

Nutritional Support for Cystic Fibrosis

The global incidence of cystic fibrosis is estimated as 1/2500 live births. CF cannot be cured, but the symptoms can be managed to support overall health, to manage associated symptoms, and to increase the quality of life. CF is equally diagnosed in males and females, although males tend to have a higher life expectancy (approximately 40 years) in comparison with women (approximately 37 years). Progressive lung conditions or related problems are the primary cause of death in CF patients; therefore, intervention strategies are usually aimed at supporting respiratory health and increasing immune function against respiratory infections. A nutritional-based approach can effectively help to manage CF and associated symptoms to increase overall health and quality of life.

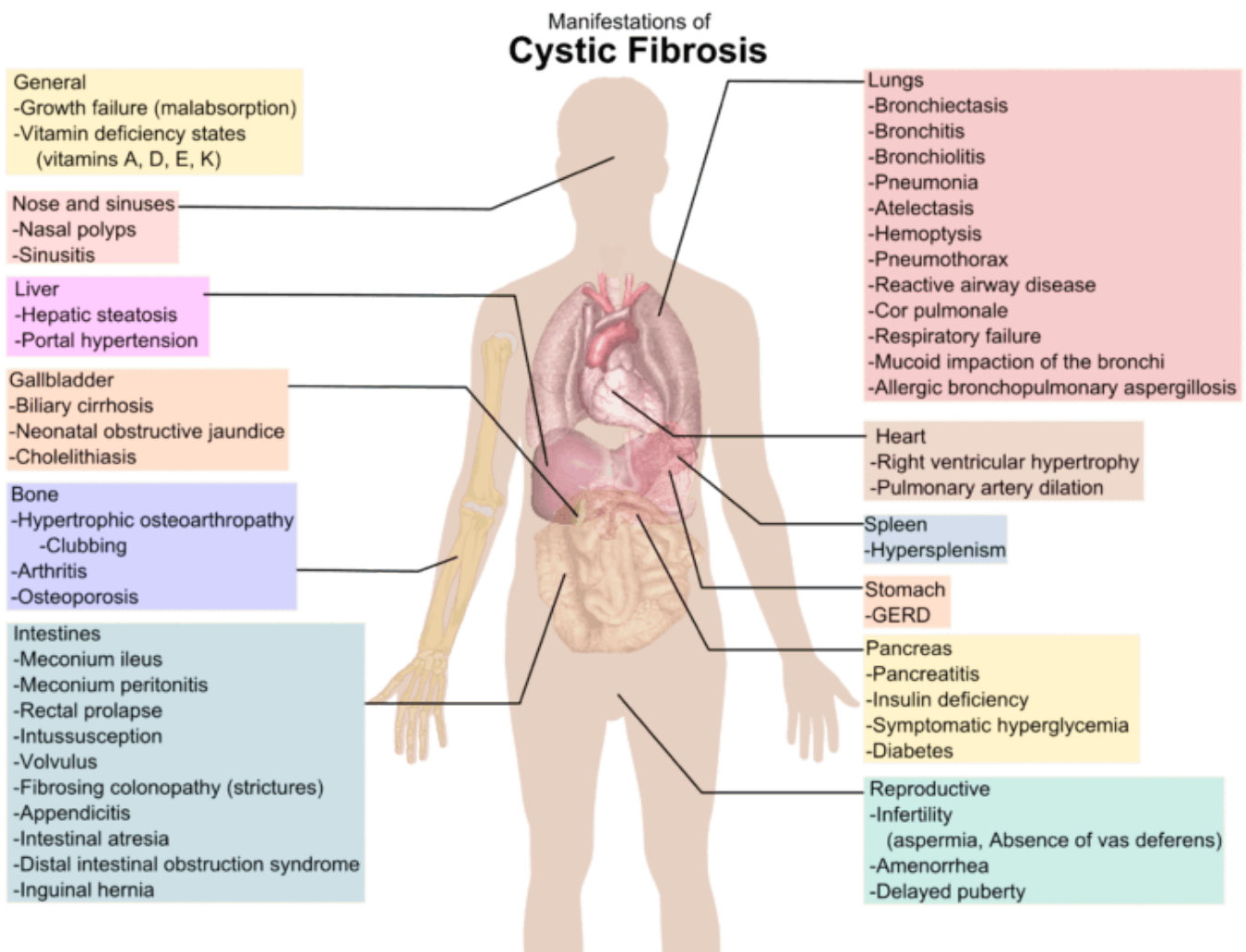
CF is caused by a mutation in the gene responsible for regulating the passage of salt in and out of exocrine glands. These glands produce and secrete substances onto epithelial surfaces of the body: sweat glands, salivary glands, reproductive glands, pancreas glands, and glands of the digestive and respiratory systems. If this gene is mutated, the protein influenced by it will be transformed and consequently stimulate the production of thick, sticky and abnormal mucus that may obstruct airways and damage tissues.

