

Additions

4/29/2020

<https://www.pennlive.com/coronavirus/2020/04/dauphin-and-york-county-coroners-on-covid-19-this-is-not-like-anything-we-have-ever-had.html>

4/22/2020- *hydroxychloroquine trials have had increased mortality rates and were stopped in some US locations. There are many phytonutrients that might inhibit the SARS CoV2 virus more than HCQ might based on computer modeling of the protein shapes. They also have the advantage of being generally nontoxic and may be available in foods or as supplements/bulk powder which could be added to residential foods and supplement the diet content on average (bioflavonoid fiber/powder for example). See this post

<https://transcendingsquare.com/2020/04/17/phytonutrients-that-may-help-against-sars-cov-2/>

Flavonoids as neuroprotectants

<https://www.frontiersin.org/articles/10.3389/fnagi.2019.00155/full>

Flavonoids as alternative care for Epilepsy

<https://academic.oup.com/advances/article/10/5/778/5492591>

Vestibular function (vertigo, dizziness, ringing in the ears can all indicate damage to fragile hair cells, magnesium and hydration levels can be risk factors during infection/illness, or loud noise or medications *Aminoglycosides and aminocyclitols*

<https://www.sciencedirect.com/topics/neuroscience/vestibular-function> -- CNS symptoms after recovery may be inflammation related rather than directly due to viral infection within the brain. The occurrence of neurological symptoms with COVID19 illness is being studied.

Preventive nutrition can help protect the brain from some of the risks of oxidative stress chemicals, iron, and other toxins that can increase when there are cells dying faster than white blood cells can remove the debris safely - like a strike by sanitation workers, or sadly, like too many bodies for the mortuary to cope with at once. Increasing use of antioxidants helps give the body more defense, not more white blood cells but more buffering capacity to detoxify the oxidative stress chemicals and iron.

(Iron is shifted out of hemoglobin and into cell storage during inflammation in a strategy that would be defensive against a bacteria that depends on iron to be able to grow and replicate. Cancer cells also need iron.)

Additional addition - Addition: It is being recommended to the FDA to fast track approval for preventive, early treatment with zinc and an anti-malarial and an antibiotic that are fairly available and have a long history of use, so risks and dosing have been studied. *"It's important to note that HCQ, zinc, and azithromycin are very well understood drugs with clear safety profiles; they are widely available, generic, inexpensive, and can be scaled rapidly, including to the developing world, which would be expedited by US leadership in recommendations."* More is included in the second half of this post about

the zinc and anti-malarial medication. See this document for the recommendation to the FDA: ([Immediate Treatment for Early Stage SARS-CoV-2 Infections](#)).
(goal rewrite all of this into a cohesive doc)

Addition - Food sources of vitamin C, quercetin, and zinc are at the top of this document, which includes this blog post and a few others on the topic of COVID-19 [([Antivirals in Foods](#))*Which is this document.] Eating good sources several times a day may help the body prevent infection or have a less severe case.

Virus enter a cell and are replicated to the cell's capacity to produce them, at that point the cell bursts releasing the newly formed virus which go and infect other cells and force those cells to make even more virus to the cell's capacity, and they all burst, releasing yet more virus - in an exponentially increasing number. Each time a cell bursts and releases the viral load, the cell dies. So the sooner you can help your body stop the viral replication the sooner you are protecting your cells from being killed by the process.

Megadoses of the nutrients that help stop viral replication may not be needed. Moderate amounts of good food sources may help the body fight the infection before it has spread to numerous cells and caused significant cell damage. Reducing infection load may also help prevent an over-reaction of the immune system to the infection. An over-reaction of the immune system can be deadly as the inflammatory chemicals can attack healthy cells and lead to organ failure and eventually death. The next section is about a nontoxic treatment that might help if an over-reaction of the immune system leads to a Cytokine Storm/sepsis reaction.

Foods contain antivirals that work in a similar manner to the chloroquine medications that we have been hearing about in the news. More production is needed before they are available for widespread use, and they are somewhat expensive and can be dangerous. Quercetin is a phytonutrient that is readily available in vegetables and fruits and as a bulk or individual supplement.

Nursing homes and hospitals could be adding the bulk supplement powder to a food at each meal and including zinc food sources. The zinc is carried into infected cells by the quercetin (or chloroquine) and the zinc disrupts viral replication. The chloroquine, quercetin, or zinc are not killing virus. White blood cells are the body's patrol for killing and removing infected cells.

Zinc is also necessary for the body to be able to make antibodies, and older adults may lose the ability to make antibodies unless they have additional zinc in their diet.

- Haase H, Rink L. The immune system and the impact of zinc during aging. Immun Ageing. 2009;6:9. Published 2009 Jun 12. doi:10.1186/1742-4933-6-9 (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2702361/>)

Health takes work and work takes nutrients.

- Vitamin C helps the immune system fight infection. Good sources include: cabbage, tomatoes, green peppers, broccoli, asparagus, peas, kale, & citrus, strawberries, kiwi, papayas, cantaloupe. ([Vit C Fact Sheet](#))
- Good food sources of quercetin include: red onion, onion, garlic, kale, tomatoes, asparagus, broccoli, capers, nuts and seeds, red grapes, cherries, olive oil. Herbal supplements also containing quercetin include St John's Wort, Gingko biloba, and American Elder. ([WebMd](#))
- Good food sources of zinc include oysters, meats, poultry, dairy, cashews, pumpkin seeds. Other beans, nuts and seeds would also have some as vegan sources. Meats have more than the vegan sources, while oysters have so much zinc that it might risk excess if eaten regularly in large servings. ([Zinc Fact Sheet](#)).

There are no guarantees in life, but trying a nontoxic strategy is at least safe. Medications may have risks of side effects - always see a medical professional for individualized health care guidance.

Additional addition: regarding the idea that individuals wouldn't need to know too much about the medications that might be helpful because they would need to be prescribed by a medical professional - I, as a Registered Dietitian, am not in the category of individual patient when I am seeking more information about health strategies or treatments. As a dietitian I was trained and expected to understand the basic mechanism of action of drugs and any nutrients interactions that might make a patient need more of a nutrient in their diet or to avoid a nutrient or food. As a medical professional it is in my job training and experience to actively seek and read medical research regarding any diagnosis that is rare enough to not have standardized guidance available for patients or practitioners.

- The antiviral properties of vitamin C
<https://www.tandfonline.com/doi/full/10.1080/14787210.2020.170648>
- Quercetin also has antiviral activity, slowing replication and reducing excess production of cytokines, "*In mice infected with RV, quercetin treatment decreased viral replication as well as expression of chemokines and cytokines. Quercetin treatment also attenuated RV-induced airway cholinergic hyperresponsiveness.*"
Ganesan S, Faris AN, Comstock AT, et al. Quercetin inhibits rhinovirus replication in vitro and in vivo. *Antiviral Res.* 2012;94(3):258–271. doi:10.1016/j.antiviral.2012.03.005
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3360794/>
- Quercetin derivative also found to help prevent Ebola virus infection: Qiu X, Kroeker A, He S, et al. Prophylactic Efficacy of Quercetin 3-β-O-d-Glucoside against Ebola Virus Infection. *Antimicrob Agents Chemother.* 2016;60(9):5182–5188. Published 2016 Aug 22. doi:10.1128/AAC.00307-16 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4997876/>
- Treatment for severe acute respiratory distress syndrome from COVID-19.
[https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30127-2/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30127-2/fulltext)

Marik Protocol based on COVID19 treatment in China/elsewhere - is not typical of ARDS, needs more oxygen than pressure from the ventilator support or damage may result

https://www.evms.edu/media/evms_public/departments/internal_medicine/EVMS_Critical_Care_COVID-19_Protocol.pdf

