# Pandemic Plan for the Church

*Ministering to the Community in a Time of Crisis*

## What We've Learned from COVID-19

**Disclaimer: This is material is meant to informative and is not as medical advice. Please contact your doctor if you have these symptoms or any questions.**

Despite the better understanding of the pathophysiology of COVID-19, the search for new interventions remains ongoing. Scientists have taken to study medicines and molecules with anti-inflammatory and strong antioxidant potentials. This document is a summary of some of the over the counter (OTC) medicines that have been put into practice.

The National Institutes of Health (NIH) define a respiratory tract infection (RTI) as any infection disease of the upper or lower respiratory tract. Upper respiratory tract infections (URTIs) include the common cold, laryngitis, pharyngitis/tonsilitis, acute rhinitis, acute rhinosinusitis, and acute otitis media. Lower respiratory tract infections (LRTIs) include acute bronchitis, bronchiolitis, pneumonia and tracheitis.

Antibiotics are commonly prescribed for RTIs in adults and children in primary care.[i] However, these documents are addressing a time when the healthcare system may be overwhelmed, and access to a doctor who can prescribe antibiotics may be limited. This document is meant to discuss other ways to address the symptoms of a virus during a pandemic.

### Cytokine Storms

Cytokine storms are triggered in the pulmonary tissue by a hyper-activation of the immune system. It is defined as acute overproduction and uncontrolled release of pro-inflammatory markers, both locally and systemically. [ii] Both COVID-19 and the HPAI H5N1 cause cytokine storms.

It is this inflammation triggered by cytokines that causes the severe complication of acute respiratory distress syndrome (ARDS). This is an excessive immune response, not the amount of viral load. Management of this inflammatory response prevents subsequent infections such as pneumonia or damage to the organs.

The following are supplements and over the counter medications and proved to be helpful during COVID-19. Each includes scientific studies with evidence to back up the claims. Again, this is meant to be informative and is not meant to be medical advice.

## Vitamin D3 and Respiratory Health

Studies that have been performed through the COVID-19 outbreak have shed more light on respiratory health and even how to prevent serious symptoms. One such study was the use of Vitamin D and its effects on respiratory health. We have long known that sunlight can boost serotonin levels and improve mental health by increasing vitamin D production. Studies have shown that having low levels of vitamin D in your system may in fact increase the risk of severe COVID-19 symptoms, and even lengthen your recovery. [iii]

Vitamin D is a fat-soluble-vitamin, different from others in that a major source comes from the sun's UV light. Exposure to the sun allows your skin to convert vitamin D from cholesterol and is the best way to get vitamin D. Dietary sources include fortified foods and supplements. Studies have indicated that there is a high prevalence of vitamin D deficiency worldwide.[iv]

There is evidence that vitamin D may prevent or improve outcomes in many infectious and inflammatory conditions, including acute and chronic respiratory infections. There is also an increasing understanding of its immunomodulatory and anti-inflammatory functions. A recent study found a 70% reduction in viral respiratory tract infections among persons with vitamin D deficiency receiving vitamin D treatment.[v]

### Vitamin D and the Immune System and Inflammation

These studies have also found other benefits to Vitamin D while treating COVID-19. It has been found to boost your immune system and help control inflammation.

Dr. James Mullin of Lankenau Institute for Medical Research states:

> "The benefits, however, are so clear and the risks so minimal that we believe physicians should be recommending supplemental Vitamin D right away," Mullin said. "Cytokine storms, where the body's immune response kicks into overdrive and can result in severe disease and death in COVID, compromise the body's airway barrier function. We already know from past studies that Vitamin D blunts cytokine storms in cases of flu. In cases of COVID-19, vitamin D therapy may allow time for a patient's own immune defenses to kick in before it's too late."[vi]

### Recommended Dietary Allowances for Vitamin D

Many people are deficient, or don't get enough. This is especially true if you're older, don't eat healthy foods, or have a darker skin tone. And those low levels may raise your risk of severe COVID-19 if infected. [vii]

Currently, different recommendations exist. The Institute of Medicine has placed the recommended dietary allowance, or RDA, for vitamin D at 600 international units (IU) per day

for young adults and 800 IU per day for adults older than 70. Other experts suggest that adults' vitamin D needs are much higher. For example, the Endocrine Society recommends up to 1,500 to 2,000 IU of vitamin D daily for adults.

Mayo Clinic recommends that adults get at least the RDA of 600 IU. However, 1,000 to 2,000 IU per day of vitamin D from a supplement is generally safe, should help people achieve an adequate blood level of vitamin D, and may have additional health benefits.[viii]

Below is a table of recommended dietary allowances of Vitamin D from the National Institutes of Health[ix].

Recommended Dietary Allowances (RDAs) for Vitamin D

| Age | Male | Female | Pregnancy | Lactation |
|---|---|---|---|---|
| 0-12 months* | 10 mcg (400 IU) | 10 mcg (400 IU) | | |
| 1–13 years | 15 mcg (600 IU) | 15 mcg (600 IU) | | |
| 14–18 years | 15 mcg (600 IU) | 15 mcg (600 IU) | 15 mcg (600 IU) | 15 mcg (600 IU) |
| 19–50 years | 15 mcg (600 IU) | 15 mcg (600 IU) | 15 mcg (600 IU) | 15 mcg (600 IU) |
| 51–70 years | 15 mcg (600 IU) | 15 mcg (600 IU) | | |
| >70 years | 20 mcg (800 IU) | 20 mcg (800 IU) | | |

If you are not currently taking Vitamin D as a daily supplement, as a guard for your respiratory health, you start right away.

