What's Up Doc?

In California Wildfires, Climate and Health Collide
https://ysph.yale.edu/news-article/when-climate-and-health-collide/

"We are seeing cardiovascular events in people who don't even live close to the wildfires but are still exposed to the dangerous particulates carried by the smoke." the report's senior author and a leading cardiologist at Yale School of Medicine. Harlan Krumholz, MD.

This month we consider the impact of the Los Angeles fires which will be a concern that could be impacting Patients health in the decades to come. We also take a brief look at the Norovirus which is spreading rapidly.

The wildfires that ravaged the Los Angeles area have caused untold trauma, affecting hundreds of thousands of people. The Palisades and Eaton Fires, killed 28, consumed over 37,000 acres, and destroyed almost 16,000 structures, exposing thousands of people to hazardous smoke and ash.

Even smoke from "conventional" forest and wildland fires is a complex mix of water vapor, gases like carbon monoxide and nitrogen oxide, and volatile organic compounds such as formaldehyde. **A major issue is PM2.5,** which refers to particles that are 2.5 microns or smaller. These tiny particles are especially dangerous because they penetrate deep into the lungs and bloodstream. PM2.5 size is 28 times smaller than a human hair, easily inhalable, and hard to filter. PM2.5 when entering the lungs and bloodstream, cause heart and lung diseases. Lower PM2.5 levels mean healthier air; there is no safe exposure threshold to PM2.5.

Since the fires it is proving extremely difficult to obtain accurate levels of air pollution and length of time this pollution will remain a hazard. The Air Quality Index (AQI) only includes 5 PM2.5 pollutants ground level ozone, particle pollution, carbon monoxide, sulfur dioxide and nitrogen dioxide. It does not include many of the pollutants or toxins which are the result of burning buildings or cars such as lead or asbestos. There are reports of excessive lead content in the air being detected up to 150 miles from the area of the fires, however local agencies either do not have accurate information or if they do are unwilling to share the information apart from AQI reports. Comments that air quality is now returned or returning to normal are concerning.

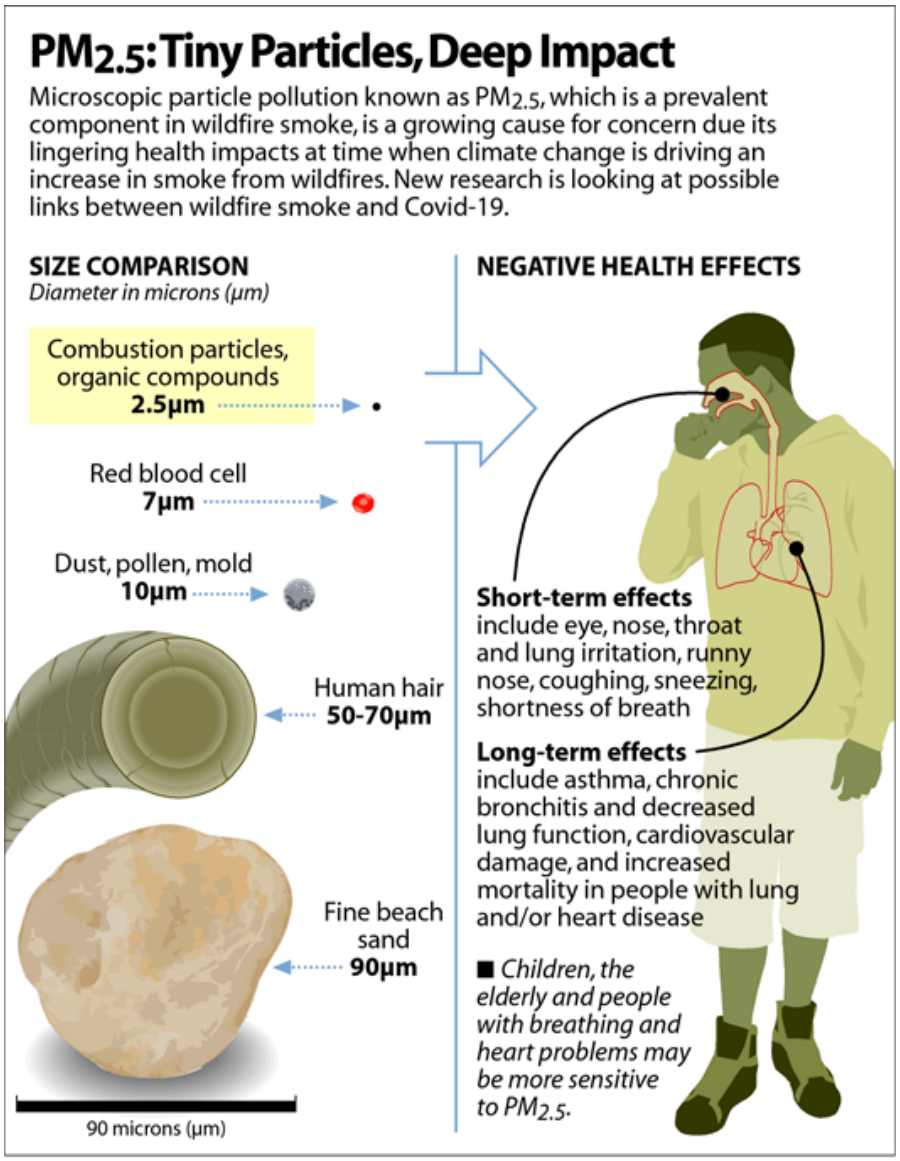
"It's very clear that when the PM2.5 concentration goes up, people die," says Anthony Wexler, director of the Air Quality Research Center at UC Davis. Spikes in PM2.5 concentration are consistently followed by an uptick in hospitalizations and cardiovascular-related deaths like heart attacks and strokes. This is true regardless of the source of the pollution, says Wexler.