- Critical Care Alert: Reviewing the Evidence for CITRIS-ALI Study
<https://www.emra.org/emresident/article/critcare-alert-citris/>
- Sepsis-related hypertensive response: friend or foe?
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4039975/>
- A pilot study of hydroxychloroquine in treatment of patients with common coronavirus disease-19 (COVID-19)
- <http://www.zjujournals.com/med/EN/10.3785/j.issn.1008-9292.2020.03.03> *This trial of hydroxychloroquine in China does not mention providing zinc with it in which case the study is not a valid trial of the medication as the zinc is what disrupts viral replication and the hydroxychloroquine only carries the zinc into infected cells - it does not kill virus or infected cells itself.
- The 'official' mechanism of action of the chloroquines as anti-malarials or anti-virals is not 'officially' known - however it has been known from early in its use that it doesn't work as an anti-malarial without providing the patient with zinc along with the chloroquine medication. It is known that chloroquines can have significant side effect risks. - *Chloroquine, Past and Present*.
<https://blogs.sciencemag.org/pipeline/archives/2020/03/20/chloroquine-past-and-present>
- Quercetin is a bioflavonoid with no known risks of toxicity and it is in human clinical trial stages as an anti-viral when provided with zinc as the mechanism of action is as a zinc ionophore. The quercetin carries zinc into an infected cell where the zinc disrupts protein assembly and the virus can not be replicated and released to infect other cells.
Montreal researchers propose a treatment for COVID-19
<https://www.mcgilltribune.com/sci-tech/montreal-researchers-propose-a-treatment-for-covid-19-170320/>
- *China kidnapped two Canadians. What will it take to free them?* - includes a little more info about the quercetin/zinc human trial planned to take place in China with COVID-19 patients - the query is about the possibility of the public health mission being used as a negotiating tool for release of the two Canadians being held by the Chinese government.
<https://www.macleans.ca/politics/china-kidnapped-two-canadians-what-will-it-take-to-free-them/>
- Artemisinin, the Magic Drug Discovered from Traditional Chinese Medicine
<https://www.sciencedirect.com/science/article/pii/S2095809918305423>
 - *The virus inhibits Heme metabolism in red blood cells by binding to porphyrin
https://chemrxiv.org/articles/COVID-19_Disease_ORF8_and_Surface_Glycoprotein_Inhibit_Heme_Metabolism_by_Binding_to_Porphyrin/11938173
- (note to self, buy this: Tannins: Bioavailability and Mechanisms of Action
<https://onlinelibrary.wiley.com/doi/pdf/10.1002/9783527626588.ch29>)

Eat Food - Antivirals are found in common foods.

J. Depew, R.D, Feb, 24, 2019

Chloroquine medications are dangerous, many medications are dangerous especially if taken in too large a dose. Chloroquines are typically used to treat malaria, a condition caused by a parasite. The mechanism of action is that the chemical can hold onto the mineral zinc and carry it into an infected cell where the zinc disrupts the replication of proteins, causing less virus replication. ([6](#)) It has been mentioned as a medication that potentially may be helpful for treating patients with the novel coronavirus that is currently causing a pandemic.

The chloroquine medications are also used by autoimmune patients and supplies of the drug are limited. Increasing production is a goal but will likely take some time. ([7](#)) There are other safer alternatives available in foods or phytonutrient extracts ([1](#), [8](#), [9](#)) that have an immune modulating effect - promoting removal of infected or damaged cells while also inhibiting an overactive immune response.

People with a heart condition may also be at more risk of dangerous side effects if taking chloroquines. The medication also needs to be given with zinc to be as effective as possible. The food or phytonutrient alternatives would also need to be used with zinc in the diet or added as a supplement. ([1](#), [8](#), [9](#))

***** ONLY TAKE PRESCRIPTION MEDICATIONS THAT ARE PRESCRIBED FOR YOU BY YOUR OWN MEDICAL PROFESSIONAL *****

***** ONLY EAT FOOD *****

Someone is dead because they consumed a household product containing chloroquine because they thought it might protect them from coronavirus infection, ([10](#)), - dead is not infectable by a virus, but dead is also dead.

Quercetin plus zinc is also an antiviral that works as a zinc ionophore, ([1](#)), however it is readily available in some common foods or as a supplement and is nontoxic to cells. ([1](#), [2](#)) The zinc is disrupting protein replication within the infected cell so the virus can not be replicated to spread to other cells, for more replication, more infecting other cells, more replication, etcetera.

Onions are the richest source of quercetin (4) and citrus peel is also a very rich source. (3) Pumpkin seeds are the richest source of zinc in a vegetarian diet and is commonly available in meats in a non-vegetarian diet.

Pomegranate peel extract or the inner white membrane of a pomegranate is also a source of quercetin and another phytonutrient that acts as a zinc ionophore (epigallocatechin-gallate). (1) It also would be nontoxic to healthy cells and low risk compared to the chloroquine medications. (2) However it can have some side effects, acting as a diuretic and has COX2 inhibition activity. (recent post, older post) A tablespoon or two of the liquid extract or inner white membrane can be enough to provide some health benefits for an adult. (G13: Preparation & Benefits of Pomegranate)

Onions, citrus peel, pomegranate peel - we have choices, safe choices, to help our body's own defense system stop the coronavirus. Chloroquines do not kill coronavirus - it helps our own defense system do its job - but with more risk to healthy cells, and normal function than onions, citrus peel or pomegranate peel or quercetin supplements. Zinc is a trace mineral which we need in small amounts, a larger dose taken for a week or two would be unlikely to build up to toxic amounts but please be aware that in large doses a zinc supplement could become toxic.

Eat food - that is what our body is designed for. If the GI tract is inflamed and the idea of eating food is no longer appealing due to pain or constant diarrhea than please see the recent post: [ACE2, Diarrhea, & COVID19 – it gets complicated](#). and try to eat small servings of something that might help heal and stop the inflammatory reaction in the intestinal tract.

If nausea and vomiting are also symptoms, hold off on the food and just sip water that has a dash of lemon or lime juice or apple cider vinegar. Those all have a type of acid that is similar to stomach acid. In cases of severe nausea even plain water can be unsettling and larger amounts of anything can be a problem. Start gradually with small sips of the lemon water, or a lime or lemon popsicle may be soothing and not cause more vomiting.

Once feeling better some of the mucilaginous or hydrolyzable tannin foods mentioned in the recent post ([ACE2, Diarrhea...](#)) can help replace the mucous lining that coats the intestinal tract during times of health. It also serves as a defense system, helping to prevent entry of virus or other pathogens into the body between intestinal cells. And white blood cells patrol the area and actively defend against pathogens.

Pomegranate peel also provides hydrolyzable tannins if the white membrane is used in prepared foods like a bean soup ([G8: Cookies & Bean Soup/recipes](#)) or sweet potato dish. Pomegranate peel and citrus peel and onions (less so) are also sources of vitamin C which also helps our body's natural anti-viral defenses. (5)

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Reference List

Table of drugs and phytonutrients that are being investigated for use as a COVID19 treatment, (@rubbersoul23, Eric/table) based on *A SARS-CoV-2-Human Protein-Protein Interaction Map Reveals Drug Targets and Potential Drug-Repurposing*, March 23, 2020, ([biorxiv.org](https://www.biorxiv.org))

PDF about chloroquine and hydroxychloroquine dosing and safety

<https://drive.google.com/file/d/19T-QIaE6FT-PzfWcnbTr5g6ZnV34WcL2/view?usp=drivesdk>

*Adverse cardiac risks can be more likely for people with a history of cardiac issues, and when hypomagnesemia or hypokalemia are present. Low magnesium levels can be a cause of low potassium levels in addition to low dietary intake of potassium or other metabolic issues related to hormones and kidney health. Epsom salt foot soaks or a bath with the magnesium sulfate salt can bypass poor absorption of magnesium in the intestines. Ref re hypomagnesemia as a cause of hypokalemia (low potassium blood levels)

<https://www.medicalnewstoday.com/articles/321735>

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End of Reference list - Eat Food

Updates/ Vitamin C Infusion is helping CoV-19 patients in New York.

March 25, 2019

Good news updates - a hospital chain in New York has found the use of high dose intravenous Vitamin C Infusions helpful for patients infected with the SARS-CoV-2 (COVID-19) novel coronavirus. "Dr. Andrew G. Weber, a pulmonologist and critical-care specialist affiliated with two Northwell Health" is providing his patients who have sepsis/cytokine storm symptoms an intravenous drip with 1500 mg of vitamin C three or four times per day. (1) Patients getting the Vitamin C treatment have been helped more than patients who did not according to Dr. Weber. A spokesperson for the Northwell Health system said that vitamin C is being "widely used" at their hospitals where 700 patients approximately are being treated for SARS-CoV2, however it varied by patient need and the clinician's plan of care. (1, 2)

"The patients who received vitamin C did significantly better than those who did not get vitamin C," Weber said. (1)

The protocol for the treatment also includes vitamin B1 generally but that news article doesn't mention that ingredient of the IV mixture. The treatment is a much larger amount of vitamin C than the daily recommendation for a normal diet, however a patient with an overactive immune response is not in normal health. The treatment is used for patients who have had an overactive immune response to the infection and their own immune cytokines become produced in excessive amounts. The cytokines can then start damaging the patient's own organs which can lead to organ failure and result in death.

The damaging immune chemicals in a normal response to infection would only attack the infected cells. The excessive amounts however use up all supplies of vitamin C in the patient's body, and supplying vitamin C in high doses is then very helpful for protecting the patient from harm by the excess.

Quercetin plus zinc is a zinc ionophore, and is being tested as an anti-viral in human clinical trials for the treatment of SARS-CoV2 (COVID-19).

