SARS-CoV-2 (COVID-19):

HERBAL PROTOCOLS FOR THE TREATMENT OF

INFECTION AND POST-CORONAVIRUS SYNDROME

(Updated as of August 20, 2020)

Stephen Harrod Buhner

The illness went on and on. The symptoms changed, it was like an advent calendar, every day there was a surprise, something new. A muggy head; acutely painful calf; upset stomach; tinnitus; pins and needles; aching all over; breathlessness; dizziness; arthritis in my hands; weird sensation in the skin with synthetic materials. Gentle exercise or walking made me worse – I would feel absolutely dreadful the next day.

Paul Garner, Professor of Infectious Diseases, Liverpool School of Tropical Medicine

It's like nothing I've ever seen before.

Nick Caputo, MD

Covid is here to stay.

Thomas Frieden, MD, Former head of the CDC

No one knows how many coronaviruses there are, perhaps hundreds, perhaps thousands. Only seven (at this time) are known to infect people. Four of those (such as one form of the common cold) usually cause only mild to moderate infections. Three are far more serious. They are all members of the SARS group: The original

SARS coronavirus (an acronym for Sudden Acute Respiratory Syndrome coronavirus, aka SARS-CoV, or SARS-CoV-1) which emerged in November of 2002; MERS coronavirus (an acronym for Middle East Respiratory Syndrome coronavirus, aka MERS-CoV) which was identified in early fall of 2012 (and which is spread mostly by camels); and SARS-CoV-2 (aka Covid-19) which emerged in late fall or early winter of 2019.

SARS-CoV-1 is, in its impacts in the body, very similar to acute influenza and at first was thought to be an emerging influenzal strain. The disease was characterized by fever followed by respiratory symptoms and, ultimately for some of the infected, progressive respiratory failure leading to death. Many of those who recovered from the acute phase suffered long term physical damage from the pathogen's effects on, for instance, the lungs, liver, and kidneys. The same was found to be true of MERS. Eventually researchers found that SARS-CoV-1 was in fact a coronavirus and that it had jumped species . . . into us. Later the same was found to be true of MERS.

SARS-CoV-1spread to 26 countries within a few months of emergence, carried primarily by travelers who were infected. But for some reason (there are lots of guesses) it disappeared sometime in 2004. MERS-CoV is still around but has remained pretty much limited to the middle east. But SARS-CoV-2 has neither disappeared nor limited its range. On March 11 of 2020 the World Health Organization declared it a global pandemic.

SARS-CoV-2

I am writing this in August of 2020. The coronavirus pandemic is still ongoing; there is no clear end in sight. Despite early successes, there has now been a viral resurgence in many countries that believed it was under control. Much has been learned about the SARS-CoV-2 since the pandemic began but there is still a great deal more to learn. Nevertheless, even in this short time, herbal protocols have been found to help; the ones that

follow the lengthy discussion of SARS-CoV-2 are based on a depth understanding of how the virus infects people and what it then does in the body and, as well, which plant medicines can subvert those processes and help protect and restore health.

To begin with, while SARS-CoV-2 is an acronym, it is also known as Covid-19 (and sometimes as just ***the*** coronavirus or even SARS-2) which does make things confusing. Regrettably, Covid-19 is also an acronym. It stands for **CO**rona**VI**rus **D**isease of 20**19**, usually written COVID-19 (but also Covid-19). (It doesn't mean that there were 18 Covids before this one.)

Again, SARS-CoV-2 is a coronavirus. Coronaviruses are some of the largest viruses known. They possess some important differences to our most familiar virus – influenza. With SARS-2, the important difference is that it has a very low mutation rate. (Influenza mutates around four times faster than SARS-2.)

Personally, I'm not fond of the word "mutation" when talking about viral genomic innovations. What is more accurate, I think, is that, over time, the viruses evolve (or innovate) by altering their genomic structure. SARS-2 does this much more slowly than many.

Regarding Vaccines

The slow genomic alteration rate is good news though. It means there is the possibility of a vaccine . . . though no one knows how long lasting it will be or how long it will take to create one that works (or if one works at all). As to how long the protection will last? The best guess right now is one to two years – but that is only a guess. This would be longer than flu vaccines but not as long as polio. Some caveats: it is not yet known which of the many approaches being explored will create the most effective vaccine – there are more than one hundred different potential vaccines being explored. Many experts think that having multiple types of vaccines, each of which acts against a different part of the virus, is a good idea. It would mean that there are alternatives if the

virus alters its genome enough so that it is resistant to the initial vaccine used. As the virologist and pediatrician Sallie Farmer comments, “If you only target one little region, that virus is going to find a way to get away from it. It’s why viruses are so successful in this world.”

Most of the vaccines are targeting the spike protein, which the virus uses to attach itself to human cells. A number of the vaccines focus on stimulating the body to create spike-specific antibodies (which researchers speculate will prevent viral spread). Studies have found that combining several different antibody vaccines work far better than a single one in creating immunity to infection. Still, it is not known how long the body will create antibodies in response to a vaccine. Chinese studies of those who naturally cleared the infection found that their antibodies declined, eventually disappearing two to three months after the infection cleared.

While not a permanent solution, using what is called convalescent plasma is showing some promise in treating the infection. Blood taken from recovered patients is (simplistically) stripped of red and white blood cells which leaves (primarily) the antibodies their bodies created to fight the infection. This approach has stimulated the search for synthetic antibodies that can act similarly – and is the rationale for using combination vaccines which create a multi-antibody response. (There is also some speculation that exposure to milder coronaviruses may have stimulated specific immune cells (i.e., T cells) to recognize and respond to other coronaviruses such as SARS-CoV-2. This is possibly why some people don’t have serious infections; it also presents another possible approach to a vaccine . . . intentionally infecting each of us with a milder coronavirus.)

Understandably, there is tremendous political and social pressure to create a vaccine quickly. Many vaccine experts are worried that this will create “a rush to market” that will fail to identify or even recognize the range and extent of the vaccine’s side effects – and there are always side effects. Nor is there any way to know how effective it will be or how long it will last. (As an example, in any given year the flu vaccine’s effectiveness runs from around 9 percent to less than 70 percent, depending on the age of the person getting it and how well

the vaccine matches the current influenza virus.) This is why vaccine trials normally last years, not the months that are being demanded for this viral pathogen. (The HPV vaccine took fifteen years to develop; the one for chickenpox twenty-eight.)

Eventually, a potential vaccine will have to be tested on people. That means subjecting healthy people to injections of new vaccines which may have a range of side effects, including death. Then, sooner or later, people will have to be exposed to the potentially deadly coronavirus to see how effective the vaccine is (if it is a challenge trial). There are a number of ethical concerns about this. And normally, since trials occur in three stages, that is, Phases I, II, and III it, again, usually takes, and should for safety's sake take, years to go through them all – the record so far is four years for the mumps vaccine.

Phase III trials on SARS-2 began less than a year after the Chinese first reported infections from the virus, enabled, in part, by the extensive work that had already been done on a SARS-CoV-1 vaccine. Nevertheless, no one knows how well it is going to work. As James Le Duc, director of the University of Texas Medical Branch's Galveston Laboratory commented, "This is a huge experiment and no one knows how it's going to turn out."

Once a vaccine is in place, there are hundreds of millions doses that have to be manufactured (not a simple process). They then have to be circulated throughout the country to every city and town, doctor and hospital. And finally, hundreds of millions of people have to be vaccinated, all before the pandemic can be brought under control. (And of course, many people will refuse to be vaccinated, which has predictable effects on controlling the pandemic. If the vaccine has unforeseen side effects, or if it is not as effective as believed, or both, more people will refuse to take it. Vaccines have failed for these reasons before.) All this takes time, a lot of time. As Thomas Freiden, MD, a former head of the CDC, put it, "Even with a vaccine, there is no going back to normal anytime soon."

A Rather Frightening Look at What Covid-19 Infection Does to the Body

This particular virus, it is becoming clear, is far more dangerous than first believed. It is also a great deal more aggressive than influenza, to which it has been erroneously compared. And further, it is far more complex and subtle in its actions and much more damaging to the human body during infection than any pandemic respiratory pathogen since 1918. It combines the behavior of stealth pathogens and their associated systemic effects (similarly to organisms such as *Borrelia*, i.e., Lyme disease) with that of some of the more deadly forms of influenza. While primarily thought of as a respiratory pathogen it is becoming clear that the nose/mouth/lungs are only the entry point for the organism. It often spreads outward from those locations, infecting and damaging a wide variety of organs in the body as it travels. This is especially true for those who show no symptoms of infection yet are positive for the virus.

At minimum, thirty percent of those infected have *no* fever, respiratory distress, or cough. They pass through all casual testing processes, believed to be uninfected, and continue to spread the infection. Further, newer studies are finding that children, who tend to become less ill than adults, are far more infected than believed and have a far greater viral load in their upper respiratory system (e.g., the nose) than even those adults who are seriously ill do. (This is apparently true of the asymptomatic who are in their teens, 20s, and 30s as well.) It now appears that they are acting as asymptomatic spreaders of the infection.

At this point it is known that the lungs, kidneys, heart, brain, GI tract, skin, and the blood cells/circulatory system are the main organs affected by the organism. Twenty to fifty percent of people hospitalized for Covid-19 have some form of heart damage or arrhythmias. About twenty percent have skin rashes. Significant blood clotting is occurring throughout the body for many people and this is probably the most serious common problem. As Dr. Jeffrey Laurence, a hematologist at Weill Cornell Medicine in New York City commented, “The number of clotting problems I'm seeing in the ICU, all related to Covid-19, is

unprecedented. Blood clotting problems appear to be widespread in severe Covid." Worryingly, many people in their 20s, 30s, and 40s, without any other symptoms, also have this kind of clotting but it is only discovered after they have a severe heart attack or stroke (which may be brought on by physical exertion or may simply occur on a day that seems like any old day at all).

The virus' preferred attachment point is to what are called ACE2 receptors on our bodies' cells. (I will go into more depth on this later.) Damage to the endothelial cells, which are high in ACE2 receptors and which line blood vessels, veins, and arteries, is far more common than suspected, even in those with mild or no symptoms. This is the main source of the clotting problems people experience – although the inflammatory cascade the virus initiates plays a part as well, as it often does in many different types of microbial infections.

In consequence, it's clear that in addition to the testing necessary to determine if people are infected, a blood test for D-dimer levels is crucial. D-dimer is a fibrin degradation product that is present in the blood after clots are degraded by fibrinolysis in the body. Levels of D-dimer in the blood give a good indication of how pervasive clotting is, especially in those with no symptoms. (Without this, the only other test that can give an indication of problems is the use of an oximeter which measures blood oxygen levels. Healthy readings should run around 96-98 percent. If those levels begin to decrease it indicates problems in lung/blood oxygen exchange. (Oximeters are very inexpensive and can be ordered online – it is a very good idea to get one.)

Neurologists removing large clots from the brains of fairly young people infected with the virus have found that as fast as they remove the clots, more form. Many of those who have died from the virus have been found to have hundreds if not thousands of tiny blood clots throughout the lungs and, many times, in other organs such as the brain and the kidneys.

Damage to the blood vessels close to the surface of the skin is the source of the rash that is now known to be relatively common in around 20 percent of those infected. Infection of the GI tract can present merely as

mild gastrointestinal upset, transient or continuing diarrhea, or bloody diarrhea, vomiting and severe abdominal pain. Damage to the GI tract can be severe. (The virus infects the GI tract, in part, so it can spread through feces excretion.)