The following Yale study in response to the recent uptrend in wildfires.

Long-term exposure to wildfire smoke associated with higher risk of death

https://ysph.yale.edu/news-article/long-term-exposure-to-wildfire-smoke-associated-with-higher-risk-of-death/

"Of the deaths associated with long-term exposure to PM2.5, approximately 72.5% were from cardiovascular diseases, mental disorders, endocrine diseases, and digestive diseases" according to the study. The data also revealed greater increases in mortality rates among older adults exposed to PM2.5 than has been reported in previous studies.



PM2.5 can be deposited in the kidneys, contributing to kidney diseases, the researchers said. Endocrine disease deaths associated with PM2.5 exposure were ranked second highest in the study with about 1,142 deaths per year. Chronic kidney disease deaths were estimated to be 320 per year. PM2.5 exposure has also been associated with insulin resistance, which may lead to diabetes and other endocrine diseases.

"These fine particles can penetrate the respiratory tract and bloodstream, triggering oxidative stress and inflammation, which can impair lung and vascular function," said Dr. Yiqun Ma, PhD '24, first author and now a postdoctoral fellow at Scripps Institution of Oceanography. "Additionally, PM2.5 can enter the gastrointestinal tract, causing imbalances in the intestinal microecology."

Mental health is also affected through oxidative stress, neuroinflammation, and dysregulation. This has been linked to psychological diseases and aggravation of physical health conditions, which can lead to mental health issues

A summary of the primary concerns:

1. **Respiratory Issues**

The combustion of synthetic materials, plastics, and industrial chemicals releases **particulate matter (PM2.5 and PM10)**, which can penetrate deep into the lungs and cause **chronic respiratory diseases, asthma exacerbations, and reduced lung function**.

Volatile organic compounds (VOCs) such as benzene and formaldehyde contribute to **long-term lung damage and increased cancer risks**.

Individuals with pre-existing lung conditions (COPD, asthma) are at **greater risk of hospitalizations** due to persistent air pollution.

2. Cardiovascular Effects

Fine particulate matter and toxic gases, including **carbon monoxide (CO) and nitrogen dioxide (NO2)**, lead to **increased blood pressure, arrhythmias, and a higher risk of heart attacks** in vulnerable populations.

3 Neurological and Cognitive Concerns

Prolonged exposure to neurotoxic chemicals such as **lead, mercury, and dioxins** leads to **cognitive decline, developmental issues in children, and neurodegenerative diseases**.

4. Carcinogenic Risks

The Palisades and Eaton fires burnt industrial materials, **plastics, and heavy metals**, releasing carcinogenic compounds such as **dioxins, polycyclic aromatic hydrocarbons (PAHs), and asbestos fibers**.

Long-term exposure to these toxins is linked to lung cancer, leukemia, and other malignancies.

5. Water and Soil Contamination

Toxic runoff from burned structures can lead to **contaminated water supplies**, exposing communities to **lead, arsenic, and other heavy metals**.

Food sources could be affected, especially if agricultural land is contaminated with persistent organic pollutants (POPs).