Good news update regarding quercetin and zinc as a zinc ionophore - the combination had already made it through animal trials for use against Ebola, and SARS-CoV(1) and was approved by the FDA for human clinical trials. Plans were underway for it to be trialed in China for patients with SARS-CoV2 (COVID-19). I haven't found results yet.

- CBC News Interview with "*Dr. Michel Chrétien's team at the Clinical Research Institute of Montreal*" : *Canadian team invited to do clinical trials in China for antiviral drug.* Feb 28, 2020, ([youtube](#)).

UK What to do if at home with a Potential Infection, Guidance:

Stay at home: guidance for households with possible coronavirus (COVID-19) infection.
Updated 24 March 2020, ([gov.uk](#)).

*The UK guidance recommends isolating for seven days after symptom onset, - it might be wise to use caution longer than, especially if trying to protect people in your home who are in a high risk group, which includes: Senior Citizens, people with asthma or other lung conditions, smokers, people with hypertension, and immune-compromised people.

While the infectious stage seems to start prior to symptom onset and to have the most risk of spreading the infection during the early days of symptoms, when a fever is also often a symptom, that might not be consistently true and not everyone infected with SARS-CoV-2 gets a fever. The longest a patient has been found to be infectious was 37 days and the shortest was eight days. The average for patients with severe symptoms being treated in a hospital to be

infectious was 19 days and for patients with critical symptoms the average was 24 days to remain infectious. (4)

Sensible precautions if sharing a home with infected and non-infected people include:

- Cover your coughs or wear a mask or bandana to catch respiratory droplets from your breath, coughs or sneezes. Try to avoid being in the same room with non-infected people if possible, at least during the highest risk days during the early onset of symptoms, or positive test result.
- Wash hands often and sanitize or wash with soap any commonly used surfaces such as door knobs, kitchen and bathroom areas.
- Don't prepare raw foods for non-infected people if you can avoid it. Otherwise wash hands thoroughly or wear food preparation gloves if possible after the initial week or two of more severe feverish symptoms has passed.

This is doable - the quercetin rich foods mentioned in the last post plus zinc supplements or foods may provide a protective effect against getting a viral infection. Stay calm and eat sauteed onions or citrus with a little of the peel left on, plus pumpkin seeds or meats. Best wishes for everyone's health!

Request for plasma donations from people recently recovered from SARS-CoV2, Mount Sinai

There is a request for people who have recently recovered from SARS-CoV2 (COVID-19) and who would be willing to donate plasma if they have antibodies against the infection to contact Mount Sinai's medical team. Antibody rich plasma can be given to severely ill patients with the infection to help them fight the virus. They can check for the presence of antibodies. Contact: COVIDSerumTesting@mountsinai.org, see (Statement from Mount Sinai Chief Medical Officer, (via [@MikeDelMoro](#)/via [@joshchafetz](#)).

Mount Sinai medical system has developed a test for checking for CoV-19 antibodies within hospitals and are sharing the technique: *BREAKING: The First U.S. Test to Detect If a Person Has Potential Immunity to COVID-19 Was Just Developed* ([leapsmag.com](#))

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Reference List

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End of Reference list - Vit C being used in NY

ACE2, Diarrhea, & COVID19 - it gets complicated.

March 20, 2019

The reason lung edema and diarrhea and other digestive symptoms ([30](#)) are potential symptoms of the novel coronavirus, (SARS-CoV2, also called COVID-19), and not infrequent as a way for the symptoms to start, ([13](#)); is because the virus is infecting cells by entering at ACE2 receptors. ACE2 receptors seem to have a role in cardiovascular health and they are more prevalent within the lungs and in the duodenum of the GI tract. ACE2 receptors also tend to be present in more quantity in men, in smokers, and in people taking one of two different groups of medications.

"It has also been confirmed...SARS-CoV-2 uses the same receptor, the angiotensin converting enzyme II (ACE2), as the SARS-CoV [11]" "a 3D structural analysis indicated that the spike of SARS-CoV-2 has a higher binding affinity to ACE2 than SARS-CoV [23]" (academic.oup.com/nsr/advance-article/doi/10.1093/nsr/nwaa036/5775463)

The ACE Inhibitors ([list](#)) block an enzyme involved in the chemical pathway and Angiotensin Receptor Blockers (ARBs, [list](#)) inhibit the ACE2 receptor in addition to inhibiting Angiotensin Receptors. Angiotensin is involved in the chemical pathway which gets complicated - watch the video: *Coronavirus Pandemic Update 37: The ACE-2 Receptor - The Doorway to COVID-19*

(ACE Inhibitors & ARBs). (1) (And for more information: an overview article on the ACE2/Angiotensin chemical pathway. (6))

Part of the complicated part is also the question of what to do about those medications while there is risk of infection - the consensus is, more information is needed. While having been on one of them may increase the risk of infection due to there being more ACE2 receptors than usual, stopping abruptly wouldn't immediately get rid of the extra ACE2 receptors and the medications, particularly the ARBs which block the ACE2 receptors may have a protective effect once exposure to the virus occurs. (1)

As the viral infection advances in severity - more and more virus have been replicated and many cells are infected - the patient's symptoms tend to become similar to genetic knockout mice bred to have zero ACE2 receptors. The mice don't do well over time, developing cardiac problems and other symptoms similar to COVID19 patients with more severe cases. (1) If the viral load was very large than the patient's ACE2 receptors might all have been filled with virus - making the patient phenotypically similar to a mouse with zero functional ACE2 receptors.

ACE2 enzyme is also present in the body in a free floating form, not just as a receptor embedded within cell membranes. A potential treatment possibility early in exposure would be to give the patient large amounts of the soluble ACE2, (7), - the free floating enzyme would attract virus to lodge into the enzyme but it would have no cell to enter and it is our cells, or another infected species cells in which virus are replicated. The viral design takes over our own gene replicating processes within the cell and set our own body to work making many many copies of the virus. When a cell is maxed out on replication of the virus the cell bursts and the many, many virus are free to circulate looking for more cells with ACE2 receptors to enter and set to more replication.

Symptoms include chest pain, difficulty breathing, a feeling that a breath isn't really getting oxygen (because it isn't, lung function is significantly reduced, requiring a ventilator or other breathing support). With more severe illness, all those infected cells that burst to release virus are dead and the area would have inflammatory damage from the cellular debris. Some patients who recover have been found to have continuing decreased lung function by ~ 20-30%, enough to leave them winded, short of breath, after minimal exercise such as walking. Reinfection also seems to be possible as the antibodies against the virus don't seem to last very long. (4) Which suggests that pinning our hopes on a vaccine or herd immunity would be foolish.

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Diet tips that might help inflammatory GI symptoms.

Now, change of topic, what to do about diarrhea and other digestive symptoms? The digestive symptoms may include stomach pain/nausea, vomiting, and intestinal pain after eating, particularly after some types of foods. Inflammatory digestive conditions can be helped by eating foods that are similar to the layer of mucus that lines the intestines during normal health.

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content of the bowel movement as well as by reinforcing the mucus like lining of the intestinal tract.

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Tannins are typically found in tea (tea leaves) and other tree leaves such as Sassafras leaves made into Gumbo File or Bay Leaves that are added to a soup broth at the beginning of cooking and removed before serving the food. Condensed tannins don't bind with water and are even more prevalent in leaves, making up as much as fifty percent of the tannin content within leaves of most plants. (12)

Oak leaves are also a source of tannins, and are traditionally used to "*tan*" hides - with the tannin rich oak leaves. The initial soaking process with the tannin rich leaves prepares a deer skin so the hair can be scraped off the leather hide more easily - it still is a lot of work to tan a

hide in the traditional way. Oak barrels are used in the aging of wine and liquors possibly because of the gradual addition of tannins to the aging alcohol product.

Walnuts also have hydrolyzable tannins and the binding of water and other nutrients is visibly noticeable when walnuts are cooked with sweet potatoes in a casserole - the dish can turn brown in color instead of the pretty orange color of sweet potatoes. It has not turned bad, it has hydrolyzed the tannins. The hydrolyzed tannins bind with other nutrients too and can slightly reduce nutrient availability for absorption out of the intestines , ([15](#)) , - however if the goal is to heal inflamed and painful intestines than having more nutrients stay in the intestines may be part of the benefit - literally reforming the mucus lining of the GI tract that would be continually lost when severe watery diarrhea is an all day problem.

A larger quantity of tannins can also be obtained from pomegranate peel. The white inner part of the peel has slightly less than outer peel which makes it less bitter in flavor and less of a diuretic. Tannins have a diuretic effect and a larger serving of pomegranate peel products can have too much of a diuretic effect. I use a vegetable peeler to remove the outer reddish-purplish rind and then I separate the white membrane from the seeds and trim away any bad spots from the white membrane and remove any discolored or spoiled seeds.

