HOW TO STRENGTHEN YOUR INNER SHIELD

Science-Based, Integrative Strategies for a Healthy Immune System During a Pandemic

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Introduction

The 2 Shields

To combat the COVID-19 outbreak, the media has focused almost exclusively on the outer shield. That is, minimizing spread. This includes physical distancing. Washing hands with soap and water for 20 seconds. Alcohol sanitizers. Disinfecting tabletops and door knobs. Wearing disposable masks and gloves.

This is the first line of defense. And it is vital.

But there’s a second, equally important and often overlooked line of defense: the inner shield. That is, your immune system. The primary difference between a mild illness with COVID-19 and a severe one requiring hospitalization is the strength of this shield.  

The immune system is the microscopic army that stands guard just under the surface of your mouth, nose, lungs, skin, and gut. In addition, there’s an intricate network of stations throughout the body where more troops are keeping the peace, and awaiting orders to mobilize against an invasion.

A strong inner shield translates to resilience—the capacity to bounce back, to restore balance and wellbeing whether you’re faced with an acute infection or not. This shield can always be strengthened, no matter your current health status. And when you do strengthen it, you’re potentially treating an infection more effectively—if you already have one—and also preventing or reducing the chances of future ones. Strengthening the immune system is primarily done by giving your immune system what it needs to function optimally, and regulating the stress response.

Everybody Wins

This booklet offers some strategies for strengthening the inner shield. They may seem simple. But simple doesn’t always mean easy. You will be asked to pause, take notice of your environment, and, perhaps most challenging, care for yourself. Also included are a list of supplements. Taken together, these strategies can restore a sense of agency. By participating in your life instead of just retreating, you can help reduce one of the greatest insults to any infection: fear.

When you employ both shields, you’re helping everyone: yourself, your family, community, nation and—in this period of a pandemic—the world. You’re freeing up scarce health care resources for those in need, and maintaining good health to serve those around you. Everybody wins.

So take note. And take heart.

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1 https://www.sciencedaily.com/releases/2020/03/200317103815.htm
1. **Nourish Yourself.**

Food. And Supplements. But Mostly Food.

What we eat—and what we choose to eliminate from our diets—can impact immune function. Our food choices also impact anxiety levels and stress, both of which can impair the inner shield. One sure way to begin fortifying the shield is to nourish yourself with real food. This time when many of us are “sheltering in place” may be an opportune time to get reacquainted with the enjoyments of cooking.

There is no single perfect diet that suits everyone. But most experts agree on the following:

- Eat whole foods.
- Minimize processed foods.
  - Aim for 5-8 servings a day of rainbow-colored vegetables, and 3-5 servings of fruit.
- Include nuts and seeds. Walnuts. Cashews. Flaxseeds.
- If you eat meat, don’t forget oily fish. Salmon (best if wild). Mackerel. Sardines.
- Choose organic when feasible and available.
- The more you can cook from scratch, the better. It doesn’t have to be fancy. Salt and pepper go a long way.

Here’s a great free resource by Chef Leanne Brown on eating/cooking for less than $4 a day: https://books.leanne-brown.com/good-and-cheap.pdf

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2. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6723551/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6723551/)
Power foods for a one-two punch

- **Apples.** Their skin contains a compound called quercetin, which helps regulate the immune system. Apples are also a great source of fiber, which good for the gut (which plays a bigger role in immune function than you might realize).

- **Onions.** They're high in immune-supporting minerals like selenium and zinc. The sulfur helps detoxify the body.

- **Lemons.** High in antioxidants, especially vitamin C, you can drink this down as lemon water with your favorite meal. Better yet, first thing in the morning.

- **Garlic.** They contain a compound called allicin, which may directly fight off infections.

- **Bone broths.** These mineral- and gelatin-rich broths are packed with amino acids like glycine. Glycine has crucial functions in the immune response. For an easy bone broth recipe, check out: www.cynthialimd.com/nutrient-dense-cooking-basics/

- **Fermented foods.** Sauerkraut, pickles (naturally fermented, not shelved), kimchi, kombucha.

- **Water and herbal teas.** Filtered tap water is best, or sparkling water with natural minerals, or herbal teas like green or red (rooibos). Keep coffee and black tea in moderation, as caffeine may aggravate anxiety or disrupt sleep. As a general rule, drink enough throughout the day to keep your urine light yellow.

Foods to reduce or remove

- **Alcohol.** Even in moderate doses, it can alter the immune response. In many cases, it can cause a low-grade suppression of the immune system that becomes relevant only after a secondary insult (think a viral infection).

