qi to boost lung immunity. Herbal ingredients in Jade have been shown to have effects on lung immune function as well as improves the morphological changes of bronchus and lung tissue lesions.[6] Java remove Spleen Damp and helps improve lymphatic circulation and clear damp toxins to support the body in clearing the mycobacterial infection. NewBase helps remove kidney deficiency heat and improves adrenal function.

	Products
All CF Patients	CL, Soup A, Soup B, LC Balancer
CF Patients with High *P. aeruginosa* Levels	CL-2
CF Patients with GI Deficiencies due to Pancreatic Insufficiency	PA
CF Patients with Mycobacteria Infection	Jade, Java, NewBase, CL

References:

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