The white membrane of the pomegranate peel can be minced and added raw to a salad or added to a soup. In foods that are acidic the color of the membrane and the dish you are preparing will become more reddish in color or might turn brownish if the tannins are hydrolyzing with other ingredients and the water content. In foods that are alkaline the color will turn brown. This is least noticeable in black bean soup, white beans will have a brown broth and greenish split pea soup looks odd (warning - foods are chemistry and this is kind of fun).

The red part of the peel can be used in tea or to make a liquid concentrate that is used in small amounts but it is too bitter to eat and the diuretic properties can be potent - have the extract or tea early in the day and drink plenty of water throughout the day to help it pass through before you hope to sleep through a night. Why would you bother then? Pomegranate peel has a long list of medicinal benefits potentially including cancer treatment or prevention. It is antimicrobial, anti-worm, etc, a long list, see this webpage for health benefits, preparation and menu ideas: [G13: Pomegranate](#). A bean soup recipe using dry beans is the last recipe on page, [G8: Cookies and Bean Soup](#).

Disclaimer: Opinions are my own and the information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes.

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The reason lung edema and diarrhea and other digestive symptoms (30) are potential symptoms of the novel coronavirus, (SARS-CoV2, also called COVID-19), and not infrequent as a way for the symptoms to start, (13); is because the virus is infecting cells by entering at ACE2 receptors. ACE2 receptors seem to have a role in cardiovascular health and they are more prevalent within the lungs and in the duodenum of the GI tract. ACE2 receptors also tend to be present in more quantity in men, in smokers, and in people taking one of two different groups of medications.

The ACE Inhibitors (list) block an enzyme involved in the chemical pathway and Angiotensin Receptor Blockers (ARBs, list) inhibit the ACE2 receptor in addition to inhibiting Angiotensin Receptors. Angiotensin is involved in the chemical pathway which gets complicated - watch the video: *Coronavirus Pandemic Update 37: The ACE-2 Receptor - The Doorway to COVID-19 (ACE Inhibitors & ARBs)*. (1) (And for more information: an overview article on the ACE2/Angiotensin chemical pathway. (6))

Part of the complicated part is also the question of what to do about those medications while there is risk of infection - the consensus is, more information is needed. While having been on one of them may increase the risk of infection due to there being more ACE2 receptors than usual, stopping abruptly wouldn't immediately get rid of the extra ACE2 receptors and the medications, particularly the ARBs which block the ACE2 receptors may have a protective effect once exposure to the virus occurs. (1)

As the viral infection advances in severity - more and more virus have been replicated and many cells are infected - the patient's symptoms tend to become similar to genetic knockout mice bred to have zero ACE2 receptors. The mice don't do well over time, developing cardiac problems and other symptoms similar to COVID19 patients with more severe cases. (1) If the viral load was very large than the patient's ACE2 receptors might all have been filled with virus - making the patient phenotypically similar to a mouse with zero functional ACE2 receptors.

ACE2 enzyme is also present in the body in a free floating form, not just as a receptor embedded within cell membranes. A potential treatment possibility early in exposure would be to give the patient large amounts of the soluble ACE2, (7), - the free floating enzyme would attract virus to lodge into the enzyme but it would have no cell to enter and it is our cells, or another infected species cells in which virus are replicated. The viral design takes over our own gene replicating processes within the cell and set our own body to work making many many copies of the virus. When a cell is maxed out on replication of the virus the cell bursts and the many, many virus are free to circulate looking for more cells with ACE2 receptors to enter and set to more replication.

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Hydrolyzable tannins may help protect against cancer cells and other damaged or infected cells by promoting apoptosis (9) - the killing and engulfing of debris or a damaged cell by white blood cells. They have antiviral capability. (31) They also act as antioxidants and help reduce levels of oxidative chemicals. (19) Hydrolyzable tannins also act as COXII inhibitors (20) as do other antioxidants (last post).

Tannins are typically found in tea (tea leaves) and other tree leaves such as Sassafras leaves made into Gumbo File or Bay Leaves that are added to a soup broth at the beginning of cooking and removed before serving the food. Condensed tannins don't bind with water and are even more prevalent in leaves, making up as much as fifty percent of the tannin content within leaves of most plants. (12)

Oak leaves are also a source of tannins, and are traditionally used to "tan" hides - with the tannin rich oak leaves. The initial soaking process with the tannin rich leaves prepares a deer skin so the hair can be scraped off the leather hide more easily - it still is a lot of work to tan a hide in the traditional way. Oak barrels are used in the aging of wine and liquors possibly because of the gradual addition of tannins to the aging alcohol product.

Walnuts also have hydrolyzable tannins and the binding of water and other nutrients is visibly noticeable when walnuts are cooked with sweet potatoes in a casserole - the dish can turn brown in color instead of the pretty orange color of sweet potatoes. It has not turned bad, it has hydrolyzed the tannins. The hydrolyzed tannins bind with other nutrients too and can slightly reduce nutrient availability for absorption out of the intestines, (15), - however if the goal is to heal inflamed and painful intestines than having more nutrients stay in the intestines may be part of the benefit - literally reforming the mucus lining of the GI tract that would be continually lost when severe watery diarrhea is an all day problem.

A larger quantity of tannins can also be obtained from pomegranate peel. The white inner part of the peel has slightly less than outer peel which makes it less bitter in flavor and less of a diuretic. Tannins have a diuretic effect and a larger serving of pomegranate peel products can have too much of a diuretic effect. I use a vegetable peeler to remove the outer reddish-purplish rind and then I separate the white membrane from the seeds and trim away any bad spots from the white membrane and remove any discolored or spoiled seeds.

The white membrane of the pomegranate peel can be minced and added raw to a salad or added to a soup. In foods that are acidic the color of the membrane and the dish you are preparing will become more reddish in color or might turn brownish if the tannins are hydrolyzing with other ingredients and the water content. In foods that are alkaline the color will turn brown. This is least noticeable in black bean soup, white beans will have a brown broth and greenish split pea soup looks odd (warning - foods are chemistry and this is kind of fun).

The red part of the peel can be used in tea or to make a liquid concentrate that is used in small amounts but it is too bitter to eat and the diuretic properties can be potent - have the extract or tea early in the day and drink plenty of water throughout the day to help it pass through before you hope to sleep through a night. Why would you bother then? Pomegranate peel has a long list of medicinal benefits potentially including cancer treatment or prevention. It is antimicrobial, anti-worm, etc, a long list, see this webpage for health benefits, preparation and menu ideas: [G13: Pomegranate](#). A bean soup recipe using dry beans is the last recipe on page, [G8: Cookies and Bean Soup](#).

Disclaimer: Opinions are my own and the information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes.

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Eucalyptus, Eyebright, Feverfew, Gentian, Hawthorn, Hops, Horse chestnut, Juniper, Marshmallow, Meadowsweet, Nettle, Pilewort, Plantain, Poplar, Prickly Ash, Raspberry, Rhubarb, Sage, Sassafras, Saw palmetto, Skullcap, Slippery elm, St. John's Wort, Tansy, Thyme, Uva ursi, Valerian, Vervain, Willow, Witch Hazel, Yarrow, Yellow Dock.
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End of Reference List - ACE2, Diarrhea

Immune support against viral infection.

March 12, 2019

The concern about the Coronavirus outbreak is valid as the infection seems more dangerous than a winter flu season. People who smoke or have a chronic lung condition, or are elderly or have other chronic conditions, or who are obese, may be at increased risk of having a more severe case of Coronavirus.

*This blogpost is continued in a longer [podcast](#) / [transcript](#), *Fear and Immunity*.

Symptoms can be non-noticeable or similar to a cold or mild flu. Digestive symptoms might occur in addition to lung symptoms, dry, non-productive cough, and chest pain, hot and cold feverish chills, and extreme tiredness. Smoking increases risk of lung symptoms developing into pneumonia. Recovery seems to take longer than for a cold or flu with some people needing

hospital care for weeks with a ventilator for breathing. ([World/national Coronavirus Statistics](#)) Approximately 2-14 days from exposure to symptom onset, gradually developing symptoms with a cough and chest discomfort, fever, and shortness of breath/difficulty breathing being common symptoms. ([Graphic by Robert Roy Britt](#))

Some people may be infectious without having developed symptoms yet, or at all possibly for the 20-29 year old age bracket based on South Korea's more extensive testing of their population. ([graphic-South Korea & Italy rates of COVID-19](#))

People seem to be most contagious before symptom onset and in the first week of illness. ([link](#)) Twenty days infectious is average and generally is reduced by the time coughing symptoms are over. Thirtyseven days infectious is the longest measured. ([Zhou et al., 2020](#)) Wearing a face mask while infectious might help protect others but is generally not recommended as necessary for people who are not sick. A Public Service video about reducing rate of infection by hand washing, staying home, focusing on not infecting others while we don't know who might be contagious but not showing symptoms yet. ([@thejuicemedia](#))

Contagion risk also seems worse than the flu or a cold as the virus can survive on surfaces longer than average, possibly a week or more. Respiratory droplets may be the usual route of infection however there also may be a risk of infection from an infected person's bowel movement. Thorough hand washing with soap and plenty of water is more likely to disrupt the cell membrane of virus and remove them physically than depending on hand sanitizers which are designed for bacteria not virus.