If you acquire a respiratory illness, COVID-19, or HPAI H5N1, some doctors have found a link between the disease and vitamin D deficiency. It has been determined that increasing supplementation either 5,000 to 10,000 IUs a day, (taken 5,000 IUs 2 times a day) to correct or prevent deficiency while someone is sick or admitted in the hospital.[x]

**How to Take Vitamin D**

Vitamin D is fat-soluble, meaning it does not dissolve in water, and is absorbed best when taken with high fat foods.

**How to get more vitamin D**

More sunlight and foods rich in vitamin D are the best ways. Exposure to sunlight for 15 to 10 minutes, three days a week is good source. Foods that are good sources of vitamin D are:

- Oily fish (like salmon, rainbow trout, tuna, sardines)
- Red meat
- Egg yolks
- Food with vitamin D added
- Raw mushrooms
- Fortified orange juice
- Fortified milk
- Almond milk
- Rice milk

## Antihistamines and COVID and Cytokines

Scientists who have been studying the pathophysiology of COVID-19 have found that the disease is a result of histamine activated pathways which can lead to a cytokine storm and acute respiratory distress syndrome (ARDS). There are four classes of histamine receptors H1, H2, H3, and H4, all of which play a role. Pathologically, histamine pathways can trigger inflammation responses such as ARDS, deep vein thrombosis, and damage to organs.

Of the histamine receptors, H1 and H2 have gained the most clinical attention. H1 inhibitor antihistamines should be included in symptom management, by modulating the histamine pathways and suppressing viral growth. One study by practicing pulmonologists states that starting treatment with antihistamines every 12 hours at the first symptoms (dexchlorpheniramine (Polaramine) 2 mg, cetirizine (Zyrtec) 10 mg or loratadine (Claritin) 10 mg) were recommended.[xi]

**Pepcid AC**

Recent studies of drugs such as Pepcid AC, also known as famotidine, which is a drug to treat gastrointestinal conditions, show COVID-19 symptoms were improved. The drug binds histamine H2 receptors that are present not only in the stomach but also in mast cells.[xii] Mast cells are responsible for releasing substances called mediators that results in inflammation. These mediators are chemicals such as histamines, that can cause an inflammatory cascade. By binding with the H2 receptors in mast cells, it reduces the release of certain proteins in the body causing inflammation.

In addition to inhibiting histamine release, it also reduces other inflammatory mediators which are responsible for the release of cytokines (molecules that allow communication between

cells). Thereby, Pepcid may improve symptoms by reducing histamine-induced cytokine release and inflammation.[xiii]

## Zinc

Zinc is an essential mineral that helps the body in many ways. According to the National Institutes of Health, it helps your immune system fight off invading bacteria and viruses. This supplement should be a part of your regimen when fighting off a virus 50 mg 2 times a day.[xiv]

It is necessary for the development and function of T cells in your immune system, which are responsible for fighting infections. It also plays a significant role in regulating cytokine expression and suppressing inflammation.[xv]

Zinc has been proven to have antiviral effects by reducing replication of the influenza virus. It also helps to inhibit the viral load. In cell culture studies, zinc has shown to inhibit the replication of the coronavirus causing severe acute respiratory syndrome. It's mechanism of inhibition is the inactivation of the RNA replication.[xvi]

Daily Recommended Zinc Intake:[xvii]

| Life Stage | Recommended Amount |
|---|---|
| Birth to 6 months | 2 mg |
| Infants 7–12 months | 3 mg |
| Children 1–3 years | 3 mg |
| Children 4–8 years | 5 mg |
| Children 9–13 years | 8 mg |
| Teen males 14–18 years | 11 mg |
| Teen females 14–18 years | 9 mg |
| Adult males | 11 mg |
| Adult females | 8 mg |
| Pregnant teens | 12 mg |
| Pregnant adults | 11 mg |
| Breastfeeding teens | 13 mg |
| Breastfeeding adults | 12 mg |

Zinc is safe at daily intakes up to 4 to 34 mg for infants and children, depending on age, and up to 40 mg for adults. Higher intakes can cause nausea, vomiting, loss of appetite, stomach cramps, diarrhea, and headaches.[xviii]
You may consider an increased daily amount of Zinc as high as 50 mg 2 times a day for a short duration while you are experiencing symptoms from COVID-19 or HPAI H5N1.[xix]

## Vitamin C

It has long been known that vitamin C is a powerful antioxidant. The effect of vitamin C on the immune system is complex. It has antiviral properties that are particularly beneficial when fighting a viral infection. It stimulates the production of interferon (block the replication of viruses) and enhances the antiviral activity of lung epithelial cells. It also possesses antioxidant and anti-inflammatory effects thus preventing hyperactivation of immune cells and decreasing inflammatory markers. All which lead to lowering the uncontrollable inflammatory cytokine production.[xx]

Be aware that vitamin C is water-soluble, which means that it dissolves in water and is not stored in the body. Serious side effects from too much vitamin C are rare. However, amounts greater than 2,000 mg a day are not recommended. High doses can lead to stomach upset, diarrhea, and can even cause kidney stones.

## Aspirin

The cascade of inflammatory mediators caused some people to develop blood clots with COVID-19. Because of this it is recommended to take 325 mg of aspirin everyday while experiencing symptoms to prevent blood clots.

Do not take aspirin if you experience the following:

- Allergy to ibuprofen
- Stomach ulcer
- Stroke victim (unless doctor recommended)
- High blood pressure
- Indigestion
- Asthma
- Gout
- Heavy periods
- Pregnant or trying to get pregnant
- Breastfeeding

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[xiii] Ibid.

[xiv] "Twice-Daily Oral Zinc in the Treatment of Patients With Coronavirus Disease 2019: A Randomized Double-Blind Controlled Trial", Saoussen Ben Abdalla, et al, National Library of Medicine, January 13, 2023, https://pubmed.ncbi.nlm.nih.gov/36367144/, accessed October 17, 2024.

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