- **Sweeteners.** Studies show that spikes in sugar intake can suppress the immune system. Also, people who eat more sugary foods tend to take in less nutrient-dense foods, potentially depleting the body’s reserves. If you do opt for a splash, reach for raw honey or maple syrup, which possess germ-fighting properties.

- Soda and other sugary drinks

- Processed or refined snack foods

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3 https://www.hindawi.com/journals/omcl/2017/1716701/
4 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4590613/
5 https://academic.oup.com/ajcn/article-abstract/26/11/1180/4732762
Six basic supplements to support healthy immune function*

**Vitamin D3.** This vitamin is essential in fighting off germs\(^6\). Though vitamin D is made in our skin from sun exposure and can be obtained through some natural fats, studies show most people have suboptimal levels. Moreover, inflammation, fat accumulation, older age, and other factors can further decrease vitamin D activity. Deficiencies have been associated with weakened immune responses as well as increased autoimmunity. Most primary care providers can screen your blood levels; the ideal range is 40-60 ng/mL. **Recommended dosage:** 2000-5000IU daily with breakfast (for the average adult).

**Zinc.** Zinc supports the immune system in fending off germs. Animal studies show it helps fight viruses in the coronavirus family.\(^7\) In addition, it helps keep the immune system in check\(^8\), potentially preventing the inflammatory response from going out of control and worsening the illness. **Recommended dosage:** 15-30 mg daily with breakfast.

**Selenium.** Selenium boosts the overall immune response\(^9\) against both viruses and bacteria. Deficiencies in this essential mineral have been associated with weaker immune systems against germs, tumors, and allergens. **Recommended dosage:** 200 mcg daily with breakfast.

**Vitamin C.** This vitamin is a high-potency antioxidant that quenches inflammation\(^10\) and ramps up the production and function of immune cells. It also aids in the production of antibodies when they’re needed to fend off infections. **Recommended dosage:** 1000-2000 mg daily with breakfast. Look for a buffered form for Vitamin C. During an acute infectious illness, increase to 2000-4000 mg daily, as tolerated (higher doses can cause loose stools or some digestive discomfort, so titrate to your symptoms).

**Magnesium.** Magnesium is involved in over 300 biochemical processes in our bodies. Imbalances in magnesium\(^11\) have been implicated in a depressed immune system, insomnia, high blood pressure, muscle dysfunction, and constipation, just to name a few. **Recommended form and dosage:** magnesium glycinate or magnesium citrate 400-600 mg at bedtime. (If you have kidney disease, please check with your doctor before using magnesium at all.)

*For additional supplements, please refer to the section “Other Measures to Consider” later in this e-book.

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6 [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3166406/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3166406/)
7 [https://jvi.asm.org/content/91/8/e01564-16](https://jvi.asm.org/content/91/8/e01564-16)
8 [https://www.sciencedaily.com/releases/2013/02/130207131344.htm](https://www.sciencedaily.com/releases/2013/02/130207131344.htm)
9 [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3723386/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3723386/)
11 [https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/](https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/)
2. Inhabit Your Body.

Move. And Be Mindful.

Movement

Your immune system needs you in order to be fully activated. The lymphatic system—a complex network of channels and nodes woven throughout the body—plays an integral role in immune function, shuttling white blood cells and antibodies where they’re most needed to fight infections. The lymphatic channels, though, are largely passive. What helps pump lymph fluid to flow more efficiently? Your muscles. Moving muscles.

Studies show that each bout of moderate exercise you do (for example, brisk walking for 30 minutes) can strengthen the immune system, but transiently. When you make moderate exercise a habit, though, the benefits of exercise may come to be lasting. Regular moderate exercise is associated with decreased episodes of illness and reduced inflammation throughout the body, which helps immune function. 12

But be careful not to push yourself too hard. Intense exercise, like running a marathon, can have the opposite effect and suppress immune function. 13

Mindfulness

Often, the mind and body are so disconnected that even while you’re moderately exercising in the here and now, your mind can be thousands of miles away or months in the past. Perhaps you’re even purposely distracting yourself with music or a TV show, which seems to be the norm. But is using the body the same as inhabiting the body?

Enter mindfulness. Study after study has shown its benefits to overall health, including the function of the immune system. From increases in antibody levels to increases in numbers of circulating immune cells, mindfulness practices may have real potential to help manage the symptoms of viral infections. 14

Other studies show mindfulness can help people maintain an exercise program, as well as enhance the benefits. Athletes have long used visualizations to improve their performance.

So what might happen if you integrate the mind and body, together?

**Some Ways to Reconnect the Brain and Body**

Choose one or two or all five. Then make them a habit.