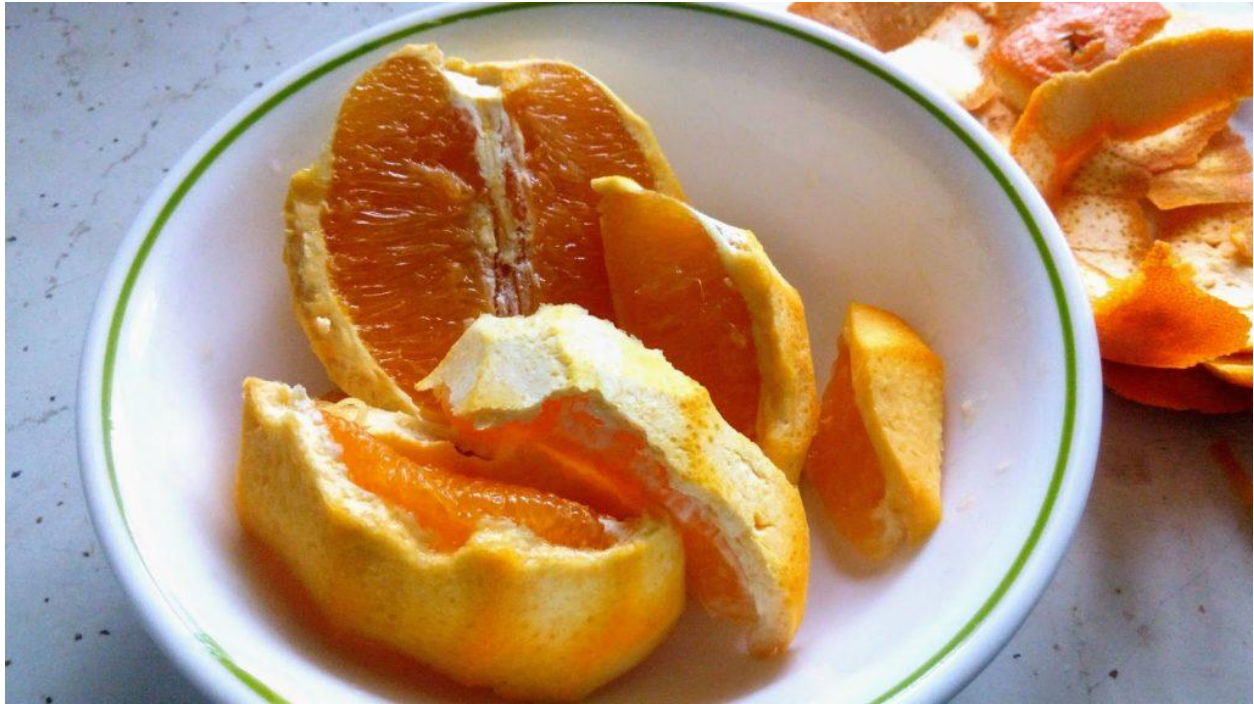
Alcohol in the hand sanitizer may also be drying to the skin which also can increase risk of open sores which can allow infection to enter the body more easily. Moisturize with a hand lotion while the skin is still damp to seal in some of the water. Hand lotions don't replace moisture, they add to an oily coating on the skin that helps prevent moisture loss.

Strengthening Immune Function - food and nutrients, rest, and water, cut down on sweets, increase positive thinking & stress coping habits.

*Nutrition is not a guarantee of not becoming infected with something but it can increase the likelihood of not becoming infected or not developing as severe symptoms, as seen in the Ebola outbreak ([see embedded link](#)) and with research on vitamin D and respiratory infection rate ([see video link](#)).

- Sugar and high fructose corn syrup generally reduce immune health and may provide simple calories that support infectious microbes more than our own health. (*Defeating the Coronavirus with Immunity & Hydrotherapy*, Dr. Eddie Ramirez, [Youtube](#))
- Sleep helps the body recover and cope with healing or fighting infection.
- Water is essential for the body to be able to have a thin protective layer of mucous in which white blood cells can more easily find and remove infected cells.

- Positive feelings of hope and love are more likely to support health than fear and anxiety. Doris Day's attitude in the song lyric may be more helpful, "*Whatever will be, will be, que sera sera*," along with common sense health habits.
- Vitamin C and/or zinc lozenges may be soothing for the throat and help immune function. Elderberry is also rich in antioxidants and may also be available in immune supporting lozenges.



The orange zest layer of the orange peel can be trimmed to leave the white pith to be eaten with the sweet orange wedge. The white membrane is a source of nobiletin.

- The white pithy membrane of an orange peel has beneficial phytonutrients and is also fairly mild like the inner peel of a pomegranate. Use a vegetable peeler or sharp knife to trim off just the outer layer of orange zest and then the sweetness of the orange sections will taste okay along with the white membrane.
 - The orange peel pith contains a phytonutrient, nobiletin, that may help with weight loss too. (*Orange Juice Molecule May 'Drastically' Reduce Obesity, Arterial Plaque*, slashgear.com)
 - Nobiletin is a chemical that promotes our circadian cycles and may be protective against metabolic syndrome. Genetic studies on animals suggest that differences in the CLOCK circadian protein can cause symptoms of metabolic syndrome - obesity, high blood lipids and blood sugar, low insulin levels, fatty liver, and respiratory uncoupling. ([He, et al, 2016](#)) Respiratory uncoupling changes the way mitochondria produce energy and if the changes continue for long may lead to worse dysfunction of the mitochondria which may lead to cancer ([Seyfried, et al, 2014](#)), or other chronic health problems. ([Ruiz-Ramirez, et al., 2016](#)) Research

- with nobiletin as a cancer treatment suggests that it stops cancer growth by deactivating cancerous genes. (plantmedicines.org)
- Orange peel extract has also been studied for use against Coronavirus and it helped reduce replication of the virus. ([Ulasli, et al., 2014](#))
- Chen Pi, dried tangerine peel, is a traditional Chinese medicinal product sold as an anti-viral and digestive support. (alibaba.com/Chen Pi) Improving bioaccessibility of nobiletin with peanut protein nanoparticle encapsulation, for anti-cancer potential as a medication: ([Ning, et al., 2019](#)) Chen Pi is traditionally used as a digestive aid and for respiratory conditions that involve too much thick mucous. Chen Pi is thought to help thin the mucous and promote a more productive cough. (esgreen.com/Chen Pi)
- Other immune supporting nutrients that may help against a Coronavirus infection include Nrf2 promoting sulfarophane and resveratrol. Elderberry is a good source of anthocyanins and other antioxidant phenols, blueberries and black beans would also be rich sources. Zinc and selenium are minerals with antioxidant function. ([selenium sources](#)) Having adequate Vitamin A and D is essential for immune function. NAC and lipoic acid are antioxidants. Nrf2 pathways increase our own internal production of antioxidants. (Other foods: [Nrf2 Promoting Foods](#))
- Both high dose vitamin C and zinc are listed as potential therapeutics for treatment of patients with COVID-19 and Chloroquine, the anti-malarial that was found helpful for treatment of the infection in China, is a zinc ionophore. ([14](#)) Zinc ionophores help with autophagy and apoptosis - the killing and engulfing of infected cells by white blood cells. ([15](#))

Cytokine Storm Syndrome & Vitamin C Infusion, -- webinar for medical professionals.

An over-reaction of the immune system called Cytokine Storm Syndrome or sepsis shock can be the cause of death from COVID-19 infection rather than the breathing problems and pneumonia symptoms. Some people may be more genetically at risk of having the inflammatory over-production of cytokines. ([Cytokine Storm Syndrome/genetics](#)) They are involved in killing infected cells but an excess can cause organ failure and lead to death. Intravenous Vitamin C Infusion can be safe and nontoxic for treating sepsis shock ([Fowler 2014](#)) and may improve survival rates ([ScienceDaily](#)) and is a strategy that was used in Wuhan, China for COVID-19 patients. ([Video update by Dr. Cheng](#)) (Clinical Trial/[Peng](#)) ([Protocol used in China for Vitamin C Infusion IV treatment](#)) ~~A free webinar for medical professionals is being offered March 26 regarding Intravenous Vitamin C Infusion for COVID-19 treatment, [see this for registration information](#).~~ The webinar is now available as a video that can be viewed at any time, see the website: isom.ca. The Vitamin C Infusion technique is being used for COVID19 patients in a large hospital chain in New York, based on the improved survival rate seen in Shanghai China, ([NYPost](#))

Patients from Wuhan with COVID-19 who were in the ICU had more cytokines, ("IL2, IL7, IL10, GSCF, IP10, MCP1, MIP1A, and TNFα.", ([Huang, et al. 2020](#))), than patients who weren't sick

enough to be admitted to the ICU. Other possible guidance to check for cytokine storm besides the cytokine levels is C-Reactive Protein and serum ferritin levels. ([Teachey 2016](#)) The medication Anakinra may be treatment. ([comment](#))

From a nutrition care perspective - the Nrf2 promoting foods also tend to inhibit the inflammatory NfKb pathway which leads to increased production of TNFalpha and other cytokines.