Diagnostic imaging of the GI tract of those infected with SARS-CoV-2 (even in those with no pulmonary symptoms) has found severe damage to the bowel in a number people who were admitted to hospitals. Extensive clotting has led to the loss of circulation to portions of the bowel (ischemia) with portions of the bowel becoming necrotic (dead) in consequence. As Rajesh Bhayana notes: “Some findings were typical of bowel ischemia, or dying bowel, and in those who had surgery we saw small vessel clots beside areas of dead bowel” (Palmer, 2020). There is no way, as yet, to determine how many people’s bowels have been seriously affected, virtually no diagnostic imaging of this sort is being utilized at this point in time.

Half of the infected show signs of kidney damage with up to a third needing temporary or permanent dialysis. (Eighty-two percent of those with subsequent kidney damage had no history of renal problems.) Due to the extensive clotting the virus causes, dialysis catheters often clog with clots during treatment and have to be continually cleared from the machines. Kidney failure is a common contributing factor to death from the virus. The virus also infects the endothelial cells of the bladder; it extensively sheds viruses from this location, spreading in expressed urine. The infection in the bladder can lead to recurring urinary troubles such as bladder pain (cystitis) and frequent urination. Proteinuria, hematuria, elevated serum creatine and urea nitrogen have all been reported as well (though in lesser numbers) and still occur for some post-infection “long haulers.”

In the brain, excessive clotting is the source of the mild to severe strokes which sometimes occur. Some of the first signs of this are slurring of speech and difficulty walking. Serious strokes leading to necrotizing hemorrhagic encephalopathy, incapacitation, and death are also being reported. But the impact on the neurological system can be far broader.

Neurological symptoms can run the gamut from mild to severe. Somewhere between one third and one half of those infected display some form of neurological effects. These can be as mild as loss of smell or taste, muscle weakness, headache, nerve pain, depressed levels of consciousness, dizziness, tingling/fizzing sensation, hair and scalp pain, confusion, a sense of not being one's self or as serious as encephalitis, seizures, and long term mental impairment.

This virus, like SARS-CoV-1, apparently attaches to olfactory neurons in the nose. To infect neurons the virus doesn't utilize ACE2 but a different cellular receptor – CD147 – and from there spreads to the brain. (There is some confusion, aka argument, in the literature as to whether or not neurons express ACE2, some say yes, some say no, fisticuffs at 4 behind the playground.) It spreads outward from the olfactory bulb in the brain to regions closely affiliated with that initial site.

Portions of the brain, as well as the brainstem and cerebral spinal fluid all show viral infection. Autopsies have found damaged brain neurons and multi-focal lesions in the brainstem, cerebral white matter, and cerebellum. (Infection of the cardiorespiratory center in the medulla, which has been found to occur, is possibly the reason for sudden respiratory failure in a number of the infected. This may also explain the extremely odd circumstance where some of the infected present with blood oxygen levels as low as 50% – which should cause unconsciousness – show no signs of respiratory distress – aka "happy hypoxia".)

There is no evidence yet of demyelination of the neural structures of the brain, something that often occurs with acute viral infections but research into the neurological impacts of infection is in its early stages – such damage is often seen only weeks or months later. A number of specialists are suggesting that anyone who has had the disease have regular neurological monitoring, perhaps for as long as a year after infection.

Some of those who have recovered still show neurological deficits which seems likely to be a continuing aspect of what is now becoming known as post-coronavirus syndrome (as are various forms of damage to the

kidneys, GI tract, heart, and lungs).

Nearly all the infected show elevated liver enzymes and this can continue for months after apparent resolution of the infection. About one third of those who become ill experience liver problems. The problems are usually mild but in some cases have led to severe hepatitis. The endothelial cells in the gall bladder ducts are particularly susceptible to infection by this virus. This leads to what is called cholangiocyte injury, a bile duct inflammatory condition that can lead to severe damage in the bile ducts. This is the most common serious liver problem. (Post infection, the use of standardized milk thistle seed to protect the liver and normalize its functioning is probably a very good idea.)

The virus does circulate through the spleen and lymph system but there is no data yet on whether it damages that system, or the bones, or pancreas, and so on. Those struggling with post-infection syndrome commonly report enlarged lymph nodes as a continuing problem.

It's becoming clear that the virus may play a far more serious role in the reproductive system than is currently thought to be the case. ACE2 receptors are very high in both ovaries and testicles. They are also high in the uterus, endometrium, and vagina. ACE2 expression also varies with the menstrual cycle and there is tentative evidence that Covid-19 infection or post-infection syndrome can result in alterations in that cycle. But concerns are also arising that the damage to the female reproductive system might be far worse, that is could affect fertility because of viral infection of the ovaries. Very little research is occurring in this area so far, nevertheless, some specialists are recommending that women practice birth control (or abstain from sex) during infection and for at least eight months after infection clears. There is no way to know, at this point in time, the effects of the virus during early stages of pregnancy but ACE2 receptors are highly expressed in the placenta which could lead to serious problems in fetal development. (There have been conflicting reports on whether the virus can transfer to the infant in the womb.) The virus has been found in breast milk and in any event will

easily transmit through touch during breastfeeding.

In men, ACE2 is highly expressed in the testes, in Leydig cells and Sertoli cells. ACE2 is very high in spermatogonia – the early cells that later become sperm. And the virus has been found living quite happily in sperm. Sexual transmission is apparently common and can come via either the male or female. Orchitis (inflammation of the testicles) is a potential long term problem (both from viral infection and so-called autoimmune orchitis). Free testosterone levels tend to be significantly lower in some men who are infected; there is some suspicion, as with ovaries in women, infection of the testicles may damage fertility. However, again, very few studies have been conducted on all this so far.

There are early indications that the virus is damaging endocrine function in the body, that is upsetting its complex hormonal processes. Those experiencing long term post-Covid-19 syndrome have reported problems in endrocrine functioning and at least one group of researchers (Mongioi, et al) have expressed concern about possible long term endocrine-metabolic problems after infection.

Musculoskeletal problems have also been reported by the infected as well as those struggling with post-infection problems. Muscle pain (myalgia) is common in around 60 percent of the infected, and arthralgia (joint pain) in around one-third. Many people, post infection, continue to experience this, usually on a cyclical pattern.

And of course, infection and damage to the lungs can be extreme. The long list of complications that can occur in the body and its organs, both short and long term, are explored in the various sections that follow.

Similarly to borrelial infections, early suspicions are arising that the virus may sequester itself in protected locations in the body only to re-emerge later, after treatment has ceased and the infected person considered cured.

There are scores of people now, in the US, the UK, and throughout the world, who appear to have recovered only to “relapse” days or weeks, even months, later. Further, to make things worse, the symptom

picture continually changes, sometimes with every resurgence. As Paul Garner, a professor of infectious diseases, comments in *BMJ:Opinion* (May 5, 2020), "Every day there was a surprise, something new. . . . I spoke to others experiencing weird symptoms, which were often discounted by those around them as anxiety, making them doubt themselves." (This is typical of those with recurring stealth-type infections – as many in the Lyme community have discovered. They seem better, the disease resurges, fatigue and other symptoms recur and everyone, including their doctors, default to "it's all in your head. This is known as gaslighting.)

As he goes on to say . . .

The least helpful comments were from people who explained to me that I had post viral fatigue. I knew this was wrong. There was a pattern in that period from two weeks to six weeks: feeling absolutely dreadful during the day; sleep heavily, waking with the bed drenched in sweat; getting up with a blinding headache, receding during the day, turning me into a battered ragdoll in the evening.

I joined a Facebook page (Covid-19 Support Group (have it/had it)) full of people with these stories, some from the UK, some from the US. People suffering from the disease, but not believing their symptoms were real; their families thinking the symptoms were anxiety; employers telling people they had to return to work, as the two weeks for the illness was up. And the posts reflect this "I thought I was going crazy for not getting better in their time frame"; "the doctor said there is zero reason to believe it lasts this long". And too, people report that their families do not believe their ever changing symptoms, that it is psychological, it is the stress.

As Luke Harding reports in *The Guardian* (May 15, 2020), "According to the latest research, about one in 20 Covid patients experience long-term on-off symptoms. It's unclear whether long-term means two months, or three or longer. The best parallel is dengue fever, Garner suggests – a 'ghastly' viral infection of the lymph nodes which he also contracted. 'Dengue comes and goes. It's like driving around with a handbrake on for six to nine months.'" Or, as Lynne Turner-Stokes, professor of rehabilitation medicine at King's College, London, puts it (in typically convoluted language), for a percentage of those infected there is a "recrudescence of symptomatology." The virus, in these cases, may be sequestering itself (as Lyme bacteria, and others, do) and then reemerging after treatment – or the organism may be generating a new form that the immune system does not recognize or perhaps the immune system antibodies have become less effective over time.

Some people are testing positive for months and never seem to throw off the infection. As reporter Roxanne Khamsi comments, "One doctor had multiple positive coronavirus tests 90 days out from her initial diagnosis." Some researchers are speculating that there might be people who remain infected for very long periods of time. Virologist Richard Randall, for example, comments that it's not impossible that there might be people who can remain infective for six months or even as long as a year. "Those people may act as seeds or reservoirs for the virus and potentially could be the source of a local outbreak. I am not saying it is happening for Covid-19 because the data's not there. But that happening would not be surprising."

Newer viral research is indeed finding that many viruses can remain active in various locations in the body for many years. And some coronaviruses can remain active in test animals' liver and central nervous system for exceptionally long periods of time. Kenneth Witwer, a molecular biologist at Johns Hopkins University thinks that SARS-CoV-2 sequesters itself . "I still think that this phenomenon is likely explained by a persistent cellular reservoir of low-level replication, not by residual virus particles." (Non-infective viral particles can lead to a positive PCR test.) As he notes, viral RNA degrades very quickly, there is no other reason

for it to be found for months after infection (and thus leading to a positive test) unless new viruses are releasing particles.

Despite the increasing evidence for viral sequestering, some are suggesting that such may not be the reason; it may be reinfection after cure. (This is not uncommon with coronaviruses.) This would mean that previous infection does not confer immunity or that it is of very short duration. (The current speculation by researchers is three months of immunity after infection.) Looking at other coronaviruses: For those that recovered from SARS-CoV-1, immunity lasted for two years; immunity from coronaviruses that cause the common cold fade in a year. No one knows how long immunity to SARS-CoV-2 will last. (In late-April, the World Health Organization issued a statement that it should ***not*** be assumed that previous infection would confer immunity to repeat infections.) Whatever the reason, the possibility of recurring infections and the presence of continual positive test results are bad news.

A lessening number of people are still insisting that the resurgence is simply due to testing failures. This is unlikely to be the sole reason; many of the people who are again showing symptoms *had* symptoms, were then treated in the hospital, recovered, tested as negative, went home, only to develop symptoms again weeks later.

Of additional concern, the virus quite often infects the conjunctiva of the eye (conjunctivitis) where it has been found (in one person) to continue to replicate, and be infectious, up to four weeks after the infection was thought to have run its course. (There were no other symptoms, including fever.) This indicates that the virus could use the eye as a possible source to spread further infections. (Rub your eye, touch somone, and on it goes.) And if all this were not enough, a great many people (between thirty and forty percent of those infected) have been found to be asymptomatic for the disease and yet be silent carriers. People have been known to carry and spread the virus for weeks before symptoms arise (if they ever do) and for up to four weeks after infection is

thought to have cleared (and perhaps a great deal longer).

The true rates of infection and death from the virus are not yet known and probably won't be known for one to two years. The reasons actual figures can't be known for so long is due to a variety of factors. Those are: early, erroneous beliefs about the virus and what it does in the body, very poor tests, low testing rates, and in the US, regrettably, the CDC criteria for both infection and death which nearly always are, and in this instance very much are, far too conservative and limited in scope.