1. **Stimulate the vagus nerve.** The vagus nerve is the godfather of the “calming” branch of the nervous system, which greatly impacts immune function, inflammation, and stress. Like any other nerve, the more you activate it, the stronger the response. Here are a few methods for basic rehabilitation:

   - Get throaty. Sing from the back of your mouth. Or gargle with warm water from deep in your throat.
   - Chew your food. When you eat, just eat. No phones or screens. To enhance the benefits, close your eyes as you chew. Chew until the food becomes mash. Try to name as many flavors as you can. Then swallow.
   - Breathe from the belly. Sit, close your eyes, and relax your shoulders. Then place your hands on your navel. Take a deep breath so your belly pushes your hands outward. Hold the in-breath as long as you can. Slowly exhale. Repeat 10 times.
   - Finish your next shower cold. Try 10 or 20 seconds, or perhaps a minute. You’re going for a shiver response, which indicates activation of the vagus.

2. **Start your day with a shot of qi.** Mind-body practices like qigong may support the immune system in as little as a single practice.

   - Do a daily qigong practice. Many free guided practices are available on YouTube.
     10-min practice with Lee Holden: [https://www.youtube.com/watch?v=Ae08KMK-dyI](https://www.youtube.com/watch?v=Ae08KMK-dyI)
     20-min practice with Master Mingtong Gu: [https://www.youtube.com/watch?v=Oj0ewBvr6zM&t=5s](https://www.youtube.com/watch?v=Oj0ewBvr6zM&t=5s)
   - If you’re tired of screen time, try a qigong visualization. Set a timer for 5 minutes. Close your eyes. Relax (try the above belly breaths if you need to relax more). Imagine your immune system. You can picture the circulatory and lymphatic vessels throughout your body, as well as the spleen (a mango-sized organ under the left rib cage) and the bones (marrow, which produces blood cells). Envision these organs filled with golden light. Concentrate on this visualization until the timer goes off. If your mind wanders, gently bring it back to your vision of the immune system as light. And see if you can set the timer for 10 minutes next time.

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16 [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4082307/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4082307/)

3. **Make arm circles.** Standing or sitting, hold the arms out parallel to the floor. Rotate the palms to face the floor. Rotate your arms in small circles, forward 10 times, backward 10 times. Then repeat this 10-10 sequence, making medium circles. Finally, repeat the 10-10 sequence once more, making large circles. This practice can support lymphatic flow. Do this at your own pace. If you’re limited in one or both arms, modify as you’re able. And if the cycle is too intense, reduce it to something that works for you. To deepen the practice, close your eyes.

4. **Walk outside, barefoot.** While sheltering in place, this might mean in your backyard or on your deck. It might mean inside your home. The soles of the feet have more than a hundred thousand sensory nerves that send signals to the brain. Shoes and soled slippers can dampen these signals.

5. **Take a bath.** Immerging yourself in water can awaken the body, relax the mind, and trigger the vagus nerve. The external pressure from water may also support lymphatic flow. Now lie back and relax.

Make Your Next Bath a “Forest Bath.”

Natural killers (NK)—specialized immune cells that stand guard, among other places, in your lungs, lymph nodes, and tonsils—help fend off viral infections. And studies have shown increased numbers of NK cells in people who spent time basking in a forest, as compared with those who stayed firmly in an urban environment. 18

But you don’t have to go too far to experience beneficial effects. Another study showed just 20 minutes in an “urban nature” locale—your backyard counts!—can lower cortisol, a stress hormone that, over time, can weaken the immune system. 19

And studies show that even houseplants, or photographs of nature scenes, have a similar calming effect. 20 So if you don’t have a backyard, or if you’re not able to get outside due to health challenges or to local physical distancing measures, consider moving your houseplants into one room, perhaps the kitchen. Then, whenever you eat, you’re simulating a forest bath.

19 https://www.sciencedaily.com/releases/2019/04/190404074915.htm
20 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4419447/
4. Catch Your Z's.

Sleep Like Your Life Depends on It (Because It Does).

Sleep and the circadian rhythm have strong influences on immune function. Sleep also helps the immune system’s memory. That is, your immune system may “learn” in ways similar to your brain, building up memory in multiple steps, and sleep is a necessary step.

Sleep also enhances relaxation chemicals, lowers stress hormones, and clears the nervous system of toxic chemicals. These synergistic effects can have a huge impact on your capacity against viruses.

What’s more, melatonin, the “sleep chemical,” declines naturally with age. Melatonin has antioxidant properties that can reduce tissue damage during viral infections. Since children have higher melatonin levels, this is one proposed explanation for why they appear to have milder illnesses with COVID-19.

