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## Micronutrients and Immunity

Micronutrients are vitamins and minerals needed by the body in order to perform everyday functions. They are vital to healthy development, disease prevention, well-being, and several other processes. Research suggests that getting an adequate amount of micronutrients in the diet can help boost the immune system to prevent and fight off illnesses.

**There are several key micronutrients that can help strengthen the immune system; these include:**

- **Vitamin C** – A vitamin found in various foods. It is an antioxidant that can help prevent or slow down certain types of cell damage. Vitamin C also promotes phagocytosis, or the action in which certain body cells “engulf” and get rid of germs or pathogens in the body. Vitamin C can be found in citrus fruits, berries, leafy greens, potatoes and tomatoes.
- **Vitamin D**- A vitamin with antibacterial, antiviral and anti-inflammatory properties. Research has shown sufficient vitamin D levels have been linked to lower risk of acute respiratory infection. Vitamin D can be found in oily fish (such as salmon, sardines, herring and mackerel), fortified milk and cereals, or be taken as a supplement. It is also produced naturally by the body when skin is exposed to the sun.
- **Vitamin E**- A vitamin that is also an antioxidant. Studies had shown sufficient levels of vitamin E can help improve immune function. Food sources that contain vitamin E include nuts, seeds, vegetable oils, leafy greens, and fortified cereals.
- **Zinc**- A mineral that plays a vital part in immune function. It helps with the development and activation of cells that fight infections. Food sources that contain zinc include meats, shellfish, legumes, nuts, dairy, and whole grains.

Please visit with your CF dietitian if you have questions or want more information on eating for immune health.

## Recipe Corner

### Raspberry Orange Smoothie (makes 2 servings)

¾ c frozen raspberries  
½ c orange juice  
½ c heavy cream  
¾ c whole milk or low-fat buttermilk  
3 Tbsp. oats  
1 Tbsp. honey  
Additional whole milk (optional, for thinning smoothie)

#### Directions:

1. Remove raspberries from the freezer and let them defrost for a few minutes
2. Place the orange juice, heavy cream, whole milk, or buttermilk, and oats in a blender (or in a bowl for a hand blender).
3. Add the raspberries and blend until creamy.
4. Top with 1 Tbsp. honey for a little extra sweetness.

### Nutritional Information (per serving)

Calories 275  
Fat 15g  
Carbohydrates 32g  
Protein 6 g

**Source:** Vertex's *Everyday-CF Magazine*. Please visit [EverydayCFKitchen.com](http://EverydayCFKitchen.com) for more recipe ideas.

## Basics of Lung Care

The lungs are a pair of organs in the body that are a part of the respiratory system. Their primary function is to perform gas exchange, or the process by which oxygen and carbon dioxide move between the bloodstream and the lungs. The process of gas exchange is impaired in people with Cystic Fibrosis due to thickened mucus forming in the lungs. The mucus blocks the airways, creating lung damage and making it hard to breathe. The damage caused to the lungs can greatly affect the health & well-being of people with Cystic Fibrosis. Fortunately there are several ways to monitor lung health and different kinds of treatments available to help keep the lungs as healthy as possible.

### Ways to monitor lung health:

- **Attending your quarterly visits with your CF Team-** Attending quarterly visits are encouraged to help monitor and catch infections early. Care teams work together with you to monitor all aspects of your physical and mental health. Your CF team will have you perform a series of tests and work with you to determine a treatment plan based on CF clinical care guidelines. This can help protect your lungs and prevent loss of lung function.
- **PFTs-** Starting at age 5 or older, your CF care team will ask you to take a type of breathing test, known as a pulmonary function test (PFT). A PFT is used to show how well the lungs are working. Your care center team will review your PFT results with you to help you understand what they mean.
- **FEV1-** Is the amount of air you can force from your lungs in one second. It's measured during a spirometry test, which is a type of PFT. A spirometry test involves forcefully breathing out into a mouthpiece connected to a spirometer machine. Your care team will work with you on ways to keep your FEV1 as high as possible.
- **Sputum Culture-** Your care team will ask for a sample of your sputum to test to see what kinds of bacteria are growing in your lungs. Based on results, your care team will determine which antibiotics might fight the bacteria. This is called a "sputum culture."

### Available treatments:

- **Airway Clearance-** Airway clearance techniques (ACTs) are a form of treatment that loosens up sticky mucus, which can then be cleared from the lungs by coughing or huffing. Clearing the airways can reduce lung infections and improve lung function as well as help keep your FEV1 numbers high.
- **Vest-** High-frequency chest wall oscillation involves an inflatable vest that is attached to a machine. The machine mechanically performs chest physical therapy by vibrating at a high frequency. The vest vibrates the chest to loosen and thin mucus.
- **Inhaled Medications and Nebulizers-** These medications open the airways and help move & thin the mucus so it can be coughed out. They include bronchodilators, hypertonic saline (7%), and Pulmozyme. Inhaled antibiotics should be taken after ACTs are finished. This will allow the medication to reach deeply into the smaller airways to attack the remaining bacteria.
- **Active Cycle of Breathing Technique (ACBT)-** Active cycle of breathing technique (ACBT) combines different breathing techniques that help clear mucus from the lungs in three phases. The first phase helps you relax your airways (Breathing Control). The second phase helps you to get air behind mucus and clear mucus (Chest Expansion Exercises). The third phase helps force the mucus out of your lungs (Huffing or huff coughing).
- **CFTR Modulator Therapies-** Cystic fibrosis transmembrane conductance regulator (CFTR) modulator therapies are designed to correct the malfunctioning protein made by the CFTR gene. Because different mutations cause different defects in the protein, the medications that have been developed so far are effective only in people with specific mutations.

## Important Dates:

### Cystic Fibrosis Clinic Dates

January 20, 2022  
February 17, 2022  
March 17, 2022

### Patient Advocacy Council Dates

January 13, 2022

36<sup>th</sup> North American Cystic Fibrosis Conference  
November 3rd- November 5th, 2022 in Philadelphia, PA  
More information is available at <https://www.nacconference.org/Home/>

### Your CF Team Members:

Dr. Monica Paulo  
Dr. Jane Gorud  
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