Low testing rates (in the US and in a number of other countries) give a false picture of infection in the general population. Figures change weekly, often in response to complex research papers which are utilizing various forms of statistical analysis. Few of them agree. I have seen figures speculating that true infection rates are ten times official numbers; others insist it is one thousand times official numbers. Speculation about mortality rates runs from .01 percent to ten percent of the infected, sometimes more depending on the age group being examined. In truth, infection and death rates are much higher than the CDC and other sources (irrespective of the country) indicate.

While the elderly (due to simply aging of the body, its immune system, and its organs) and those with underlying conditions (obesity, diabetes, etc) or immune dysfunction are the most likely groups of people to die from the virus, significant numbers of people in their late 20s, 30s, and 40s are also succumbing to the disease. Far more, in fact, than first thought. (Children of all ages are far more susceptible to infection than first believed and while rates are low death is occurring in this group as well.) There are two main reasons for death rates being far higher than is currently thought – though at root it comes down to the same thing, lack of testing.

The first is that, because if its system-wide impacts the virus is causing a great many heart attacks, strokes, and incidences of kidney failure. Unless those who die from causes other than respiratory failure are tested for coronavirus, the listed cause of death is going to be incorrect. Secondly, a great many people are dying

at home. Few of them are being tested for coronavirus. In fact, until recently, unless they had previously been tested for coronavirus and found positive, a death at home was not considered to be coronavirus related.

It is helpful here to look at normal background deaths at home in New York City and deaths at home during the pandemic. Normal deaths at home in that city average around 25 per day. During this pandemic early studies have found daily deaths running from 150 to 275, depending on the week and how diligently apartments are being checked. The true death rate is much higher than believed something that is now being widely recognized. (Most sources are now accepting that true death rates are at minimum thirty percent higher than official figures.)

There is evidence that there are at least eight forms of the virus now in circulation (though I have seen one paper that indicates thirty). Recent studies note that the viral infections on the west coast of the US are apparently from the initial Chinese form of the virus while the infections on the East coast of the US are from a European variant, spread to the US by travelers from the EU. It is currently thought that the European variant, which began in China, became more virulent as it moved through the EU countries and finally into the US. Similarly to other viruses the coronavirus alters its genome in response to environmental pressures. In other words, the virus learns as it goes. It adapts itself to what it encounters, that is the ecology of the people (and countries) they infect and the drugs used to combat them.

While research is ongoing, the generation of more transmissible forms of the virus seems to be a consistent strategy of this particular organism – at least at this time. As Kroeber, et al comment (2020), about their discovery of a more transmissible form:

> *To date we have identified fourteen mutations in Spike [the attachment organ of the virus] that are accumulating. . . . The mutation Spike D614G is of urgent concern; it began spreading in*

> *Europe in early February, and when introduced to new regions it rapidly became the dominant form. Also, we present evidence of recombination between locally circulating strains, indicative of multiple strain infections.*

Phelan, et al (2020) comment that

> *We used 3,958 SNPs to build a phylogenetic tree of SARS-CoV-2 diversity and noted strong evidence for the existence of two major clades and six-sub-clades, unevenly distributed across the world. We also noted that convergent evolution has potentially occurred across several locations in the genome, showing selection pressures, including on the spite glycoprotein where we noted a potentially critical mutation that could affect its binding to the ACE2 receptor. We also report on mutations that could prevent current molecular diagnostics from detecting some of the subclades.*

In other words, besides more transmissible forms, there may be variants emerging that cannot be detected by current tests.

Yao, et al, note that they have found alterations in variants that "show significant variation in cytopathic effects and viral load, up to 270-fold differences" during infection. As they go on to comment, "We provide direct evidence that the SARS-Cov-2 has acquired mutations capable of substantially changing its pathogenicity." While there has been speculation (hope?) that the virus would become less virulent as it moves through the human species, some researchers are doubting that it will occur – at least in the short term. (There is still a great deal of argument about this among researchers, many don't agree.)

There is no other way to say this . . . what we are facing is serious. If the emerging picture of what the virus is doing is borne out, and if it continues to develop more sophistication with the human body and its immune responses, the human species is going to be in for a very bumpy ride.

There is little reason, at this point, to believe that this virus, as SARS did, will just fade away anytime soon. As Michael Osterholm has commented, "We will be dealing with this forever." We will only discover what is true over time, perhaps only over several years. But we are, in fact, in a hell of a mess.

A Deeper Look at What the Organism Does in the Body

As time goes on, much more will be learned about the virus, its infection processes, and what it does in the body. Nevertheless, here is a pretty good view of what is happening. Knowing what the virus does and how it does what it does gives a good deal of information about how best to create and utilize sophisticated herbal (or medical) protocols to intervene in the process.

The virus is primarily spread through the air (inhalation) and transfers during touch between the infected and the non-infected. While it was originally assumed that the virus only traveled on large exhaled droplets (those from coughing for instance) it is now known that it also attaches to tiny aerosol particles that are simply breathed out during respiration. This is why the virus infects certain cellular structures in the nose first – so it can use our breathing to spread from person to person.

Quite often there are no symptoms during the early stages of infection. On average thirty to forty percent of those who are infected have no symptoms. (Nevertheless, this is only an average – in a Boston homeless shelter, 147 people were infected but 88 percent of them had no symptoms; a poultry plant in Arkansas reported that 481 people were infected – but 95 percent of them had no symptoms.)

Some people may begin to feel unwell within a few days, others can go weeks before they do, and some

never feel ill. For most of the infected, there are one to two days during this non-symptomatic period when the virus reproduces in tremendous numbers, promiscuously spreading them in our exhalations (viral shedding). This ensures that, before symptoms appear, it can quickly spread throughout the population. It's a matter of timing. Someone who, during that particularly infectious period, immerses themself in a crowd can infect scores to hundreds of people in what are called superspreader events. (Restaurants, bars, nightclubs, concerts, convention gatherings, church services, warehouses, packed grocery stores, confined workspaces . . . all of these are perfect venues for superspreader events to occur. The more enclosed the space is – and the more poorly ventilated, the more that viral aerosols will circulate within the crowd.)

Infection can, of course, occur at any time during the course of the disease. (Asymptomatic people tend to shed longer, around 19 days versus 14 for the symptomatic.) It is just that during this early period, the virus sheds in far greater numbers – and infection is transmitted far more easily because of this. (Researchers have found that around 80 percent of infections are from superspreaders.) The more virus a person inhales, the greater their chance of being infected. Because the virus is very stable in tiny aerosol mists it can remain in the air a long time and infect people who are quite far away. This has particular relevance for large gatherings in enclosed spaces.

Concern has been raised about infection occurring from touching virus-contaminated surfaces. It isn't known how commonly infection occurs from this. The main areas in which it seems to happen are in small enclosed rooms where those with active infections are sequestered over long periods. Viral concentrations ranged from 55 percent (remote controls for televisions) to over 80 percent on ventilation grates in their rooms. No surface was found free of virus particles. Nevertheless, it is not known if or how many infections in the general population come from surface contact. The main routes are still considered to be inhalation of virus-infected aerosols and droplets and from droplets or aerosols on the hands which then touch the mouth, nose, or

eyes.

Once in the nose the virus looks for what are called ACE2 (**A**ngiotensin **C**onverting **E**nzyme-**2**) receptors. There are about 40 trillion cells in the average human body, a great many of these have ACE2 receptors, the nasal passages are no exception. It is here that it begins to reproduce so that it can spread through exhalations and, as well, to begin to move deeper into the body. Once the virus enters the body, it has millions more options for attachment.

The "spikes" on the virus (famous from the many media representations of them) are the part of the virus which attaches to the ACE2 receptors on the cell. To facilitate this, the spikes utilize an enzyme found on our cells – transmembrane protease, serine 2 (TMPRSS2). This "primes" the virus's spike protein so that it displays itself as a "fusion protein" to the cell via the ACE2 receptors. This allows viral attachment to the ACE2 receptor and subsequent entry into the cell. (The primary herb which can be used to protect TMPRSS2 integrity, and stop the priming, is *Salvia Miltiorrhiza*.) A number of the more infective influenza viruses also utilize TMPRSS2 in this way. (Another intelligent intervention is interfering with spike attachment to ACE2, discussed in a bit.)

Generally, the virus first enters the so-called upper respiratory system (beginning with the nose). There it attaches to ACE2 receptors on certain epithelial cells, specifically goblet secretory cells (which produce mucus) and ciliated cells (which have tiny hair-like extrusions i.e., cilia, which move mucus and particulate matter up and out of the respiratory system). (*Bidens pilosa* is protective of these cells.) The virus utilizes those cells' TMPRSS2 to prime the spike, allowing entry inside. These particular cells possess a large number of innate immune-associated antiviral genes which is leading to speculation that the virus may be using its access to these cells to subvert a healthy immune response. (And, indeed, interferon production does seem to be inhibited early in the infection.)

Once it gains entry into the nasal cells, the virus begins to utilize those cells' structures in order to

reproduce, creating more copies of itself. At this point in the infection there are often no symptoms. Then, for a week, sometimes longer, the virus releases copies of itself from the infected cells. (Tests of health care workers without sufficient protective equipment found that their noses and mouths were full of live viruses which they then exhaled onto every new patient they saw.) The viruses travel outward with the breath (and also infect the hands when you rub your nose) enabling them to spread to other people, passing the infection more widely into the species. And again, exhaled aerosols, not just droplets, can spread the virus, thus extending the range of infection to something like 15 feet, not the six that is suggested for safety.

> ***Note:*** The main purpose of masks is to protect others if we are infected. It is not primarily to keep us from getting infected – though it does in fact help prevent it. (And yes, *if* you don't cover your nose with the mask, you are still infecting people.) For those with underlying lung conditions such as COPD or post-coronavirus problems (which often make mask wearing difficult because of the buildup of CO2 behind the mask), the use of a mask with an external rechargeable air purifying respirator, about the size of a pack of cigarettes (and which is worn on the arm), is a good idea. A tiny pump sends highly filtered outside air into the mask so that breathing is far less impaired than with a conventional mask. I now use a "4WSDKING rechargeable electrical air purifying reusable portable air purifier with HEPA filter" (available from Amazon). It comes with a substantial number of replacement paper masks (which the pump/filter system connects to). The filter is good for 500 hours before replacement is necessary. The incoming air is *very* well filtered, far more than regular masks, and is cooled as it comes into the mask which also makes breathing easier.

The viral infection of olfactory sensory neurons (or their underlying cellular substrate), located in a small area of specialized tissue high in the nose are the reason for the loss of smell that is one of the early signs of infection. There is some conflict over which cells are causing the problem, infected neural cells or underlying support cells in the epithelium. (Tempers among researchers tend to run a bit high.) Olfactory neurons in the nose do connect directly to the brain and are, according to some researchers, one avenue the virus uses to infect the brain.

From the nose the organism begins to move deeper into the respiratory system, infecting goblet and ciliated cells in the throat and bronchi. This is the point where the first symptoms generally appear: slight fever, dry cough, sore throat, head and body aches. From there, the viruses move deeper into the lungs (the so-called lower respiratory system) where their preferred cell is type II pneumocytes (aka, type II alveolar cells). (ACE2 receptors are also strongly present in type I cells as well, but the virus seems to prefer type II; there doesn't seem to be anything in the literature on type I infection.) These cells are common throughout the lung's alveoli (and along with type I), exist in scattered pockets in the bronchioles, and as well in the alveolar ducts.