Chloroquine phosphate, 500 mg BID, was used as a treatment in China per a [comment on a medical site](#). ([Detailed document](#) with specific recommendations, may be helpful medication as a preventive or treatment.) It is an anti-malarial drug. and the virus seems to be interfering with heme in red blood cells, a little similar to malaria taking over red blood cells. ([Dr's summary](#); and [his ref list](#)) Artemisinin is an extract of the herb woodruff that is used to treat malaria. It is available as an herbal supplement. ([nobelprizemedicine/pdf](#))

With a new strain of virus we are learning how to treat it and how it spreads and being brand new, no one has immunity against it. Being a coronavirus puts it in the same group as colds and flus which can mutate slightly and we can catch the illness more than once.

The COVID-19 may also be able to be infectious to people who already recovered. ([LATimes](#)) The cases of reinfection may also be the same infection in the patient seeming to get better and then relapsing again.

Prevention is safest. Wash hands and surfaces thoroughly and regularly. Soap, water, and scrubbing physically helps break down virus membranes and remove the virus from skin and other surfaces. Hand sanitizer is not more effective than thoroughly washing with soap and water. antibacterial ingredients are designed against bacteria, not virus.

Disclaimer: Opinions are my own and the information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes.

"Supplements thought to be useful in the prevention of coronavirus infection include NAC, elderberry, spirulina, beta-glucan, glucosamine, selenium, zinc, lipoic acid, sulforaphane, resveratrol, vitamin D, Bifidobacterium bifidum strain probiotics and sporebiotics. "

- Dr. Joseph Mercola ([Essential Nutrition to Protect Yourself from Coronavirus](#)) *

Origins - not a bat in China, genetically traced to the US around Aug/Oct 2019.

*That link includes some speculation about origins of the current Coronavirus strain - supporting the immune system and reducing infection rate and severity of disease is necessary whether

the strain was from bats in the wild or a lab or from a lab manipulation of a strain from bats - saving lives needs to be a goal now.

([statement from Robert Kennedy Jr](#)) "*He [Taiwan Virologist] demonstrated that only the US has all the five known strains of the virus (while Wuhan and most of China have only one, as do Taiwan and South Korea, Thailand and Vietnam, Singapore, and England, Belgium and Germany), constituting a thesis that the haplotypes in other nations may have originated in the US. Korea and Taiwan have a different haplotype of the virus than China, perhaps more infective but much less deadly, which would account for a death rate only 1/3 that of China. [*so infection rates from South Korea may not be represent the risk for all ares] Neither Iran nor Italy were included in the above tests, but both countries have now deciphered the locally prevalent genome and have declared them of different varieties from those in China, which means they did not originate in China but were of necessity introduced from another source. It is worth noting that the variety in Italy has approximately the same fatality rate as that of China, three times as great as other nations, while the haplotype in Iran appears to be the deadliest with a fatality rate of between 10% and 25%. (7) (8) (9)*" ([globalresearch.ca](#)) ([news stories](#)). ([transcript of a video](#)) There seems to be at least two strains, more information is needed to understand the significance of that ([abcnews.com](#)).

Reference List - incomplete, see links within the blogpost also.

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End of Reference List - Immune Support

NSAIDs are COX1 and COX2 Inhibitors, while Antioxidants are COX2 Inhibitors

March 18, 2020

The mechanism involved in why NSAID medications like ibuprofen have been found to not help with treatment of COVID19 and may worsen the patient's health instead has not been stated, however it likely involves COX1 and/or COX 2 inhibition.

NSAID medications (like ibuprofen and aspirin) or phytonutrients that act like NSAID medications (like wintergreen berries which contain methyl salicylate, chemically similar to aspirin, (3)) can be a cause of edema due to the COX 1 and COX2 inhibition effects of the drug.

(1) The COVID19 virus is known to cause lung edema even in the early stages of the infection process before the symptoms are obvious. (2)

*Addition, an CDC/MedCram Update: *Coronavirus Pandemic Update 40: Ibuprofen and COVID-19 (are NSAIDs safe?), trials of HIV medications*, (7), includes the mechanism and controversy. Ibuprofen's inhibition of COX2 would lead to a reduction in antibody production which wouldn't help fight an infection, but it might also inhibit viral replication - net result, not sure whether to recommend using or not using it. Too large a dose might increase risk however. Aspirin has more activity than COX2 inhibition so it might be more of a risk for causing lung edema, especially if taken in large quantity. In the flu pandemic of 1918 a large increase in death rate occurred shortly after aspirin, a new medication at the time, was being recommended and in doses that are far larger than would be typically used now. (7)

(I was eating wintergreen berries in quantity,* 1/8-1/4 cup when I had problems with leg edema. They are botanically related to cranberries and are similar in tanginess and texture but taste like wintergreen/mint when raw. The wintergreen flavor isn't retained after being cooked. *Don't try this at home. ;-)

Antioxidants can also be COX2 inhibitors (4) which can also be a cause of edema. Larger doses of a NSAID medication or phytonutrient would be more likely to cause fluid and sodium retention by the kidneys and lead to swelling due to edematous fluid build up in extracellular areas of the body. Non-selective NSAIDs inhibit both COX1 and COX2 and selective NSAIDs were developed that only inhibit the COX2 enzyme. (5)

We do need extra antioxidants during stress and infectious processes because the body is using them in greater quantities. We would also likely not be able to make as many of our own internally because our bodies would be dedicating more effort to making inflammatory cytokines to fight the infection. Too many inflammatory cytokines can become a problem though and providing extra antioxidants in the diet can help protect the body during conditions of infection such as a severe influenza. (6)

Dose makes the cure, dose makes the poison.

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End of Reference List - NSAIDS are COX1 and COX2 inhibitors

Pomegranate extract update - has similar mechanism to NSAIDs

August 3, 2018

Update, 8/18/2018, for anyone interested in phytonutrient biochemistry or herbal medicinal foods: Wintergreen and wintergreen berries are also a natural source of a painkiller in the NSAID group - aspirin. The plant can also be a source of phytonutrients that activate TRPA1 channels which can affect fluid balance and other symptoms. Winterberries are in the cranberry family and have a minty flavor. They are in season currently and eating more of them seems to increase my symptoms of inflammation and swelling more than the pomegranate extract or pomegranate seeds. Having too many variables in an experiment makes it unclear which factor might be a cause or if both may be involved. Experimental method tries to narrow variables to one factor at a time. Stopping both pomegranate products and wintergreen berries helped but other symptoms got worse, adding pomegranate back to my diet didn't make the inflammation/swelling symptoms much different but more recently adding the wintergreen

berries back into my diet did make the symptoms of lower leg inflammation/swelling and pain worse.

An excerpt from one of my other websites, G3.6.1.5: *People with overactive TRPA1 channels may be sensitive to:*

- “(Winter-green),” (G3.67); Wintergreen is a natural flavoring herb in the mint family. It is typically used as an essential oil as a flavoring in many foods and other types of products. It has medicinal benefits related to it containing the chemical that acts as the pain killing ingredient of aspirin.(G3.73) ([effectivecare.info_G3](http://effectivecare.info/G3))



My ongoing self study of pomegranate extract for my mental and physical health symptoms has led me to use a fairly small dose, daily though is still best. Missing even a few days seems to increase mood and anxiety problems but using a very large serving has some side effects. Lower leg and foot swelling is associated with some physical health problems but it can also be a side effect of NSAIDs pain killers such as ibuprofen. (7) Pomegranate extract has been shown to reduce pain and inflammation by the same mechanism as NSAIDS - inhibition of cyclooxygenase enzymes (COX1 and COX2, with more inhibition of COX2 than COX1). It also may have an anti-inflammatory effect by reducing inflammatory cytokines that signal increase in production of Nitric Oxide (NO) and Prostaglandin E2 (PGE2). (1) Prostaglandin E2 is made from arachidonic acid and is involved in the inflammation associated with rheumatoid arthritis and osteoarthritis. (2) Nitric oxide can be beneficial but it can also transform into reactive oxidative species and add to the antioxidant burden of metabolism. (5) (9) Other studies including an animal study on obesity found pomegranate extract reduced inflammatory biomarkers and increased nitric oxide, which might make it helpful for Metabolic Syndrome. (6)

Pomegranate extract was found helpful in a dose related level against mammary tumorigenesis in an animal study, (0.2-5 gram/Kg body weight was used). Reducing COX2, heat shock protein 90 (HSP90), nuclear factor-κB (NF-κB) pathways, and increasing Nrf2 pathways were found to be part of the mechanism for benefit. (4) That amount could be quite a lot. Equivalent amounts for a 75 kilogram/165 pound human would be 15-375 grams per day or roughly one tablespoon

(15 grams approximately)-13.4 ounces/27 tablespoons per day. (Mammary tumerogenesis means the initial onset of breast cancer tumors.)