6. Mental Health

Air pollution has also been linked to **increased rates of depression and cognitive impairment** over time.

Wildfire survivors often experience **chronic stress, anxiety, and PTSD** due to displacement and long-term health concerns.

Immediate to Short-Term Risks (Days to Weeks):

Respiratory and Cardiovascular Effects: Exposure to fine particulate matter (PM2.5) from wildfire smoke can cause immediate health issues such as eye and respiratory tract irritation, exacerbation of asthma, bronchitis, and increased risk of heart attacks and strokes.

Medium-Term Risks (Weeks to Months):

Persistent Respiratory Symptoms: Some individuals may experience prolonged respiratory symptoms, including coughing, wheezing, and shortness of breath, especially those with pre-existing conditions like asthma or chronic obstructive pulmonary disease (COPD).

Mental Health Impacts: The stress and anxiety associated with wildfires and exposure to smoke can lead to mental health challenges, which may persist for months after the event.

Long-Term Risks (Months to Years):

Chronic Health Conditions: Long-term exposure to pollutants from wildfire smoke has been associated with an increased risk of developing chronic diseases. A study found that prolonged exposure to PM2.5 from wildfire smoke is linked to higher mortality rates due to cardiovascular diseases, mental disorders, endocrine diseases, and digestive diseases.

Lung Function Decline: Research shows that individuals exposed to wildfire smoke experience decreased lung function even a decade after exposure.

Individual Factors

Vulnerable Populations: Children, the elderly, pregnant individuals, and those with pre-existing health conditions may experience prolonged health effects and require more extended recovery periods.

SUPPORT

The first study is a review of more 4600 records within PubMed and Clincaltrials.gov up to March 2023 From this the data from 18 studies was used to create the review. The second study is a Chinese study specific to wildfires and fish oil supplementation

Reference: Dietary supplementations to mitigate the cardiopulmonary effects of air pollution toxicity: A systematic review of clinical trials PMID: 38870164

Cardiovascular Benefits of Fish-Oil Supplementation Against Fine Particulate Air Pollution in China https://www.jacc.org/doi/abs/10.1016/j.jacc.2018.12.093

Air pollution, oxidative stress and dietary supplementation: a review
https://publications.ersnet.org/content/erj/31/1/179

Based on the studies here are the key supplements

1. Omega-3 Fatty Acids (Fish Oil):

Benefits: Omega-3s have been shown to reduce inflammation and oxidative stress caused by air pollutants. Studies suggest that supplementation can protect against pollution-induced vascular damage and improve heart rate variability.

2.Vitamins C and E:

Benefits: These antioxidants can neutralize free radicals generated by pollutant exposure. Combined supplementation has been linked to improved lung function and reduced airway inflammation in individuals exposed to high levels of air pollutants.

3. B Vitamins:

Benefits: B vitamins, particularly B6, B12, and folic acid, may mitigate the adverse cardiovascular effects of fine particulate matter (PM2.5) exposure by modulating inflammatory and epigenetic responses.

4. . Zinc

Benefits: Zinc reduces harmful inflammation during disease states. increase T helper cell counts. significantly improved immune function. A decrease in incidences of infections and oxidative stress markers. A decreased duration of pneumonia

Doctors Research Products

Detox & Cleanse This is a key component of the Two-Week Turnaround program and assists the body in removing heavy metals and pesticides, in addition to supporting cellular and colon health. I would suggest a **dose 1-3 per day ongoing**

Simply Parotid. The Parotid glands are the bodies first line of defense for anything entering the body orally. Simply Parotid acts as a natural chelator by cleaning chemicals out of the arteries. Secondly it help's your body tag poisons and loosen the bonds between the chemicals and your body's tissues. Slusarski R. ADDICTION SOLUTIONS IN ANGOLA IN, Tri-State Healing Center. https://www.tristatehealing.com **Dose at 1-3 per day**

Intracellular Cough soon to be renamed **Intracellular Defense.** Offering organ support at a cellular level. Intracellular defense supports a healthy trachea, enhances immune function. Supports the lymphatic system. This product is key to maintaining cellular health and supporting any organs compromised by the insults of chemicals and heavy metals. **Dose 1-3 per day**

Omega 3 EPA/DHA. Mentioned in all the studies to reduce inflammation and oxidative stress. Doctors Research Omega 3 EPA/DHA is sourced from wild Herring fish are less likely to contain heavy metals than Tuna each batch is of course tested. It is also the Triglyceride bio available form of fish oil not the Ethel Ester form. In tests of 1000mg of Ethel Ester EPA it was found only 27mg of EPA was utilized. Be wary of high dose Omega 3's this is label marketing the Ethel Ester form of Omega 3 has only one benefit over the triglyceride form of Omega 3 it is cheaper to manufacture.