The alveoli are incredibly tiny, microscopic, grape-like sacs at the end of very tiny, also microscopic, bronchioles. Air travels through the bronchi which diverge into smaller and smaller and still smaller air passages at the end of which are the alveoli. The alveoli have an extremely thin exterior membrane which is covered by a network of incredibly tiny blood vessels. As we breathe in, the alveoli expand much like very tiny balloons, then oxygen (and other gases and volatiles) pass through the thin alveoli membranes into the blood stream, carbon dioxide (and other gases and volatiles) pass from the blood into the alveoli and are then breathed out. There are around 300 million alveoli so there are a great many ACE2 receptors in the lungs for the virus to attach to.

As the infection progresses the immune system responds. White blood cells release activated molecules to fight the virus (cytokine is the general name for messenger molecules, chemokines are specialized cytokines that call immune cells to the sites of infection, but I just call them all cytokines). The alveoli fill up with fluid

(edema) and dead cells which makes breathing more difficult (pneumonia). Coughing, fever (often high), rapid and slow respiration are common. (There are exceptions, some people never show respiratory symptoms.) Blood oxygen precentage falls. Some people experience what is called acute respiratory distress syndrome (ARDS). This is generally accompanied by what is often called a cytokine storm, a massive inflammatory response throughout the body. The oxygen levels in the blood plummet, the alveoli are filled with pus, mucus, white blood cells, dead viruses, and destroyed lung cells. (These are the people most commonly put on ventilators. However, the majority of ventilated people, around 85% on average, die; there is growing recognition that ventilators may not be a proper intervention with this particular infection.) For many people, the damage to the thin cellular barrier between the alveoli and the blood vessels, results in scarring, aka fibrosis. (When the alveoli are damaged, hypoxia, and a state very similar to emphysema occurs. Protecting the cells from this induced hypoxia can help reduce damage in the lungs. *Rhodiola* is specific for this. It prevents hypoxia-induced oxidative damage, increases intracellular oxygen diffusion, and increases the efficiency of oxygen utilization.)

The scarring that occurs is one cause of what is commonly called COPD (chronic obstructive pulmonary disease) or sometimes idiopathic pulmonary fibrosis. This results in long term pulmonary problems. (Because of the scarring, the oxygen exchange is impeded so that oxygenization does not occur efficiently – thus during any event which demands the use of the muscles people run out of breath, often quite quickly. The scarring is often progressive over time.)

It is not known how many people are developing this post-infection complications in the lungs, but it is cause for concern. There is the significant possibility that thousands of people who have apparently cleared the infection are going to experience long term, debilitating impacts on various organs of their bodies which will eventually necessitate continued care the rest of their lives. (Speculation is that a decent estimate is ten percent of the infected, whether symptomatic or not. Since current infection levels are around five million, that would

indicate that there are now 500,000 people with post coronavirus problems, aka long haulers. There are now internet-based long hauler support groups in many countries around the world. A rough, back-of-the-envelope computation shows current U.S. membership in such groups to already be around 100,000 members.)

One the more important interventions during Covid-19 infection is keeping the lymph system working well in order for the immune system to work most effectively. *Salvia miltiorrhiza* – and cleavers, *Galium spp* – will help both the spleen and appendix (which is not a vestigial organ as reductionists have long insisted but an important part of the lymph system) work at optimum levels as well as keeping the lymph nodes clear of infection debris and thus less swollen. (Given that *Ceanothus*, red root, does stimulate clotting – although its actions are offset by other herbs in the protocols I suggest – I would avoid its use during Covid-19 infections.) The less backed-up the lymph system is the more efficiently the body can process the cellular debris that comes from immune activity. This necessity extends to the lungs themselves as they also possess an extensive lymph system with similar nodal structures which are used to regulate interstitial fluid clearance. This system is often impaired during Covid-19 infection, in part through the viral damage to lymphatic endothelial cells. (Lymph vessels are lined with endothelial cells just like blood vessels.) During pathological states where the lung's lymph system is impaired, this loss of lymphatic function itself creates an inflammatory condition in the lungs. Protecting the integrity of the endothelial cells of the lymph vessels in the lungs and stimulating healthy lymph function is important.

In addition to Salvia miltiorrhiza and Galium spp, another herb of note (for the lungs) is *Eleutherococcus senticosus* (aka, Siberian ginseng). It has, among its many actions, the ability to stabilize lymphatic vessels by protecting and enhancing the endothelial cells of the lymph system. The use of the herb, in clinical trials, has been shown to stimulate lymph drainage to such an extent that edema of the lower limbs was "significantly" attenuated at 2 and 4 hours after ingestion." Other herbs of note are: *Scutellaria baicalensis* and

Polygonum cuspidatum which are both highly protective of lymphatic endothelial integrity as well as interfering with cellular invasion by pathogens or the damaging impacts of cytokines. As specifics: both pleurisy root (*Asclepias tuberosa*) and inmortal (*Asclepias asperula*) can help stimulate lymph drainage from the lungs.

During viral infection of the lungs, the microbiome of the lungs is significantly disturbed. This can allow a bloom of what are normally quiescent pathogenic members of the microbiome. This is why during viral pneumonia most physicians will also prescribe broad-spectrum antibiotics in an attempt to ward off pathogenic bacterial overgrowth. Additionally, because coronavirus commonly infects the lower GI tract, *its* microbiome is also disturbed. Crucially, the lung/GI tract microbiome are, in essence, a single interconnected system – what happens in Vegas doesn't stay in Vegas. Of further concern is that pathogenic or antibiotic disturbances of the GI tract microbiome also negatively affects heart function, another organ strongly impacted by the virus. (The daily use of a probiotic is strongly suggested. The cheapest good one is PB8, but those in the $40 to $60 range are better.)

At first it was believed that the virus was a typical, although unique, respiratory pathogen. It isn't. The virus can in many people become systemic, affecting many other organs in the body. This is because ACE2 is widely distributed throughout the body's tissues. As Hamming, et al (2004) noted in their exploration of SARS and ACE2:

> *Since identifying the possible route of infection has major implications for understanding the pathogenesis and future treatment strategies for SARS, the present study investigated the localization of ACE2 protein in various human organs (oral and nasal mucosa, nasopharynx, lung, stomach, small intestine, colon, skin, lymph nodes, thymus, bone marrow, spleen, liver, kidney, and brain). The most remarkable finding was the surface expression of ACE2 protein on*

> *lung alveolar epithelial cells and enterocytes of the small intestine. Furthermore, ACE2 was present in arterial and venous endothelial cells and arterial smooth muscle cells in all organs studied. In conclusion, ACE2 is abundantly present in humans . . .*

Because ACE2 is present throughout the body, the virus can, theoretically, affect any location in which those receptors exist. Again, at this point in time, the lungs, kidneys, GI tract, heart, blood vessels, skin, the eyes and liver/gall bladder are known to be the most common infection sites.

ACE2 is ubiquitous in endothelial cells in all large and small arteries and veins in all the tissues of the body. Smooth muscle cells have them as do myofibroblasts (their infection is possibly the source of muscle weakness during and after infection) and the membrane of fat cells in the organs and everyplace that fat accumulates. The entire GI tract has large numbers of ACE2 receptors: the stomach, duodenum, jejunum, ileum, and the colon. (Viral infection of the GI tract is the source of the diarrhea that many people experience.) ACE2 receptors are present in the basal cell layer of the epidermis, hair follicles (the infection of which may be the cause of hair loss in some people), in and around the sebaceous and sweat glands, and in all the blood vessels that lie close to the skin surface. (This is the source of the skin rash that about 20 percent of those infected report.) The brain has ACE2 receptors as do the bile ducts, lymph nodes, heart, and kidneys. More troubling, because ACE2 receptors are common throughout the entire circulatory system in vessel and arterial walls, blood clotting in the circulatory system has become a serious issue.

Blood Clotting

The blood coagulation problems seem to come from two main impacts of the infection. As the virus spreads through the blood system of the body, it has access to a great many ACE2 receptors on the circulatory system's

endothelial cells. Viruses attach to the receptors, enter the cells, reproduce, and blow the cells apart as their offspring exit. In essence, this is no different than a scrape to the surface of the skin. It's a wound. So, the internal version of a scab begins to form. Unfortunately, this is happening not to one cell but thousands.

Damage to the endothelial cells that line the vessels recruits platelets to that location where they begin to cluster at the point of damage. The platelets initiate the formation of fibrin which forms a kind of net that traps within it more platelets and red blood cells, essentially plugging the wound (i.e., creating a clot, aka the internal form of a scab) in the vessel wall. This is the initial, main cause of the massive clotting in the body – though as mentioned earlier certain inflammatory processes stimulate systemic clotting as well. Because so many cells are affected, there are hundreds to thousands of clots forming throughout the entire circulatory system and, potentially, in every organ of the body.

Given that coagulation (clotting) problems are so extremely common with this infection – as well as the fact that many people appear well but suddenly experience stroke or heart attack – the use of anti-coagulants is, I think, essential. A number of the herbs suggested for use in treating Covid-19 infections are anticoagulant and very specific for protecting endothelial cells from inflammatory damage and/or stopping clotting – *Salvia miltiorrhiza, Polygonum cuspidatum,* and *Scutellaria baicalensis* are some examples. However, I think the daily use of specific anticlotting agents is warranted – whether someone is infected or not. I suggest either lumbrokinase or nattokinase – and yes, serrapeptase will work, too, but it is very weak compared to the other two. (Lumbrokinase is 30 times stronger than nattokinase, 300 times stronger than serrapeptase; I would suggest that only lumbrokinase be used given the excessive clotting the virus causes.)

Again, many people show no symptoms at all but are still experiencing severe coagulation/clotting problems in their circulatory systems. And to reiterate: One of the best ways to determine how much clotting is occurring is to check the blood for D-dimer levels. D-dimer is released during fibrin degradation; the more D-

dimer, the more clotting. Again, all people who are tested for the virus should also be being tested for D-dimer levels . . . but they are not and most probably will not be. Thus the daily use of an anticoagulant such as lumbrokinase is strongly suggested (even if you feel you have no or minor symptoms) as well as checking blood oxygen levels daily with an oximeter. (Those already on anti-clotting drugs, aka "blood thinners," should avoid the use of lumbrokinase or, at minimum, approach its use with caution.)

Immune Disregulation

Nasal goblet cells, which are some of the first cells infected, are involved with initial interferon responses to viral infections. But with this virus, there is considerable evidence that interferon responses are disregulated. During early infection, as soon as the nasal goblet cells are infected, IFN responses are delayed. Later on in the infection IFN activity is often overactive, initiating highly inflammatory cytokine cascades. In the latter situation, there is strong evidence that what is called GMP-AMP synthase (cGAS) and its down stream effector STING (STimulator of INterferon Genes) are overactive during Covid-19 infections. This same dynamic is the source of an unrelated but difficult and painful autoimmune disease called STING-associated vasculopathy with onset in infancy (SAVI). Unsurprisingly, the symptoms it causes bears a resemblance to some of the symptoms that occur during Covid-19 infections.

STING is an adaptor molecule which links sensing of foreign microbial pathogen DNA to the production of type-1 IFNs during the innate immune response. It is expressed in alveolar macrophages, bronchial epithelium, and type II pneumocytes – all SARS-CoV-2 infection sites. STING has a direct effect on endothelial cells, stimulating inflammation and initiating a coagulation cascade. This is in addition to the dynamics already in play through viral attachment to endothelial ACE2 receptors. STING disregulation, caused by the SARS-CoV-2 virus, is at the root of many of the pulmonary, coagulation, and inflammation problems seen both in

Covid-19 infections and SAVI.