It helps to prop my feet when sitting or even lay down with my feet above my heart. I'm getting better at typing while laying down. Better mood and having feeling in my fingertips is worth it. There may some other health or diet issues affecting the leg swelling. Heart or kidney or vein problems can be a cause. (7) I do have vein problems and may have heart issues, which can be an increased risk with hyperthyroidism. Cutting back on salt, daily exercise, and elevating the lower legs above the level of the heart several times per day for a half an hour is recommended, wearing compression socks is also a recommendation and that makes me feel old. (7) Maybe 52 is old.

Lymphedema - lower leg swelling due to reduced drainage from vein problems may be the best fit for my personal history, and lack of stretching exercises lately may be part of the reason the problem has become worse lately. Physical therapists explain the problem and provide exercise, massage and compression wrapping suggestions in a free video available online. (8) The exercise routine is similar to what I generally do when I do stretching exercises - so that seems like a good habit to return to my daily schedule.

Lower leg swelling has been a symptom for me at various stages of previous ill health and with some other medications I've used in the past, but currently it does seem worse when I use larger amounts of the pomegranate extract. One teaspoon a day helps with the stable mood and I haven't had numbness in my fingertips in months with the ongoing daily use of pomegranate extract in larger amounts, 2-3 tablespoons was typical. I stopped use of it altogether when the leg swelling became a problem to see if the swelling would get better but the mood symptoms got worse again after having seemed fine for quite a while - quite a while while using pomegranate extract daily and the leg swelling didn't get a lot better. Being not well is unpleasant and some side effects can be better than being unwell.

Breast cancer treatments currently may cause hair loss, severe vomiting and may leave the patient with cognitive decline afterwards, and pomegranate extract doesn't cause any of those symptoms in the amounts that I've tried. It is a diuretic and causes increased urination which I cope with by drinking extra fluids and using the pomegranate extract early in the day rather than at night. I may be preventing breast cancer tumor development (4) while drinking extra fluid and urinating in increased amounts - getting old isn't great but the alternative isn't better. I may go buy my first pair of compression socks and feel young at heart if not in body.

Industry math - one pomegranate peel makes about six cups of extract by my method which would provide 288 teaspoons/96 tablespoons. It may have improved somewhat but the worsening in mood was more obvious. From an industry perspective getting 288 servings of a mood and nerve treatment from one pomegranate peel seems like it could be profitable. Dehydrating one teaspoon into a capsule serving also seems possible. Side effects with

psychiatric medications are unfortunately common and can include swelling/edema of the lower legs or more severe edema including facial edema.

/Disclaimer: This information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes./

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<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5452166/> (4) From Abstract: "Mammary tumor samples were harvested from our previous chemopreventive study in which PE (0.2–5.0 g/kg) was found to reduce mammary tumorigenesis in a dose-dependent manner. The expressions of COX-2, HSP90, NF- κ B, inhibitory κ B α (I κ B α) and Nrf2 were detected by immunohistochemical techniques. PE decreased the expression of COX-2 and HSP90, prevented the degradation of I κ B α , hindered the translocation of NF- κ B from cytosol to nucleus and increased the expression and nuclear translocation of Nrf2 during DMBA-induced mammary tumorigenesis." From Introduction: "During the last decade, pomegranate fruit has been gaining a widespread reputation as a dietary supplement as well as a functional food due to emerging scientific evidence on potential health benefits, including prevention and/or treatment of cardiovascular ailments, neurological disorders, oncologic diseases, dental problems, inflammation, ulcer, arthritis, microbial infection, obesity, diabetes, acquired immune deficiency syndrome and erectile dysfunction [4,5,6,7,8,9]. Pomegranate fruit contains phytochemicals, including flavonoids (e.g., anthocyanins and catechins), flavonols (e.g., kaempferol and quercetin), flavones (e.g., apigenin and luteolin), conjugated fatty acids, hydrolyzable tannins and related compounds which are thought to be responsible for various biological and pharmacological activities [4,10,11,12,13,14]. Based on preclinical and clinical studies conducted by various laboratories worldwide, pomegranate-derived substances, such as juice, extracts and phytoconstituents exhibited cancer preventive and therapeutic effects against colon, liver, lung, prostate and skin cancer [4,15,16,17,18]. Various extracts, fractions and phytochemicals from pomegranate fruit,

peel, seed and flower demonstrated cytotoxic, antiproliferative, proapoptotic, antiangiogenic, anti-invasive, and antimetastatic properties against estrogen receptor-positive and -negative breast cancer cells

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Cytokine Storm, SIDS, autism and Vitamin C

The over-reaction of the immune system to any infectious stimulant whether an infection or vaccines, may be a cause of Sudden Infant Death Syndrome (SIDS) (1) and the encephalopathy (2) that is a frequent factor in later development of autism. (3)

Sudden Infant Death Syndrome may be a toxin overload as success was achieved with mattress covers in Australia that prevented volatile chemicals or mold spores from reaching the baby. Crib mattresses often contain vinyl or fire retardants and a used mattress likely has mold even if not obvious. It can be healthy for infants to sleep on their belly as helps with even muscle development and skull shape. Babies that are held

or left in the same position all the time can development flattened areas on the skull and limit muscle development. See previous [post1](#), [post2](#), [post3](#).

Giving infants and children vitamin C prior to vaccines orally with juice may be protective against the harmful excess production of inflammatory cytokines. Giving a larger amount intravenously for adverse reactions may also be protective against the cytokine overreaction from worsening as the larger amount of vitamin C has an inhibitory effect on the production of them as well as helping as an antioxidant to detoxify the ones already made in excess. Giving extra vitamin C before vaccines was found to be protective even in lab animals that genetically can make vitamin C. (4)

Cytokine Storm over-reactions may be more of a risk due to genetic differences in as many as 10-15% of the population. (5) Symptoms of a Cytokine Storm reaction can include: *"high fever, enlarged spleen, excessive bleeding, low counts of all types of blood cells (red, white and platelets) and, potentially, multiple organ failures."* (5) Diarrhea is unpleasant and can kill if it continues for long however multiple organ failures is more deadly.

Providing vitamin C as a protection against the risk of an overreaction of the immune system would be low cost and has had a low risk of side effects. Diarrhea occurs if excess is taken by mouth so there is little risk of too much being absorbed in the GI tract, and adverse reactions to higher doses of vitamin C given as intravenous therapy have not been prevalent (1%) in studies using the treatment as an addition to chemotherapy treatments. (6)

"Phase I studies of IV C alone & in combination with chemotherapy have reported excellent safety profiles 1–8,33. A survey of providers who used IVC for 9328 patients reported an adverse event rate of 1.0% 68..side effects of IVC...nausea, dizziness, dry mouth, perspiration, & weakness. 6,7" (6)

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Giving vitamin C to infants and children would be providing them with a nutrient than most animals can produce for themselves. Humans had a genetic change that caused a loss of the ability. Giving vitamin C to infants and children might also help protect against a potentially fatal or brain damaging over-reaction of the immune system. If 10-15% of the population are genetically more at risk for the excess production of cytokines, (5) , then a government policy that mandates vaccinations would be genetically targeting those individuals for increased risk of an adverse reaction or death - a genocide.

Learning more about the gene differences involved in the increased risk for a Cytokine Storm reaction, and screening the population for the genes would also be helpful so those individuals would know that they have increased risk of death if they have an infection or strong immune reaction to something.

The Committee to Review Adverse Effects of Vaccines who were asked to assess the research on autism and vaccines did not say there was no risk of autism from vaccines - they said there was a lack of evidence - that more research was needed.

"The committee particularly counsels readers not to interpret a conclusion of inadequate data to accept or reject causation as evidence either that causation is either present or absent. Inadequate data to accept or reject causation means just that—inadequate. It is also important to recognize what our task was not. We were not charged with assessing the benefits of vaccines, with weighing benefits and costs, or with deciding how, when, and to whom vaccines should be administered."