Interestingly a recent study involved the Hospital del Mar Medical Research Institute (IMIM) in Barcelona, Spain, and the Fatty Acid Research Institute (FARI) in Sioux Falls, SD.
The researchers' goal was to find out what role omega-3 plays in life expectancy. They tracked 2,240 participants over 11 years and analyzed omega-3 levels in the participants' blood.
"Having higher levels of these acids in the blood, as a result of regularly including oily fish in the diet, increases life expectancy by almost 5 years."
Dose at 3 per Day until levels of 8% -12% are achieved (see rep for blood spot test)

Vitamin B-6, B-12 & Folate The 3 B Vitamins shown in studies to support the body from the aftereffects of wildfires. Our B Stress Complex does also include B6,B12 and folate (B9) in the food form. Vitamin B6,helps digest nutrients, create blood cells, and produce signals to allow our brains to function properly. Low levels of vitamin B6 may lead to confusion or depression, a weakened immune system, and anemia**. B12** helps create new red blood cells, breaks down fats and proteins to be used for energy, and maintains brain function. Deficiency is linked to permanent nerve and brain damage and causes depression or confusion. Folate (B9) contributes to cell growth, the production of DNA and red blood cells. Lack of folate can be responsible for anemia and fatigue; it is vital for fetal development.

This product is key with Hematic Formula for anemia and essential during Pregnancy.

Note this is Folate (the food) not Folic acid. It is also the methylated form of B12 there are few if any food forms of this product do not be misled by marketing.
Dose at 1 -3 Per Day

Additionally support known existing concerns such as Heart or lungs

RECOMMENDATIONS

Run HVAC systems with high-efficiency filters (MERV 13 or higher) to reduce indoor pollution.

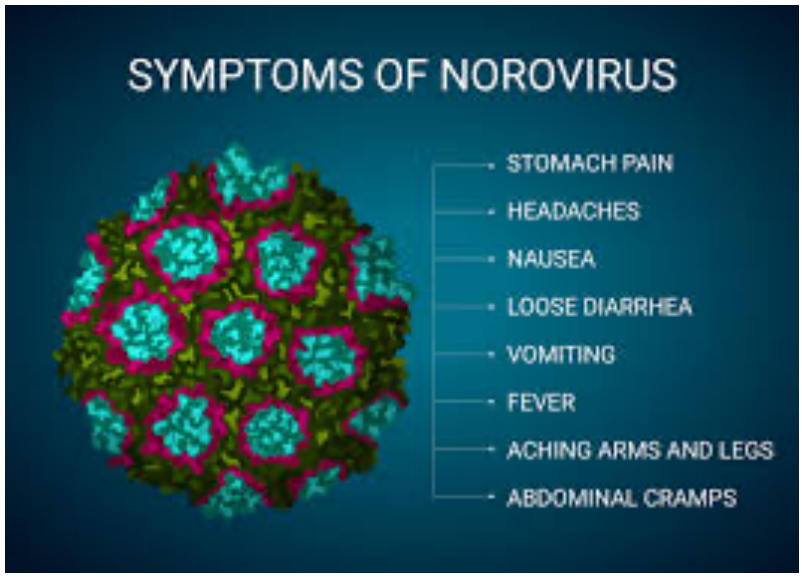
While I was not a fan of masks during COVID this maybe the time to consider one

Limit outdoor exercising

As mentioned above consider vulnerable populations such as pregnant woman children the elderly and those with pre-existing conditions

Recommend **Detox & Cleanse** and **Intracellular Defence** to all Patients. Add supplements to support vulnerabilities such as heart or lung issues

Norovirus



Some Patients may have already contracted Norovirus, others may well in the near future.
Norovirus is a highly contagious, non-enveloped, single-stranded RNA virus that causes acute gastroenteritis. It is the leading cause of foodborne illness worldwide and is responsible for both sporadic cases and outbreaks in healthcare settings, cruise ships, schools, and long-term care facilities. The virus primarily spreads via the fecal-oral route, through contaminated food, water, surfaces, and person-to-person contact. It is currently spreading across the US and prevalent in CA. Norovirus has an Incubation Period of 12–48 hours. Common symptoms include vomiting and diarrhea, nausea, abdominal cramps, low grade fever, headaches and myalgia.
Symptoms usually resolve themselves within 24–72 hours, but viral shedding can continue for some weeks afterwards.
Norovirus is a non-enveloped virus it infects enterocytes in the small intestine which leads to malabsorption and increased intestinal permeability. This causes immune activation and cytokine release, leading to inflammation and secretory diarrhea.