SAVI is accompanied by abnormal inflammation throughout the body, especially in the skin, blood vessels, and lungs – idiopathic pulmonary disease is a common problem for children with SAVI. There are also continual problems with blood vessels (vasculopathy) and damage to the tissues that rely on these vessels for their blood supply. The condition causes a chronic vessel-endothelium inflammation which leads to the vasculitic rash common in SAVI . . . but also seen in Covid-19 infections. (This may be the dynamic underlying the unique symptoms in some young children, first noted in New York.) This often extends to the toes and fingers producing a condition which is very similar to what is being called Covid-toe. As with Covid-toe, the rash is not limited to the toes but extends to the sole, sides, and top of the foot and is sometimes accompanied by lesions. JNK inhibitors have been found to help quiet the STING-initiated, overactive IFN activity, reducing the systemic inflammation in the body. (Some plants that inhibit JNK are *Ailanthus altissima, Andrographis paniculata, Aster tartaricus, Eucommia ulmoides, Forsythis suspensa, Glycyrrhiza spp, Lonicera japonica, Magnolia officinalis, Paeonia suffruticosa, Polygonum cuspidatum, Sophora flavescens* – all of which have been found to be useful for treating pulmonary problems similar to those caused by this coronavirus.)

As with Lyme infections, interfering with the production of upstream cytokines during Covid-19 infections can significantly reduce the inflammatory cascades they initiate thus reducing the damage to the body. Xiaobing Deng, Xiaoyu Yu, and Jianfeng Pai (2020, preprint) comment that control of upstream cytokines is a promising strategy in the treatment of Covid-19, with special attention paid to the disregulation of IFN-I which the virus causes early during infection. Stopping the virus-caused abnormal activity of cGAS-STING which is a main source of cytokine overactivation and inflammation is one potential upstream point at which to intervene. The plant-derived cyclopeptide Astin C is particularly potent in accomplishing this. It's a compound from the plant *Aster tataricus* (a highly under utilized herb in the western world) which has been used in Chinese

medicine for some two thousand years. The root is often used to treat lung and bronchial disease, especially chronic bronchitis and coughing. It is considered antibacterial and antifungal (with a good range of action against a number of pulmonary pathogens), antitussive (reducing coughs), expectorant (expressing mucus out of the system), and stimulant. It is particularly good for a number of post-coronavirus problems. (This is not an herb that I have previously used or have experience with – though that is changing – but given its history of use and its ability to inhibit JNK and cGAS-STING its use with Covid-19 certainly should be considered.)

As noted, there are ACE2 receptors on macrophages, monocytes, and lymphocytes, including T-cells. This allows the viruses entry into those cells where they can then affect immune responses. There is growing evidence that like SARS-CoV-1, this virus can also infect dendritic cells and it definitely does interfere with their maturation. By infecting a wide range of immune cells, the virus can lower or inactivate some immune responses and significantly upregulate others. Similarly to Lyme *Borrelia*, it is very sophisticated in modulating immune responses to infection. During early stages, it shuts down significant parts of a healthy immune response which allows the virus to spread and infect widely divergent parts of the body more easily. (As an example, during SARS-2 infection it is common for the body to have very low levels of lymphocytes, a condition called lymphocytopenia. *Houttuynia* is very good at correcting this as well as being a specific antiviral for this particular virus.) Later in the infection, the virus stimulates immune activity, thus causing more inflammation. (Inhibitors for the organisms' actions on the immune system is covered a bit later on.) Some people have immune responses that do in fact quite easily stop the infection, others, apparently very healthy do not. No one knows why. (Reductionists continually fall back on GENETICS! which they use about the same way that our ancestors used "the gods did it" or "it's an imbalance in the humors." The truth is they don't know.)

CD147 and Cyclophilin A

The virus has also been found to attach itself to the CD147 receptor that is present on many cells in the body. CD147 is also known as neurothelin, basigin or, more descriptively, **E**xtracellular **M**atrix **M**etallo**PR**oteinase **IN**ducer (EMMPRIN) since it stimulates fibroblasts to secrete a range of matrix metalloproteases (MMPs) – themselves a source of inflammation and cellular breakdown. (The plethora of names that all refer to the same thing that researchers continually come up with are a constant source of irritation to those of us who use language to communicate.)

CD147 is regarded as a novel modulator of inflammatory and immune disorders and its disregulation has been linked to the pathogenesis of such things as asthma, lung inflammation, hepatitis, myocardial infarction, ischemic stroke, and, importantly, neuroinflammatory diseases – most of which occur during Covid-19 infections.

CD147 receptors are found on olfactory and brain neurons, red blood cells, epithelial cells, endothelial cells, leukocytes, monocytes, lymphocytes, neutrophils, and platelets. It is strongly upregulated on activated immune cells, neutrophils, T and B-lymphocytes, monocytes, macrophages, and dendritic cells. While the virus can use this receptor to gain entry to cells (and does sometimes do so), it appears that a more important aspect is the affinity of cyclophilin A (CyPA) for CD147 receptors.

Damaged epithelial and endothelial cells and macrophages tend to upregulate and release CyPA and CyPA has been found to stimulate CD147 surface expression on cells. CyPA has been shown to facilitate viral replication, including that of SARS-CoV-1. CyPA, when released from cells, strongly binds to the upregulated CD147 receptors. By attaching itself to the CD147 expressed on the surface of cells and simply waiting until it does, the virus gains access to the CyPA which, when released from damaged endothelial and epithelial cells, seeks out CD147 to bind with. When it does so, the virus can utilize the CyPA to facilitate its reproduction.

Viral load then increases substantially.

The cyclophilin inhibitor cyclosporin A has been found to inhibit the replication of coronaviruses. (*Magnolia officinalis* contains magnoloside A which has also been found to inhibit CyPA. It is a traditional Chinese herb used to treat, among other things, lung infections and inflammation.) As well, anti-CD147 antibodies tend to inhibit the virus from attaching to host cells or using that receptor to gain entry into them. (*Scutellaria baicalensis* accomplishes this as well, in part, by downregulating CD147 expression.) Blocking CD147/CyPA interactions during *in vivo* studies of induced acute lung inflammation by the use of anti-CD147 mAb has led to a 50% reduction of neutrophils in within the lung tissues and airways accompanied by a similar decrease in tissue damage (Zhu, et al, 2014).

CyPA is a potent proinflammatory molecule. The more that is released from damaged cells, the more inflammation that occurs in the system. The binding of CyPA to CD147 activates MAPK pathways, stimulates leukocyte recruitment and specifically induces MMP-9 expression through ERK and NF-*k*B pathways, all of which play a role during Covid-19 infections. (Among other actions, *Polygonum cuspidatum* strongly downregulates MMP-9.) CyPA also induces the production of numerous cytokines, e.g., IL-1β, IL-6, and IL-8 in macrophages and monocytes and promotes the proliferation and migration of VSMC. It enhances platelet adhesion and thrombus (clot) formation and activates ERK1/2, NF-κB, Akt, JNK, and p38 MAPK, again, all of which play a role in Covid-19 infections.

Inflammatory Cytokines

Once the virus enters the body it initiates a rapid process of replication which causes massive endothelial and epithelial death (apoptosis) and, because of the endothelial cell damage, vascular leakage. This triggers the release of “exhuberant” (as they say) pro-inflammatory cytokines and chemokines (known hereafter as just plain

old cytokines). These include TNF-a, IL-1β, IL-6, IL-8, VEGF, MCP-1, among others. The viral infection of macrophages and lymphocytes can result as well in a type of apoptosis or cell death called pyroptosis which is by its nature highly inflammatory when it occurs. The virus doesn't generally reproduce in white blood cells but it does actively interfere with their ability to fight off the infection. (See the section on smoking for a bit more on this.)

In addition to attaching to and infecting ACE2 receptors, the virus can also downregulate ACE2 and induce, as they say, the shedding of "catalytically active ACE2 ectodomain" – these guys are great fun at parties. What this does is initiate the loss of ACE2 function in the lungs which tends to create acute lung injury. This loss of ACE2 function often causes dysfunction of the renin-angiotensin (RAS) system in the body. RAS is intimately involved in modulating a number of systems in the body needed for health. As soon as ACE2 reduction or loss occurs, general inflammation in the body increases and vascular walls become more permeable. In the lungs, loss of ACE2 results in more edema, leaking blood vessels, neutrophil accumulation, and diminished lung function.

Protecting and strengthening ACE2 receptors is, I think, essential. Herbs that block viral attachment to ACE-2 linkages are *Glycyrrhiza spp, Scutellaria baicalensis, Sambucus spp, Aesculus hippocastanum, Polygonum cuspidatum, Rheum officinale,* and plants high in procyanidins and lectins (e.g. *Cinnamomum*, i.e. cinnamon). Herbs that upregulate ACE2 are *Pueria lobata*, *Salvia miltiorrhiza*, and *Ginkgo biloba*. ACE inhibitors (in contrast to ACE-2 upregulators) will increase the presence of ACE-2 and help protect the lungs from injury: *Crataegus spp* and *Pueraria lobata* are specific for this. (This is part of the reason *Crataegus*, i.e. hawthorn, is good for heart health, it upregulates ACE2 by down regulating ACE, thus increasing ACE2 receptors in the heart, thus supporting heart health and vitality.)

Tiny Rant: A number of people have expressed concern about upregulating and strengthening ACE2 since the virus attaches to that receptor. Wouldn't it be better, they say, to just inhibit ACE2 in the body completely? Why don't we just get rid of ACE2 entirely? Then we won't get infected. Won't upregulating and strengthening ACE2 lead to more attachment points and more infection? Well, no, it's not that simple. For one thing there are some 4 trillion cells in the human body, a significant number of which have ACE2 receptors on them – including fat cells. The more fat you have the more ACE2. (Needless to say, Americans have a *lot* of ACE2 receptors.) Getting rid of ACE2 receptors is simply not possible, which is a good thing since they are essential for the body to remain healthy. Without them we die. Really really fast.

Secondly and importantly, *herbs are not drugs*. Nor are they even *raw drugs*, which some phyto-semi-rationalists and reductionists erroneously call them. They are plants, which are, at root, only one thing: ecological modulators – both of large systems like the Earth and smaller ones like our bodies. They act to move systems, irrespective of size, back to health, to re-establish homeodynamis – what some people, incorrectly call homeostasis (there are no static states in nature only dynamic ones). And plants are extremely good at their job which they have refined over several hundred million years or so.

Pharmaceuticals, which are a century old or so, are single molecules that force a change in the body of one sort or another. (They come out of a medical system whose approach to disease is based on cut, kill, or force – and now perhaps, to some extent, and very dangerously, reprogram.) They don't usually perform multiple actions. Herbs often contain hundreds of compounds that act synergistically. *Pueraria lobata* (kudzu) does not simply upregulate ACE2. It is more accurate to think of its actions with ACE2 as performing a modulatory and regulatory

> function as part of a much wider range of actions in the body (such as downregulating overactive cytokines like TNF-a and IL-1β and supporting the health and maturation of dendritic cells). It is *not* a single-action stimulant (such as a pharmaceutical) that forces ACE2 expression, nor is it a straight suppressant, depressing ACE. You *can* compare apples and telephone poles, it just doesn't make any sense when you do.