Each person inherits two copies of the gene related to CF, but CF is only possible if both parents have the mutated gene and passes it on to the child. If only one parent has the defective gene, their offspring will be a carrier of this gene and may pass it on to their children if their partner is also a carrier. A child with two carrier parents has a 25% chance of inheriting the disease and a 50% chance of being a carrier. The primary risk factor is both parents being carriers of the defective gene.

Every part of the body that presents with exocrine glands will be affected by CF: the pancreas, reproductive glands, digestive tract, salivary glands, sweat glands, and the respiratory tract.

Symptoms of CF

Symptoms of CF begin early in life and are often first seen in the respiratory tract or in the digestive tract.



Respiratory Tract

Thick, sticky mucus in the lungs and bronchial tubes may block lung passage and thereby promote the colonisation of harmful bacteria in the respiratory tract. Symptoms related to respiratory issues in CF patients include coughing, wheezing, difficulty breathing, and recurrent lung infections. The

bacteria may remain dormant in the lungs and contribute to repeated outbreaks of lung infections. These bacteria are often immune to conventional treatment and may contribute to tissue damage and may even suppress immune defences. Another primary characteristic of CF is chronic inflammation in the respiratory tract, which may consequently contribute to the formation of pro-oxidants, which are components that may damage and cause deterioration of tissues.

Digestive Tract

Thick secretions from the pancreatic gland may obstruct the secretion of digestive enzymes, which are required for digestion of food particles. Insufficient digestive enzymes may contribute to malabsorption and subsequently minimise nutrient stores in the body. Fat digestion and absorption are particularly affected by CF, leading to greasy and foul-smelling stools.

Other Common Symptoms

- Excessive and salty sweating
- Salty-tasting skin
- Infertility (reproductive organs are affected)
- Dehydration
- Chronic diarrhoea
- Poor growth
- Excessive appetite, but poor growth or low weight (due to malnutrition)
- Sinusitis

Conventional Approaches to CF

- Antibiotics are generally given to CF patients to manage chronic respiratory infections; however, antibiotics destroy both harmful and beneficial bacteria, which may in effect lower defences even further (beneficial

bacteria is critical for immune functioning).

- Anti-inflammatory medication (e.g.: ibuprofen) is often administered to reduce airway inflammation, which may effectively reduce inflammation, but it may also damage the gastrointestinal tract, which should be protected and strengthened as this tissue is already vulnerable in CF patients.
- Devices are used to remove mucus, to increase breathing, and to keep the airways open.
- Lung replacement surgery is often performed if lung conditions worsen or if lung tissue is excessively damaged.

A Nutritional Approach

Nutrition can help manage not only the symptoms of CF but the side-effects of treatment, as well.