SUPPORT

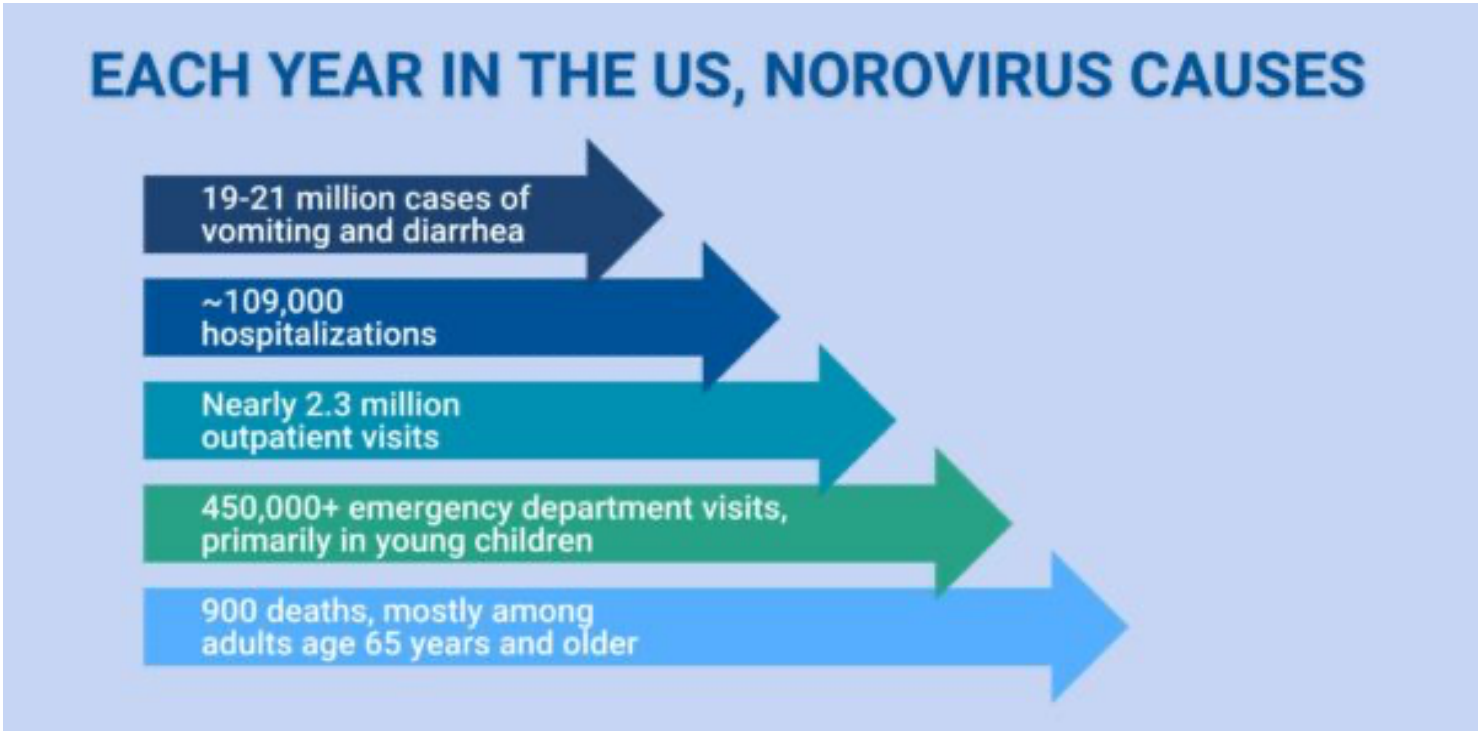
1. Vitamin D
Modulates immune response, enhances antimicrobial peptides, and strengthens gut barrier function.

A study in *Scientific Reports* (2021) found that higher vitamin D levels were associated with a lower risk of gastrointestinal infections.
Another study in *Nutrients* (2020) reported that vitamin D deficiency increased susceptibility to viral gastroenteritis.
Dosage: 2,000–5,000 IU/day for immune support.