To continue . . . the increase of TNF-a and IL-1β in the system stimulates the "shedding" of ACE2 which results in less membrane-bound ACE2 on the body's cells. This is pervasive throughout the body – the more inflammation, the more shedding. No matter the organ, when this shedding occurs, organ function decreases. (Plants that can inhibit TNF-a include *Andrographis paniculata, Cordyceps spp, Eupatorium perfoliatum, Glycyrrhiza spp, Houtuyynia cordata, Pueraria lobata, Sambucus spp, Scutellaria baicalensis, Salvia miltiorrhiza,* and melatonin, not a plant but useful in this infection for a variety of reasons. IL-1β inhibitors include *Cordyceps spp, Eupatorium perfoliatum, Polygonum cuspidatum, Pueraria lobata, Salvia miltiorrhiza, Scutellaria baicalensis.*)

SARS-CoV-2 can, it seems, infect dendritic cells (DCs), both mature and immature. It doesn't kill them (as far as I can find) but merely stops them from maturing and thus initiating an effective adaptive immune response. DCs exist abundantly just under the epithelium layers in the lung tissue. The cytokine upregulation that infection causes makes the endothelium much more porous, allowing the virus to penetrate and infect the DCs. Upregulated IL-6 and IL-8 from epithelial and endothelial cells concentrate around the immature DCs and strongly inhibit their maturation and the priming ability that mature DCs have for the generation of active T cells. This inhibits the production of active T cells allowing the spreading of the infection. Stimulating DC maturation (*Cordyceps spp, Pueraria lobata*), along with inhibiting cytokines, can help prevent this.

Disregulation of the brain ACE2 and RAS system is intimately related to poorer cardiac function as well as dysregulated hypothalamic function, blood pressure, and autonomic system function. (This is a contributing element to the wide range of neurological effects that are being seen.)

Not to get into it too deeply, ACE2 (i.e., angiotensin converting enzyme 2) antagonizes the actions of angiotensin II (AngII). AngII is involved in modulating immune function. When not controlled by the presence and action of ACE2 it contributes to general and autoimmune inflammation, hypertension, organ and ventricular hypertrophy, the decrease of endothelial progenitor cells which are necessary for vascular repair, and promotes organ damage and fibrosis in the body. The less ACE2, the more those effects occur. ACE2 is *very* important to healthy functioning. ACE2 is powerfully affected by the virus, so, again, the use of ACE2 protectants and modulators that normalize function is, I think, crucial.

The extensive cytokine release in the body causes an ongoing inflammation which can attack most organs eventually leading to organ damage and collapse. Interfering with the generation of the cytokines, which can be accomplished through a variety of herbal interventions, can substantially help the course of infection. For example, some researchers have found that simply reducing IL-6 during a Covid-19 infection will reduce inflammation, making the disease less acute, and enabling a better long term resolution. That is why the arthritis drug tocilizumab, which inhibits IL-6, has been found of use in treating acute Covid-19 infections.

IL-6 and IL-8 are two of the more important cytokines to inhibit as part of Covid-19 treatment. IL-6 plant inhibitors include *Andrographis paniculata, Isatis spp, Pueraria lobata, Salvia miltiorrhiza, Scutellaria baicalensis,* and melatonin (which is often a constituent in many medicinal plants). IL-8 inhibitors include *Cordyceps spp, Isatis spp, Polygonum cuspidatum.* (And just to note: melatonin has good application in this disease, not only as an anti-inflammatory but also because, among other things, it helps reduce anxiety and promote sleep.)

The Heart

As mentioned earlier, the virus does infect cardiac cells via their ACE2 receptors and thus damages heart tissues, including its muscle tissue. Some people so affected have no respiratory symptoms at all and present at the hospital solely with cardiac problems such as a sudden heart attack. At first glance it seemed that perhaps ten percent of those infected with Covid-19 suffered cardiac complications. This is now uncertain. Permanent heart damage is apparently occurring in far more people than at first realized. Many asymptomatic people or those with very few symptoms are finding that even though they are apparently well they now have underlying myocarditis (inflammation of the heart).

Two studies in Germany raise serious issues for long term heart problems in those who have recovered from Covid-19. In one, MRIs of 100 people who had recovered from the infection were compared with 100 similar people who had not been infected. Seventy-eight of the infected were found to have signs of structural damage to the heart, 60 of them had myocarditis. All of them were relatively young. (A second study on 39 people who had died from the infection found that 24 of them had active virus in their heart tissue.) In essence, many people who recover from the disease are going to have long term heart problems from the infection. The heart damage can become serious when the body is put under muscular stress. Several athletes have died after returning to their sport simply due to pressure on the heart from extreme exertion. Examination of others who seemed well have found chronic heart inflammation where there previously was none.

During cardiac infection the initial manifestation is “an increase in high-sensitivity cardiac troponin 1 (hs-cTnl) levels” (Zheng, et al, 2020). As the damage spreads median creatine kinase levels rise to double the levels of those without cardiac infection. In a more perfect world everyone infected with this virus would be tested for those elevated cardiac biomarkers. (They aren’t.)

Herbal interventions are very specific for preventing this kind of damage during infection. In general,

during the pandemic it is a good idea to take heart adaptogen and tonic hawthorn (*Crataegus spp*) as part of a daily preventative regimen. The herb most specific for the damage the virus causes is *Salvia miltiorrhiza*. It is significantly more effective if combined in a one to one ratio with *Pueraria lobata* (Wu, et al, 2007). A combination of *Paeonia suffruticosa* and *Salvia miltiorrhiza* has also been found to be effective (Li, et al, 2016). *Salvia miltiorrhiza* is a truly important medicinal in the treatment of inflammatory diseases such as Covid-19. It has a long history of use in China for the treatment of systemic disease, including reversing or treating adverse impacts in most organs of the body including the heart. It is effective for inhibiting increases in troponin and creatine kinase – again, not a suppressor but as a modulator of function. The herb promotes blood circulation, inhibits platelet aggregation, protects endothelial structures, is anticoagulant, anti-hypertensive, antithrombotic, anti-allergenic, strongly protective of the kidneys, is a potent cytokine adaptogen – reducing any cytokine levels that are too high, increasing any levels that are too low – another way to think of it is as an immune-response adaptogen. It is strongly anti-inflammatory, protects Golgi structures, is neuro-protective, restores mucosal integrity in mucosa-infected cells, is highly protective of the spleen – enhancing its immune functions, and has shown remarkable effectiveness in the treatment of lung disease. In short, a truly world class systemic modulator for inflammatory diseases of any sort.

The world's best herbal monograph (on *any* herb) is the three volume (1800 pages total) compilation by Xijun Yan (editor): *Dan Shen (Salvia miltiorrhiza) in Medicine* (Springer, 2015). It covers every possible use of the herb and looks at both historical use, its outcomes in clinical trials, and in laboratory study. It makes any other herbal monograph in existence look paltry and rather shame-faced in comparison.

Scutellarin and baicalin from *Scutellaria baicalensis* are also particularly effective in treating and preventing heart damage from the virus. Scutellarin prevents the increase of cardiac troponin (by correcting or preventing the underlying damage). Baicalin inactivates creatine kinase. Specifically the herb has a broad range

of cardiovascular actions including vasodilation, protection against ischemia/reperfusion, is anti-inflammatory, anticoagulatory, antithrombosis, protects endothelial integrity, protects the myocardia, stops cardiac remodeling, and possesses antiarrhythmia actions. It is also a strong systemic antiviral herb, specifically so for this particular organism. It has a long use in China for treatment of blood circulatory problems and cerebral insufficiency. (Quercetin and *Polygonum cuspidatum* will also inactivate creatine kinase.)

Additionally, a Chinese blend called QiHong (not findable as a pre-made formulation on the internet as far as I can determine) is very specific for preventing viral myocarditis. It is a blend of equal parts of *Astragalus spp, Rhodiola rosea, Sophora flavescens.*

One final thing: L-Malic acid has been found to be extremely low in the infected; levels become progressively lower as severity increases. L-Malic acid is an essential amino acid in the body when the immune system is struggling with any type of systemic inflammation. This amino acid is rapidly consumed during inflammatory states in order to provide energy and materials for the proliferation of and phagocytosis capacities of immune cells. Supplementing L-Malic acid is strongly suggested, especially during more serious infections. (It can cause diarrhea in high doses.)

Given that long term heart damage is likely an MRI of the heart is indicated for anyone who has been infected and subsequently recovered. Use of heart supportive herbs is highly suggested.

A Brief Comment on Smoking and Covid-19

Despite a great many media articles early in the pandemic that insisted that smokers who contracted the new coronavirus would suffer worse outcomes than nonsmokers, such has not generally been the case. (Initiate hair pulling by prohibitionists.) As Lippi and Henry (2020) comment: “In conclusion, the results of this preliminary meta-analysis based on Chinese patients suggest that active smoking does not apparently seem to be

significantly associated with enhanced risk of progressing towards severe disease in COVID-19." Some researchers are speculating that since smoking reduces macrophage activity it interferes with the systemic inflammatory processes the virus initiates. As Yang and Chen (2018) note . . .

> *A study by Chen et al demonstrated that in smoker's alveolar macrophages, there is a decrease of proinflammatory cytokines including TNF-a, IL-IB, IL-6, IL-8 and reduced TLR-2 and TLR4 signaling as a result of impaired activation of NF-KB.*

These are in fact some of the most active of the cytokines during Covid-19 infection which explains why smokers generally have a better outcome *in acute infections* than non-smokers.

Other researchers speculate that because nicotine has definite effects on the RAS/ACE system (modulating its actions) that *that* is the reason for smokers' better outcomes during infection. As well, nicotine actually prevents acute lung injury in animal ARDS models and has immune modulating actions. (To stop the run on nicotine patches the French government prohibited the sale of over the counter patches until the pandemic subsides. Nevertheless at least one hospital in the EU issued nicotine patches to all its medical workers. . . . always fun to see a prejudice defeated by a deeper prejudice or, in this case, a deeper fear.)

There is, inevitably so, continued conflict on this issue between researchers who have a strong prohibitionist orientation and those who are just looking at the data. Only time will reveal whether smoking lowers negative outcomes during acute infection but at this point in time, it appears that it does due to its lowering the activity of certain cytokines by inhibiting macrophage activity.

Post-Coronavirus Syndrome

There is a growing recognition that many people who have been infected by the virus continue to report severe symptoms for months (and perhaps longer) after their initial infection. These are now being referred to (most commonly) as "long-haulers," that is, people who "should" have recovered but have not. And most of them are relatively young – three in five are between the ages of 30 and 49. (Some continue to test positive for the virus, others do not – false negatives are common in around 30 percent of those tested; there is, as yet, no truly reliable test.) Somewhere between one in twenty and one in ten people are reporting a long term illness. Some have been experiencing debilitating symptoms for as long as six months; no one yet knows how long it will be until they resolve . . . if they ever will.

As Jorge Mercadol, MD, comments, "Reports on potential for long-term consequences have been broad, from blood clots to heart damage, lung damage, and neurological symptoms. While some conditions may be reversible over time, there is growing evidence that some long term effects from COVID-19 may be irreversible."

Margot Gage, an epidemiologist, was infected early in the pandemic, as was her family. Unlike them, she became seriously ill. Five months later, she still has brain fog, seizures, and extreme fatigue. She still can't work. Luckily she found a responsive and knowledgeable physician . . . most have not been so lucky.

As with Lyme disease, many physicians believed (and some continue to do so) that long haul coronavirus problems do not exist. In other words that there is no post-coronavirus syndrome. This is, of course, infuriating to those who suffer from it. As Fiona Lowenstein commented in *The Guardian* . . .