Guidelines for Useful Supplements

- **Multivitamin and mineral supplement** – to ensure optimal nutrient stores. The highest quality sources of bio-available nutrients are plant- or food-derived multi-nutrient supplements. Malnutrition often exists alongside CF due to reduced digestive enzyme secretions and damage to the intestinal lining, which reduces capacity for absorption. Therefore, it is critical to ensure adequate nutrient intake through the diet and supplementation when needed to replenish nutrient stores in CF individuals.
- **Gastrointestinal supporting supplements** – 60-70% of the body's immune tissue is located in the gastrointestinal tract; therefore, if the gastrointestinal environment is sub-optimal or presents with an overgrowth of harmful bacteria, it may significantly reduce immune capacity. The abnormal mucus secreted in CF tends to damage the gastrointestinal tract, which may further reduce immune

function. Supporting gut health is a primary consideration for nutritional therapy intervention and includes the following strategies:

- **Probiotics:** Essential probiotics for the gut are *Lactobacillus acidophilus* and *Bifidobacterium lactis*. Dosage should preferably be 50 billion units per day.
- **Digestive enzymes:** As mentioned, the pancreatic secretions of digestive enzymes may be reduced, which significantly reduces the body's ability to digest and absorb foods. Providing digestive enzyme supplements alongside a meal ensures that these enzymes are present in the gut when food arrives that needs to be digested and absorbed.
- **L-Glutamine powder:** An amino acid that fuels the gut epithelial cells to repair any present damage and to protect against further deterioration to these intestinal cells. Dosage depends on age and progression of disease; suggested dosage is generally between 10g-50g per day.
- **Vitamins A, C, D and E:** Essential vitamins for immune functioning and maintaining gut epithelial tissue integrity. Dietary intake of these vitamins should be optimal, but a supplement form of these vitamins may be required for additional support. Vitamin C and E are powerful antioxidants to protect the body's cells and tissues against damage incurred by oxidants and inflammation. A high-quality multivitamin generally provides sufficient amounts of these vitamins, but the diet should also ensure a broad variety of fruit and vegetables to increase the intake of vitamins.
- **Essential fatty acids:** Omega 3 essential fatty acids (especially DHA and EPA) are powerful anti-inflammatory fatty acids and may, therefore, protect tissues against inflammatory damage. Essential fatty acid supplements should preferably be purified to minimise exposure to

heavy metals and toxins. Cod liver oil provides concentrated quantities of vitamin A, vitamin D, and essential fatty acids in a highly absorbable form.

- **Zinc:** A mineral that supports integrity and healing of tissues and provides immune support.
- **MSM (methylsulfonylmethane):** To protect lung tissue against damage and maintain strength and integrity of the respiratory tract.
- **N-acetyl cysteine:** A building block for glutathione production, a potent antioxidant required to protect cells against oxidant damage. Systemic glutathione levels are often deficient in CF individuals, especially in the epithelial lining. Glutathione has a therapeutic effect on lung tissue through the neutralisation of oxidants, reduction of inflammation, and resolving accumulated mucus.
- **Curcumin** (the main active ingredient in turmeric): Curcumin is one of nature's most potent anti-inflammatory and antioxidant agents. It may protect against lung inflammation and promotes optimal immune functioning. Curcumin assists in liver function and protects liver cells against damage. Optimal liver function is required to stimulate the secretion of digestive juices and bile acid production, which are both crucial for digestive functioning. A curcumin supplement should be combined with black pepper or in a highly absorbable form (usually indicated), because curcumin has a very low bio-availability and therefore needs assistance to be taken into circulation.

General Dietary Guidelines

CF often contributes to malnutrition, therefore, the diet is of paramount importance to ensure adequate intake of nutrients to support health, growth, and immune functioning. The diet should be mainly plant-based with a broad variety of fruits and vegetables to ensure adequate intake of all the essential

vitamins and minerals. Fruits and vegetables should preferably be organic to ensure a high nutrient profile, high antioxidant content, and a low exposure to toxins and pollutants.

As mentioned, sufficient intake of omega 3 may be effective in reducing inflammation, supporting immune function, and preventing mucus over-production. High-quality dietary sources of omega 3 include oily fish (especially salmon), flaxseed oil, and nuts (particularly walnuts).

Processed and heavily cooked foods stimulate mucus secretions and should, therefore, be avoided to prevent excessive build-up of thick, abnormal mucus. Foods should be easy to digest and if food intolerances are present, these foods should be eliminated completely to avoid an over-active immune system, excessive inflammatory responses, and increased mucus secretions.