Committee to Review Adverse Effects of Vaccines
Board on Population Health and Public Health Practice, Institute of Medicine (7)

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End of Reference List and additional links

Bitter taste receptors in the lungs & Hesperidin's decongestant properties.

How did citrus peel help my symptoms? In several ways it turns out, potentially. Antiviral actions, decongestant ability within the lungs, and by reducing the risk of blood clot formation within the lungs as the viral load increases and more tissue damage has occurred.

The **antiviral capabilities** were mentioned in previous posts - hesperidin and neohesperidin may act as antivirals in several ways, the vitamin C also, and quercetin can act as a zinc ionophore. Zinc ionophores are like chemical taxi-cabs - carrying zinc into infected cells preferentially where the zinc then disrupts the viral replication. ([this post](#)) No viral replication, no cell bursting to release them to infect other cells, and so on, in an exponentially increasing level of viral load and dead cells for the patient. The dead cell contents can also become a health risk when occurring in too great a quantity for white blood cells to collect it all for safe detoxification and removal at lymph nodes and by the kidneys.

Decongestant action is due to the bitterness of the hesperidin/neohesperidin and probably other bitter tasting phytonutrients in citrus peel. Think of taste or other sensory receptors that can do a variety of different things depending on where they are located and what they are connected to. Receptors are like tiny machines, activate the keyhole/puzzle piece opening with the matching chemical agonist, or inhibit with the matching chemical antagonist, and then the machine will do something if activated, or not do something or stop doing something if inhibited.

Taste receptors on the tongue would be connected to nerve cells that tell the brain a bitter taste or other flavor type was sensed and that information would be used to eat more if hungry for the taste or to stop eating if satisfied. Taste receptors for sweet carbohydrates are much less sensitive, more of the sweet taste is needed to activate them, than bitter taste receptors, by a magnitude of thousands - one or a few molecules of a bitter substance might activate the taste bud in the mouth, while thousands of sweet molecules might be needed to activate the sweet taste receptor. Sour is somewhere in between in the amount of sour molecules needed to activate sour taste receptors.

In other areas of the body sensory receptors may be attached to other chemical pathways instead of to nerves that go to the brain. Within the lungs there are many bitter taste receptors which when activated signal the mucus lining of the lung cells to make thinner mucus and to increase the motion of the cilia. Cilia are hair like or tail like projections lining the cell walls that can all work together in a wave like motion to move mucus and any dust or virus or other infectious microbes up and out of the lungs.

Non-productive cough, a dry cough, feeling like something is in the lungs but you just can't cough it out is part of the typical symptoms of COVID19/SARS-CoV2 infections for people who get sick rather than being asymptomatic carriers*. (*see footnote) To be able to have thin mucus that is protective, able to be traveled through easily by our mobile line of defense - the white blood cells, we need to have adequate water, and electrolytes (ions) within the cells: magnesium and potassium, and outside of the cells: sodium and calcium.

"Mucus is more than 95% water, making water and ions just as important for controlling mucus properties ." (1)

If a person also is having nausea and vomiting and/or diarrhea, at the same time or in progressive stages, then dehydration and electrolyte deficiencies may become a significant problem, even life-threatening if severe. See this post ([ACE2...](#)) for digestive tips, and [this one](#) for a way to bypass malabsorption of magnesium with a topical source that can be absorbed through hair follicles (which is how ancient people would have gotten plenty - fresh water sources used to be rich in magnesium).

To activate the bitter taste receptors that help with forming healthy thin mucus and help activate the wave like motion of the cilia we would need to have some bitter chemicals that match the bitter taste receptors found in great quantity within lung tissue. Hesperidin is a bitter tasting chemical found in citrus peel and neohesperidin, a similar flavonoid, likely is also bitter in taste.

"Hesperidin, a flavonoid present in many citrus fruits, provides an example of a multi-domain compound. This molecule was found to contain eight of the substructures that form the nodes of the tree, and a selection of these are given in Figure 6. Of the eight node substructures contained within hesperidin, only one contains a significant proportion of known bitter molecules." (3)

Anticoagulant action: The vitamin C and flavonoids in citrus peel can also help prevent blood clot formation which in more severely ill patients with COVID19 infections has been found to be part of the mortality risk. (4) Prevention is important - strengthen capillary walls to prevent microvascular damage that can lead to blood collecting and forming clots which then may block larger blood vessels and cause stroke like damage to larger areas of tissue.

More detail about this problem is available in a document with a revised Marik Protocol for treatment of ARDS with Vitamin C Infusion (and contains thiamine, vitamin B1 which may also be needed in greater quantity during a severe infection response, see this document [14](#)). The revision recommendations are based on COVID19 treatment in China and elsewhere - the lung problems are not typical of ARDS and patients likely need more oxygen than pressure from the ventilator support or worse lung damage may result.

(evms.edu/EVMS_Critical_Care_COVID-19_Protocol.pdf)

Important Recommendation for Earlier Treatment for patients suspected of having a COVID19 infection - for homecare/outpatient prescriptions: It is being recommended to the

FDA to fast track approval for preventive, early treatment with zinc and an anti-malarial and an antibiotic that are fairly available and have a long history of use, so risks and dosing have been studied. *"It's important to note that HCQ, zinc, and azithromycin are very well understood drugs with clear safety profiles; they are widely available, generic, inexpensive, and can be scaled rapidly, including to the developing world, which would be expedited by US leadership in recommendations."* More is included in the second half of [this post](#) about the zinc and anti-malarial medication and other food/phytonutrient zinc ionophores which include quercetin. See this document for the recommendation to the FDA: ([Immediate Treatment for Early Stage SARS-CoV-2 Infections](#)). via ([13](#))

Safety considerations of nutrient/phytonutrient Zinc ionophore: Quercetin in very large doses may affect kidney health negatively (I can't find a dose for that) however in an animal based study quercetin was protective of kidney health at a dose that would be about 360-720 milligrams per day for an adult weighing about 160 pounds (5-10 mg/Kg was provided to the experimental animals). ([6](#)) The amount of quercetin used as a zinc ionophore by a Canadian team may be 500 mg taken three times per day during or prior to suspected viral infection - but I can't find the specific dosing. Zinc can be taken in larger amounts (~15-30 mg) for a few weeks but can collect in the body to excessive levels over time. Symptoms of chronic excess might include a decrease in immune function and copper deficiency may occur as the two trace minerals can affect each other (an excess of copper can cause a zinc deficiency). (*Symptoms of excess Zinc*, [7](#))

Bonus - Circadian cycles affect immune function - because bonuses are nice - another way phytonutrients, including hesperidin ([9](#)), may be helping immune function is by tipping the body towards the anti-inflammatory night-time chemistry and away from the daytime, stress response, inflammatory pathways.

And the bigger picture take-home-point from that is sleep is important for immune function and the sleep needs to have a complete blackout level of lighting for the body to be able to switch over to the anti-inflammatory action of an ancient dark night. We make more melatonin if we get some full spectrum daylight during daytime/wake hours and have complete darkness at nighttime - so a sleep eyemask or folded piece of soft clothing like a Tshirt draped over the eyes may help health. During my untested CoV-19 like illness I did have light sensitivity headaches and found sleeping or resting with a cloth over my eyes to be helpful.

Melatonin is a hormone that helps reduce inflammatory pathways that result in increased cytokines, and inflammasomes such as NLRP3 ([10](#)) which has been associated with worse prognosis for patients with COVID19. the role of NLRP3 activity in SARS-CoV (2003 strain) has been a subject of research. ([12](#))

An animal study on oxidative damage from a type of cancer treatment: *"Oral treatment with melatonin gel had a protective effect in the small intestine, which was associated with*

mitochondrial protection and, consequently, with a reduced inflammatory response, blunting the NF- κ B/NLRP3 inflammasome signaling activation." (10)

Inactivating the NLRP3 inflammasome seems to have anti-inflammatory benefits that may help prevent age related changes. It is an area of research being pursued for pharmaceutical development. (11) Sleep masks/pitch blackness during sleep, with the alarm clock and light leaking in the window covered, could help your body inactivate the NLRP3 inflammasome on a nightly basis with no ongoing copay. Options exist and are worth trying in an order of least toxicity risk to greater toxicity risk.

***Asymptomatic carriers:** In some people the virus replicates somewhat but not to the point of much cell damage - not growing exponentially to the point of the patient's life being threatened. Instead the virus seems to just become dormant within some cells and the person isn't even aware they are sick - a symbiotic host/parasite relationship assures the parasite goes on living - in a living host - which is not abnormal, we typically have virus in us that can even provide some health benefits possibly - symbiotic means benefits both the host and the parasite, but not enough is known about this area of study - called our virome, (5), instead of microbiome.

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information that typically would not be used/studied for standard patient care),

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