So, how much sleep do you need? The Center for Disease Control recommends a minimum of seven hours a night for adults. The need varies from person to person, but a good general rule of thumb is that you wake up refreshed. If you have chronic sleep challenges or fail to wake up refreshed, seek guidance from a health care professional.

Here are some suggestions to improve your sleep quality:

- Set a regular schedule. Aim to rise and sleep at roughly the same time each day and night.
- Get 20 minutes of bright light exposure after rising. Natural sunlight is optimal.
- What you do during the day matters just as much to your sleep quality as what you do before bedtime. So consider simple, 5- to 10-minute stress-relieving meditations throughout the day. The internet is full of free videos and guided audios.
- Take a brisk walk or swim or do another form of aerobic exercise for at least 30 minutes a day. Best to do this before evening, so it doesn’t energize you too late in the day.
- As the sun sets, begin to slow down your day. Consider dimming indoor lights.
- Check medications for sleep-disrupting side effects. If there are any, talk to your doctor about alternatives.

21 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3256323/
23 https://www.cdc.gov/sleep/about_sleep/how_much_sleep.html
• Avoid caffeine or sugary foods, especially in the evening.

• Limit alcohol intake. If you must, drink less, earlier, and with food.

• Reduce exposure to blue light (which inhibits melatonin production, thereby interfering more with sleep rhythms than other wavelengths of light) by turning off your electronic devices before bed, or activating blue light filters.

• Create a sleep sanctuary: keep the bedroom cool (65° F or less), move digital clocks out of sight, remove electronic devices from the bedroom, and consider blackout curtains or eyeshades.

• Practice letting go of “wakefulness.”

For additional support, see the discussion of magnesium in the section “Nourish Yourself” and the discussion of melatonin in the section “Other Measures to Consider.”
5. Practice Pleasure.

Reach In. More Importantly, Reach Out.

Laughter and humor are associated with increases in immune cells and infection-fighting antibodies, enhancing our resistance to infection. They can also reduce anxiety and increase relaxation. One study found that moderate laughter (aka, Laughercise) had physiological benefits equivalent to moderate exercise. And doctors across specialties—geriatrics, oncology, psychiatry, physical rehabilitation, rheumatology, and general medicine—have been prescribing laughter as therapy.

Necessary physical distancing does not mean social isolation. Loneliness, in fact, alters the immune system and increases susceptibility to illness. Studies show it’s more dangerous than smoking in its risks for depression, cardiovascular disease, dementia, and yes, immune suppression.

So during times of acute stress, play and connection aren’t “extra.” They’re paramount.

Here are some suggestions:

- Listen to music from a time in your past that was “a golden time.” If you can’t think of such a time, listen to music that feels life-affirming and upbeat to you. Find music with a good beat, and dance to it, alone or with your cooped-up family, or have a virtual dance party with friends.

- Learn or revisit a musical instrument. Perhaps you have a toy ukulele your child never took to, or a piano that has sat untouched. Learn a few songs via YouTube. Or locate a teacher offering virtual lessons (local is best, so when the physical distancing measures are obsolete, you can continue in-person lessons).

- Go to YouTube and search “funny videos.” Watch a few and laugh along—whether this laughter is fake or real: your body doesn’t discern. If you have a smile on your face and laugh from your belly, your body releases endorphins and other calming chemicals into your bloodstream. There are plenty of funny videos, too, on the COVID-19 pandemic!

24 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2686627/
26 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762283/
27 https://www.medicalnewstoday.com/articles/303084
28 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3890922/
• Practice “laughter yoga” via live chats with friends. Better yet, call someone you haven’t connected with in years.
  – Clap your hands in a steady rhythm.
  – Chant “ho, ho, ho… ha, ha, ha…” in time with the clapping.
  – Now start walking around the room as you clap and chant.
  – Thank yourself and your friends when it’s over.
Other Measures to Consider

**Gargling.** While the science on gargling is far from robust, this measure is simple, low cost, and low risk. Some preliminary studies suggest it may reduce or prevent upper respiratory infections:

- Gargling with salt water once a day decreased the rate of illnesses and fever in young children. 29
- Gargling with green tea extracts decreased the flu rate in a nursing home from 10 to 1.3%. 30

**Melatonin.** Melatonin has been shown to reduce lung injury during viral infections. 31 It has antioxidant properties and can help you sleep better. **Recommended dosage:** start with 1 mg at bedtime, and titrate up as needed to 2-5 mg. If you seem to need higher doses, see a health care professional to rule out other causes of insomnia. Taking too much melatonin for longer periods of time can suppress your body’s own production.