> *Since contracting Covid-19 in March and launching a virtual support group for other patients, I have witnessed first hand the limitations of expert advice for a novel pandemic, and the need for patients to become their own experts and advocates. When my own Covid-19 case morphed and*

> *dragged on for months, I found no expert advice that applied to my situation. . . . Connecting to thousands of other patients helped me discover that my symptoms and "long-haul" condition were not unusual.*

It wasn't until July 24 of 2020 that the CDC to finally issue a statement acknowledging that up to a third of those infected with the virus were suffering long term problems. Prior to this physicians routinely discounted their patients' experiences. (Again, this is an incredibly common experience for many people who enter the medical system, irrespective of the condition they have.)

Carol Holguin, for example, was still experiencing Covid-19 symptoms 130 days after initial infection. Medical providers continually dismissed her when she told them of her condition – even in the early stages of infection.

"'I'm having trouble breathing,' I told the nurse. She inquired about my other symptoms, which included vertigo and light-headedness. But I'd never had a fever above 100.4, so she said I couldn't be tested. Then she told me it sounded like I had anxiety." (Regrettably, it is extremely common for licensed medical technologists with no depth training in psychology to diagnose psychopathology instead of listening to their patients.) As Holguin notes, being refused treatment was a "turning point because I took my health into my own hands." Still, her symptoms continued, often worsening.

Suddenly, months later, she couldn't breathe. Her husband called the EMTs. She told them she was positive for Covid-19 and was sure it was the virus acting up again "but they didn't listen." Later, she comments, "I asked the cardiologist if this could be Covid-19, but he didn't even acknowledge the question."

Hanna Davis, as Ed Yong reports in his *Atlantic* article "Covid-19 can last for several months", told of similar dismissive behavior. As Yong relates, "Davis described her memory loss and brain fog to a neurologist,

who told her she had ADHD. 'You feel really scared: These are people you're trying to get serious help from, and they don't even understand your reality,' she said. Vazquez [another of the infected] said her physicians repeatedly told her she was just having panic attacks . . . Athena Akrami, a neuroscience professor at University College London, said two doctors suggested she was stressed, while a fellow neuroscientist told her to calm down and take antidepressants." As Yong comments, "Well before the pandemic, the health care profession had a long history of medical gaslighting – downplaying a patient's physical suffering as being all in their head, or caused by stress or anxiety."

When these kinds of long term problems occur – and which generally point to an ongoing chronic condition – medical practitioners often separate into different cliques, each promoting or defending their favorite explanation or theory. (Extensive name calling is common.) But those who continue to struggle with debilitating symptoms are the ones who suffer for it. As Clare Rayner, a consultant in occupational medicine in the UK, says, "There's pathology here that's not being investigated." Or as Timothy Nicholson, MD, puts it, "Lots of people feel that their symptoms are not believed." (This is because they are not.)

As I mentioned, these kinds of responses have been common in the Lyme community with which I've worked for over 15 years now. Many of them have long term post-Lyme disease symptoms, which are still routinely discounted. (The most common response from physicians is some form of "it is all in your head" and the prescribing of some form of psychotropic drug, usually an anti-anxiety medication.) Because so few physicians understand or are responsive to their struggles, both the Lyme and Covid-19 community have formed support groups (easily found via the internet and on Facebook). This kind of support can make the journey to health far easier than it would be otherwise. Both groups are focused on taking back control of their health care, the journey to health, and are exploring a great many interventions to reduce or eliminate the symptoms they experience. None of them are willing to accept that there is nothing that can be done.

The most common symptoms that accompany post-coronavirus syndrome are severe fatigue, headaches, trouble breathing, and a recurrent cough. But there are a great many more than that . . . over eighty symptoms have now been reported. Things are quite a bit more complicated than they appeared to be when the virus was first being treated. There are not just the dead, the sick, and the recovered. There are the (potentially) hundreds of thousands who are still struggling, some of whom may take years to recover, some of whom may never do so.

Post-Coronavirus Syndrome – The Symptoms

Many of the people with long term problems have tested negatively for antibodies. (Again, no one knows why . . . maybe they can't make them or maybe the antibodies fade quickly.) One of the main fears for many of them is reinfection which could make things much worse when added to the problems they still have. (The Covid-19 protocol outlined in this chapter can help prevent, or significantly reduce the intensity of, reinfection.)

The long term symptoms people experience are often cyclical in nature, they come and go, much like relapsing fever infections such as malaria. (With malaria, the infection recurs as new generations of malarial parasites are born, generally on a very specific schedule.) The recurrence can be mild or strong in intensity. And to make things worse, the recurrent symptom may not be the same each time. For some people, the body seems to cycle through a number of symptoms over and over again.

Fatigue is very common. For many it is severe and debilitating, so much so that a month in bed every so often is not uncommon. This is being likened to chronic fatigue syndrome (also known as myalgic encephalomyelitis or ME) though (of course) arguments are occurring over what *real* ME is and is not. (No, no, it is the tiny mark on the corner of the stamp that makes it a true 1942 Eagle, not the smudged ink at the top.) It reminds me of the Greek scholar who spent 40 years proving that *The Odyssey* wasn't written by Homer but another Greek of the same name. No matter the medical arguments, what people are experiencing is an

unremitting fatigue that is indeed chronic. They just want it to go away.

(Supporting mitochondrial health is essential in chronic fatigue-like conditions as they are the source of energy in all our cells. Also important is the use of adaptogenic herbs which will increase energy and help the body respond to long term chronic conditions and the stress they bring.)

Shortness of breath is another very common problem. It can be periodic or continual and ranges from feeling slightly out of breath to the breathlessness you feel after you have run a race. But it can also present as intense episodes of "air hunger" where the body just can't seem to get enough oxygen. It feels as if every cell in the body is starving for air simultaneously and is, not surprisingly, accompanied by extreme anxiety and panic.

You can find the rest of the extended symptom list in the chart that follows. This is taken from "An Analysis of the Prolonged COVID-19 Symptoms Survey by Patient-Led Research Team: https://patientresearchcovid19.com, and from a number of other sources such as news articles and personal communications. There may be others that I have missed. Treatment suggestions for the majority of these are included in the extended protocol section which follows the main protocols suggested for Covid-19 treatment.

BEGIN SIDEBAR

Symptoms that may occur during infection and which are also common for those suffering Post-Covid-19 Syndrome.

Respiratory System – Upper: Loss of smell, nasal congestion, sneezing, sore throat (severe or mild), sinus pain (severe or mild), post nasal drip, sinus infections.

Respiratory System – Lower: Persistent uncontrollable cough, dry cough, cough with mucus, extreme mucus production by lungs, coughing up blood (hemoptysis), shortness of breath (severe and mild), air hunger,

hypoxia, wheezing, rattling breath (aka, crackling or velcro sounds), lung burn (severe or mild), pneumonitis, pneumonia, cessation of breathing during sleep, tightness in chest (severe or mild), chest pain, fibrosis, emphysema, chronic obstructive pulmonary disease (COPD), idiopathic pulmonary fibrosis, bronchiectasis, recurrent lung infections.

Temperature Regulation Issues: Repeated shaking with chills, high continual or recurring fever, low continual or recurring fever, hot flashes, chills, sweats.

Ears: Earaches, tinnitus (severe and mild).

Eyes: Sensitivity to light, eye strain, blurry vision, floaters, pink (red) eye.

Liver: Elevated liver enzymes, fibrosis, cholangiopathy (bile duct damage), hepatitis.

Reproductive system: Low libido, possible damage to reproductive system, male and female.

Musculoskeletal: Fatigue (severe and mild), muscle pain (myalgia, severe or mild), joint pain (arthralgia, severe or mild), body aches (severe or mild), muscle spasms, body shaking, hand tremors, feeling of electricity zapping through body, tingling/numbness in extremeties, extreme muscle weakness.

Kidney/Urinary: Frequent urination, proteinuria, hematuria, elevated serum creatine, elevated urea nitrogen, extreme thirst, kidney injury (acute or mild), fibrosis.

Skin: Dry skin, rash, prominent veins, easy bruising, acne flareups, extreme skin sensitivity (to touch of any sort), tingling, red/purple lumps (itching or not).

Heart and Blood: Myocarditis (inflammation of heart muscle), blood clotting (often extensive), cardiomyopathy, generalized inflammation throughout system, fibrosis, palpitations, heart attack, low pulse rate, fast pulse rate, elevated heart rate (tachycardia), Postural orthostatic tachycardia syndrome (POTS, dizziness or fainting upon standing suddenly).

Gastrointestinal tract: Loss of taste, diarrhea (mild or severe), cramping (mild or severe), loss of appetite, nausea, vomiting, lower esophagus burning.

Neurological: Brain fog, trouble concentrating, short term memory loss, anxiety (severe and mild), panic attacks, depression (severe or mild), headache (severe or mild), malaise, vertigo, dizziness, lucid dreaming, mood swings, seizures, stuttering, various psychiatric disorders,
muscle weakness, nerve pain, depressed levels of consciousness, tingling/fizzing sensations throughout body, hair and scalp pain, confusion, a sense of not being one's self, encephalitis, long term mental impairment.

Miscellaneous: Hair loss, swollen lymph nodes, insomnia (severe or mild), low immune function.

END SIDEBAR

Herbal Interventions for treating and helping prevent infection by SARS-CoV-2

Here is the rationale underlying my suggested protocols:

My approach in the treatment of systemic inflammatory infections has always been to find plants that will counteract the actions of the organism involved – in this instance, SARS-CoV-2 – then to cross-correlate those with each other so as to find the plants that are active in the most categories that will inhibit the infection and its cytokine cascades, and which also have effectiveness for the symptoms the disease cases, and which have a long historical record of use for treating such conditions. To find these I extensively research hundreds, sometimes thousands, of scientific and research journals and articles. I then look at both historical and contemporary use which also involves researching a great many sources. The herbs chosen also have to be relatively easy to find.

> *NOTE: As I always say, the herbs I suggest here are not the only ones that can help during a Covid-19 infection; there are scores which will do so, many of which are listed in this material. However, that being said, I would strongly suggest that* Salvia miltiorrhiza *NOT be eliminated from the protocol under any circumstances (unless you absolutely cannot find a source for it). In my opinion, given its effects in counteracting so many of the actions and impacts the virus has, it is crucial to successful treatment of this pathogen.*

As you can tell from the list of herbs that affect various aspects of the virus, its infection, and inflammation strategy there are a number that are active in multiple areas, such as *Andrographis, Houtuyynia*, and *Polygonum cuspidatum*. These herbs can be blended in various ways to create your own protocols. Personally, I would always include *Isatis, Salvia miltiorrhiza, Scutellaria baicalensis,* and *Pueraria lobata.* I feel they are just too important in treating this infection.

Finding the Herbs:

Some herbal companies are making up these blends, you will just have to look around or ask. Because several (insert *strong* expletive) herb companies utilized my name (without authorization) and quoted some of my comments on treating coronaviruses with herbs to help increase their sales, the FDA and FTC began making house calls on them . . . to their dismay. So, despite a senior white house official touting unproven remedies (injecting or drinking bleach?) that are seriously dangerous, the government became quite upset with any herbal companies making claims – during the early pandemic hysteria it became a priority to shut them down. Thus the companies who are still making blends based on my protocol suggestions have become, let us say, shy. The blends are out there, you just might have to ask them if it is not listed on their websites.

IF you cannot find the protocols pre-blended, you can blend them yourself. Just buy the individual herbal tinctures and mix them together. (To clarify: if I say three parts of one, buy three ounces, if I say one part of another herb, buy one ounce, then blend them together in that ratio). You can generally find anything you need on the internet. Try amazon, google shopping, ebay, and etsy. Etsy is home to a good number of small herb companies which are selling herbal tinctures you will not find anywhere else. They are often far better (as well as cheaper) then those made by huge corporations. I highly suggest EarthAshram and Reverence Botanicals as a start. Montana farmacy has very high quality formulations and products as does Desert Tortoise Botanicals and Woodland Essence.