Foods to Avoid

- Animal-derived foods are hard to digest, often contain a high amount of toxins, and are rich in saturated fats. Animal foods provide high amounts of arachidonic acid (AA), a fatty acid that is generally excessive in CF patients. Reducing the intake of animal-derived foods may keep AA levels in check, especially if the person supplements with a high-quality omega 3 supplement containing DHA and EPA.
- Dairy products stimulate mucus secretions.
- Processed foods, junk foods, processed meat, cheese, pre-packaged foods, etc.
- Refined starch such as white flour products (bread, pasta, pizza, pastries, etc.)
- Sugar

Foods to Include

- Animal protein alternatives include soaked nuts and

seeds (to increase nutrient absorption), beans, pulses, sprouts, high-quality protein powder and hemp powder (a high quality, high protein source). Nuts and seeds additionally provide essential fatty acids and vitamin E to reduce inflammation and provide antioxidant protection.

- Anti-inflammatory foods reduce inflammation in the respiratory tissues and prevent damage caused by inflammation. Anti-inflammatory foods include dark green leafy vegetables, avocados, oily fish, ginger, garlic, turmeric, and cinnamon.
- Foods that may reduce mucus formation and secretion include garlic, onions, parsley, celery, cranberry, and lemons / lemon juice.
- Pineapple and papaya provide natural digestive enzymes to support proper digestion and absorption of ingested foods. Include these fruit alongside meals to optimise nutrient stores.
- At least 10-12 glasses of water per day are required to ensure proper hydration of the body and to regulate fluid balances.
- Expectorant foods that may assist in relieving congestion and mucus build-up include cayenne pepper, garlic, turmeric, and hyssop.
- Immune-supporting herbs and food include eucalyptus, onions, ginger, garlic, tea tree oil, Echinacea, and thyme. Garlic, ginger, and onions also act as cellular antioxidants to protect against oxidant damage.

Blood Sugar Regulating Diet

Damage to the pancreas may often incur damage to the cells responsible for secreting insulin, thereby reducing the body's ability to regulate blood glucose levels. Carbohydrate intake should be restricted to prevent excessively elevated blood sugar levels, which may eventually manifest as insulin resistance or type 2 diabetes. Cinnamon can be used daily to

assist in blood sugar regulation. If insulin resistance or type 2 diabetes is already present, more specifically tailored dietary and supplement guidelines should be followed to manage blood sugar levels.

A therapeutic and powerfully anti-inflammatory drink to include daily is “Golden milk.”

Golden Milk Recipe

- 1 cup of full cream coconut milk
- 1 tsp turmeric powder
- $\frac{1}{2}$ tsp cinnamon
- 1 tsp raw honey
- a pinch black pepper (increases turmeric absorption)
- a tiny piece of fresh ginger
- a pinch of cayenne pepper powder

Blend the ingredients in a high-speed blender until it's properly mixed. Heat for 3-5 minutes over moderate heat in a saucepan and drink immediately.

Other Measures

Functional breathing techniques can also be very useful and effective to increase the capacity and flexibility of the respiratory tissue. An example of a functional breathing technique is 4-7-8 breathing:

- Inhale deeply through the nose for 4 seconds, taking the inhaled oxygen deeply into the diaphragm.
- Hold the breath for 7 seconds.
- Exhale deeply through the mouth for 8 seconds.
- Repeat at least 3 times.
- This exercise also calms the nervous system and can be quite effective to combat stress and anxiety.

For a more tailored, personalised approach, a nutritional therapist can develop an intervention program according to the

person's unique biochemical make-up and current state of health.

Related Reading:

- *Detox Cheap and Easy Without Fasting – Recipes Included*
- *Holistic Guide to Healing the Endocrine System and Balancing Our Hormones*
- *Candida, Gut Flora, Allergies, and Disease*
- *Gluten, Candida, Leaky Gut Syndrome, and Autoimmune Diseases*
- *Hypothyroidism – Natural Remedies, Causes, and How To Heal the Thyroid*
- *How To Detoxify and Heal From Vaccinations – For Adults and Children*

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