**Quercetin.** A compound found in fruits, vegetables, and green tea, quercetin has shown anti-viral activity against the flu and common colds, reducing inflammation and hyperactivity in the lungs. 32 **Recommended dosage:** 800-1200 mg 1-2 times a day.

**Allicin.** This garlic extract has been shown to boost immune strength and support heart health. 33 **Recommended dosage:** 500-1,000 mg taken with food (to minimize stomach irritation). Note: fresh garlic is better absorbed than in supplement form. 34 Do **not** use allicin or garlic supplements if you’re on blood-thinning medications like Coumadin or aspirin.

**Ashwagandha.** This ancient herb extract can strengthen different lines of immune cells, and also ease stress and anxiety. 35 **Recommended dosage:** 200-300 mg 1-2 times a day. Try this at night if stress is affecting your sleep quality.

29 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3798579/
30 https://www.jstage.jst.go.jp/article/jscpt/43/1/43_1_9/_pdf
32 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4728566/
https://www.longdom.org/open-access/quercetin-a-promising-treatment-for-the-common-cold-2329-8731.1000111.pdf
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3763034/
33 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4417560/
34 https://www.mdpi.com/2072-6643/10/7/812
35 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3573577/
If in doubt, leave these out

**Immune-stimulating supplements.** The research on immune-stimulating supplements, like certain mushroom or herbal formulations, is mixed. For example, some experts warn that elderberry extract activates inflammatory pathways that could worsen COVID-19 illness. Others say elderberry is fine, that the evidence isn’t there. When in doubt, consult your doctor or try alternatives listed above.

**NSAIDs** (non-steroidal anti-inflammatory drugs). This popular class of drugs (ibuprofen, Advil, Motrin, naproxen, Aleve, aspirin) set off some alarms early in the pandemic as potentially worsening the outcomes of COVID-19 illness. Whether this is the actually the case, at least at the time of this publication, still remains unclear.

These drugs are often used to reduce fever. But it turns out that fever may be protective in fighting infections. Rises in body temperature greater than 38-39°C Celsius boost the immune system and discourage viral replication. As a general trend, children mount fevers more often than adults.

For fever, first try cool towel compresses and aggressive intake of water and fluids (coconut water, salty broths). Indications for NSAIDs: dehydration, lethargy, or persistent fever higher than 40°C Celsius.

For aches and pains, first try magnesium (see the section “Nourish Yourself”).

If you’re taking NSAIDs on a regular basis for chronic conditions like heart disease, arthritis, or autoimmune conditions, do not discontinue usage. The benefits in these cases likely outweigh the risks.

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38 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4145646/#B16
Looking Back

Lessons from the Spanish Flu Pandemic of 1918.

At the time of this publication, physical distancing measures have only been active for a couple of weeks in most states in America. Yet the restlessness is already palpable. The mental, emotional, and physical fatigue of doctors, nurses, and other frontline workers is already taking its toll. The economy risks greater strain. All of this amounts to an enormous disruption in and threat to life as usual.

If we can learn anything from the Spanish Flu pandemic of 1918, which killed some 100 million people worldwide and 675,000 Americans, it’s that we can’t let our efforts get lax too early. The cities that eased physical distancing measures too early consistently saw increases in new cases and rises in death rates. Those who followed them longer and more strictly fared better. And this was without any of the public health measures we have today. 39

Now more than ever, patience is a virtue.

Looking Forward

We Can Flatten, Then Halt the Curve.

Compared to 1918, we now have more information and technology. We have tests on the imminent horizon to screen for immunity and to track the progress of cases better. We have studies underway to test the effectiveness of different drugs against COVID-19. We have the capacity to build out more support in the way of ventilators and to find spaces like hotels or ships for temporary hospital beds. We have means of disseminating information like never before.

We also have technological means to cultivate social connection despite physical distancing. Staying connected to others is of utmost importance to both your personal inner shield and your community’s collective shield. Through phone calls, emails, and videoconferencing, schools are continuing, agencies are running, church communities are worshipping, and neighbors are helping each other. We can reach out, learn, and grow together. In the words of renowned biologist E. O. Wilson, this is “one planet, one experiment.” We all play a role in the outcome of this situation.

When this pandemic ends, we can let down the outer shield. But maintaining the inner shield—caring for ourselves—will enable us to care better for others, too. The *whats* of self-care, like food, vitamins and minerals, and hygiene measures, can provide some immediate results. But the *hows* establish a deeper, longer term benefit. How we’re connecting to our food. How we’re moving throughout our days. How we’re tuning into our bodies. This subtle but powerful shift can train the mind to respond rather than react, rest as well as resist, and restore rather than retreat, which better prepares us for whatever the future holds.

*This is a brave new medicine.*