2. Zinc
Enhances immune function, supports gut integrity, and has direct antiviral properties.
A systematic review in *The American Journal of Tropical Medicine and Hygiene* (2016) found that zinc supplementation reduced the severity and duration of diarrhea in viral gastroenteritis.
Zinc inhibits viral replication and boosts mucosal immunity.
Dosage: 10–20 mg/day prophylactically; up to 40 mg/day during infection.

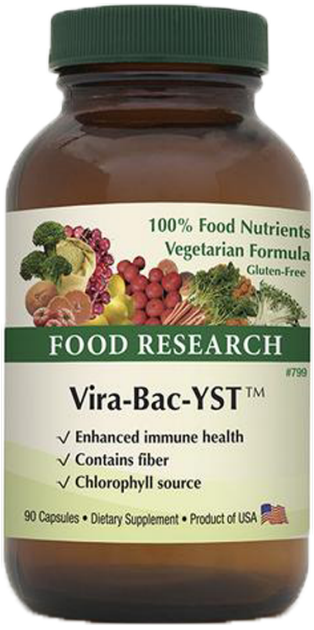
3. Probiotics
Modulate the gut microbiota, enhance mucosal immunity, and compete with pathogens.
The Cochrane Database of Systematic Reviews (2016) found that *Saccharomyces boulardii* reduced the duration and severity of acute diarrhea, including viral causes.
Dosage: 5–10 billion CFUs/day prophylactically; 10–20 billion CFUs during active infection.

Vitamin C
Supports immune cell function and has antioxidant properties.
A study in *Nutrients* (2019) suggested that vitamin C supplementation may enhance resistance to viral infections.
Antioxidant effects may help mitigate oxidative stress caused by norovirus.
Dosage: 500–1,000 mg/day.



Doctors Research Products

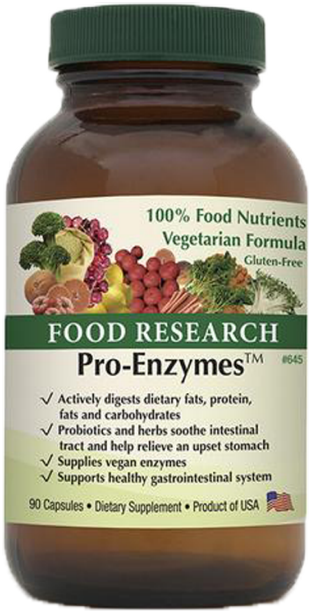
Conga-Immune. Includes Vitamin C, Zinc, Echinacea Purpurea Root and Shitake Mushrooms to support the Immune System and offers support of the throat and Thymus gland.
Dose at 3 per day through cold and flu season.



Vira-Bac-YST. an excellent vegetarian and gluten free product comprised of Buckwheat leaf, Olive leaf, Organic Beet root and Oregano. This product supports both immune and digestive health and contains fiber.
Dose at 3 per day up to 12 per day if Norovirus is contracted. I have had personal experience and success with this at 12 per day reducing the length and symptoms of Noro Virus.

Probio-Zyme-YST. A probiotic and more, contains prebiotics to support and feed Probiotics. Probio-Zyme-YST also includes a selection of herbs such as Oregano Olive leaf and Artichoke leaf to maintain and restore intestinal flora and gut pH.
Dose at 3 per day up to 12 per day during illness

Pro-Enzymes. In addition to containing the Probiotic Lactobacillus Acidophilus, Pro Enzymes contains Beetroot Ginger and Pumpkin seeds to ease nausea sooth the gut and help it to heal. Gentian Root is included for its anti-microbial properties.
Enzymes will help restore balance and healing and aid digestion as the gut starts to repair
Dose at 3 to 6 per day as symptoms start to ease Pro-Enzymes will help greatly to sooth the gut and aid digestion



D Complex. Vitamin D at 5000IU's of D3 should be on everyone's supplement agenda. This is as simple as one capsule per day of Doctors Research (DR) D Complex. In addition to supporting the immune system Vitamin D enhances antimicrobial peptides and supports the function of our gut barrier. At 5000IU of D3 per capsule D Complex also contains 380mg of D2 sourced from Shitake mushrooms recent studies have shown D2 to support the Immune system. D Complex is a **100% food** supplement and vegetarian
Dose at 1 per day. If vitamin D levels are low Dose at 3 to 6 per day until sufficient then maintain at 1 per day.

Always include Vitamin & Mineral at 2 -3 per day