Note: I absolutely believe that avoiding the use of tinctures will NOT be beneficial with this infection. *I do not have an alternative protocol for those who wish to avoid alcohol intake.* Please be aware that the amount of alcohol in tinctures is minimal, much of the content is water.

Children's dosages: A child's dose can be found by dividing the child's weight by 150 or 160 (US pounds). Thus if your child weighs 40 pounds, give them one-fourth the adult dose; if they weigh 50 pounds,

give them one-third the adult dose.

And as always: If any adverse symptoms appear or if you feel something is off, *then stop taking the herbs*. Remember: You are the one who lives in your body, you are the best person to determine whether something is working for you or not and if it feels right to your body when you take it.

You are the only one who truly knows how health feels to you. Always pay attention to that and never settle for less *no matter what any particular health "expert" tells you.*

General Approach to Treatment:

Overall, in my opinion, the most effective herbal approach to SARS-CoV-2 addresses three different situations: 1) reducing the chance of infection; 2) treatment of active infections; 3) treating post-coronavirus syndrome. Here are my suggestions:

Reducing the Chance of Infection

Besides all the endlessly cited (and now tiresome) admonitions about hand washing, masks, and self-isolation (and repeated *ad nauseum* by too many medical practitioners of various sorts, including herbalists), actively supporting a strong immune system is the best place to begin. Secondly, I think the daily intake of a systemic anti-inflammatory such as mangiferin or Japanese knotweed root, an anti-coagulant and fibrinolytic agent such as lumbrokinase, and L-malic acid will help the system be prepared if an active infection does occur. Thus:

Pre-infection Immune Tincture Formulation: *Eleutherococcus senticosus* (2 parts), *Astragalus* (2 parts), *Cordyceps* (1 part), *Rhodiola* (1 part), *Glycyrrhiza* (1 part). Dosage: 1 tsp 3x daily.

Systemic anti-inflammatory: The best I know of is a formulation of *Mangifera indica* standardized to 60% mangiferin. Its anti-inflammatory actions are *very* specific for the kinds of inflammation seen in damaged

lungs and other organs. There are a great many very good studies on mangiferin and its actions in various organs for the treatment of systemic inflammation (see google scholar). The only good source in the United States at this time (that I know of) is Green Dragon Botanicals in Vermont. Dosage: 1-3 capsules 3x daily. Japanese knotweed root is also very good, especially since it stabilizes and protects endothelial structures: 1 tsp tincture 3x daily. (This herb is good for a great many problems that aging bodies experience since it is so high in resveratrol; no matter what is going on with you it is a good food grade herb to take daily.)

L-malic acid: 600 mg daily (*may* – not will – cause diarrhea).

Lumbrokinase: 1 capsule am and 1 capsule pm.

And yes, you can use nattokinase or serrapeptase. However . . . lumbrokinase is 30 times stronger than nattokinase and 300 times stronger than serrapeptase. Because the clotting during Covid-19 is so severe, I think lumbrokinase the best approach. Serrapeptase has other functions which make it useful during infection (despite it not being a very good fibrinolytic agent): it modulates temperature fluctuations in the body, relieves sinus pressure and inflammation especially during infection, degrades fibrin (but not very well), breaks down mucus in the lungs, helps break down circulating toxins and cellular debris, and is generally anti-inflammatory, and is especially good for helping relieve swelling and minor pains in the body. It is a very useful adjunct for lung conditions such as COPD. Nattokinase is best used for mild hypercoagulation problems and to break down fibrin (or scarring) in the body (including the lungs), lumbrokinase is best for severe hypercoagulation problems and, as well, breaking down fibrin (scarring) in the body. Both enhance circulatory health. (Note: some people think that earthworm-based forms of lumbrokinase are better than its synthetic, chemically produced forms. The best of these seems to be Canada RNA brand but it is very expensive; the dosage is half of the synthetic forms.)

Caution: Nattokinase and lumbrokinase should be used with caution if you are taking pharmaceutical "blood thinners."

To reiterate, for helping prevent infection:

1) Tincture formulation: *Eleutherococcus senticosus* (2 parts), *Astragalus* (2 parts), *Cordyceps* (1 part), *Rhodiola* (1 part), *Glycyrrhiza* (1 part). Dosage: 1 tsp 3x daily.

2) *Mangifera indica*, standardized to 60% mangiferin, 1-3 200 mg capsules 3x daily.

3) L-malic acid, 600 daily.

4) Lumbrokinase, 1 capsule (600,000 IU, aka 40mg), in am and pm.

Treatment of Active Covid-19 Infection:

What is needed are plants that have the following actions:

1) Plants specifically antiviral for SARS-CoV group of viruses (the strongest found so far are *Scutellaria baicalensis* (root – a potent systemic antiviral herb), *Isatis spp* (root and leaf), *Houttuynia spp* (leaf), *Lycoris radiata* (extremely potent but not easy to find), and the essential oil of Bay Laurel (*Laurus nobilis*) – very strong as well. These are followed by *Glycyrrhiza spp* (root), *Forsythia suspensa* (the fruit), and *Sophora flavescens*. *Lonicera japonica* and *Polygonum cuspidatum* are effective as antivirals for coronaviruses as a whole but have not, to my knowledge, been tested against the SARS group.

2) ACE2 interventions which include: **a)** Protect ACE2 by blocking viral attachment. Specific for this are *Glycyrrhiza spp, Scutellaria baicalensis, Sambucus spp, Aesculus hippocastanum, Polygonum cuspidatum, Rheum officinale*, plants high in procyanidins and lectins (e.g. *Cinnamomum*) and luteolin. **b)** Upregulate and protect ACE-2 expression, increase its activity (esp in the aged), and lower Ang-2. Herbs specific for this are *Pueria lobata, Salvia miltiorrhiza, Ginkgo biloba*. **c)** Use of ACE inhibitors (in contrast to ACE-2 upregulators) to increase the presence of ACE-2 and help protect the lungs from injury: *Crataegus spp* and *Pueraria lobata* are specific. **Remember:** These are not drugs, they are *modulators* and they do many other things besides this.

3) Modulate cytokine responses in general (*Salvia miltorrhiza* – a cytokine adaptogen) and in specific: plants that can inhibit TNF-a, which include *Andrographis paniculata, Cordyceps spp, Eupatorium perfoliatum, Glycyrrhiza spp, Houtuyynia cordata, Pueraria lobata, Sambucus spp, Scutellaria baicalensis, Salvia miltiorrhiza,* and melatonin, not a plant but useful in this infection for a variety of reasons; IL-1β inhibitors include *Cordyceps spp, Eupatorium perfoliatum, Polygonum cuspidatum, Pueraria lobata, Salvia miltiorrhiza, Scutellaria baicalensis.* IL-6 inhibitors include *Andrographis paniculata, Isatis spp, Pueraria lobata, Salvia miltiorrhiza, Scutellaria baicalensis,* and melatonin. IL-8 inhibitors include *Cordyceps spp, Isatis spp, Polygonum cuspidatum*.

4) Protect endothelial cells (*Polygonum cuspidatum, Salvia miltiorrhiza, Scutellaria baicalensis*).

5) Protect spleen, lymph nodes, and strengthen lymph system *(Galium spp, Scutellaria baicalensis, Salvia miltiorrhiza, Bidens pilosa*).

6) Protect lungs, heart, kidneys, brain from damage. *Note:* the herbs already suggested will accomplish this for most of the organs without adding anything else. There will be additional suggestions in the extended protocol.

However: a note on the kidneys: during active infection, to protect the kidneys, regular consumption of a strong nettle (*Urtica dioica*) infusion along with a tincture of nettle seed is highly recommended. (Note: for years I was curmudgeonly in response to (i.e., highly suspicious of) occasional claims I heard about nettles being able to heal kidney damage. However, my partner Julie McIntyre has been suggesting it in practice for some time and has reported significant healing of damaged kidneys, in one instance so much so that dialysis was avoided. I rather shame-facedly stand corrected.)

To make: Add 1-2 ounces of dried nettle leaf to a quart mason jar. Add hot water, let steep overnight, strain and drink throughout the next day. (Some people think the already infused herb can be used again at least

one more time.) Do this every day. As well, take 1/4 tsp nettle seed tincture 3x daily, every day.

And, as well, a note on the heart: Since heart damage is being found in a large number of those infected by the virus (in those with and without symptoms, in the young as well as the old), plants specific for minimizing or preventing that damage is essential. During active infection: *Crataegus oxyacantha* (hawthorn), dosage 1800 mg 2x daily plus *Astragalus*, 1000 mg 3x daily is, I think essential.

During active infection, continual use of standardized *Mangifera indica* at a higher dose, a higher dose of lumbrokinase (or nattokinase), and L-malic acid are all indicated to help protect the organs.

The use of an both a nebulizer and a steam inhalant is strongly suggested for infection in the lungs as well as the use of plants that can stimulate lymph drainage from that organ. Details follow.

Active Infection Protocol

This is to be taken at the first signs of infection. It is composed of three tincture formulations and some suggested supplements. **Note:** This should be continued for two weeks *after* the cessation of symptoms otherwise the symptoms may recur. Please note: there are a few suggestions for treating infection in specific organs as well. These follow the initial formulations.

1) Antiviral formulation: *Scutellaria baicalensis* (3 parts), *Isatis spp* (2 parts), *Pueraria lobata* (2 parts), *Glycyrrhiza spp* (1 part). Dosage: 1 tsp 3x day at onset, if infection becomes acute (i.e., more intense) 1 tsp 6x day. The more serious the infection, the higher the dose. (Note: *Houttuynia* [2 parts], which is a very good antiviral for this organism can also be added to the blend if desired or substituted for *Isatis*.)

2) Immune formulation: *Cordyceps* (3 parts), *Eleutherococcus senticosis* (2 parts), *Rhodiola* (1 part), *Astragalus* (1 part). Dosage: Same as number one.

3) Cellular protection/cytokine modulation/spleen-lymph support: *Salvia miltiorrhiza* (3 parts), *Gallium*

spp (2 parts), *Bidens pilosa* (1 part). Dosage: Same as number one.

4) *Urtica dioica* (i.e. nettle) infusion daily (make as discussed previously) plus 1/4 tsp of nettle seed tincture 3x daily. (This is good for you for many reasons but with this infection it will help your kidneys stay healthier than they would without it. It may, under some circumstances, help prevent or allow recovery from dialysis, especially in the very early stages of kidney damage.)

5) *Crataegus oxyacantha* (hawthorn), dosage 1800 mg 2x daily.

6) Standardized *Mangifera indica* capsules: 3-5 200 mg capsules 3x daily (Green Dragon Botanicals brand).

7) Lumbrokinase (or nattokinase): 1-2 capsules 2-3x daily (and please use an oximeter to check blood oxygen levels daily)

8) L-malic acid: one 600mg capsule 3x daily.

9) Probiotic: one capsule daily

During Active Lung Infection:

Besides the general protocol, I suggest three things to treat Covid-19 infected lungs: 1) Bay laurel (*Laurus nobilis*) essential oil as a steam inhalant. 2) The use of a nebulizer as outlined below. 3) Mucinex tablet (or its equivalent), 2x daily.

A. Bay laurel essential oil. This essential oil is potently antiviral for SARS viruses, it can be used as an adjunct to kill the organism in the lungs.

Note: This is a *very strong* essential oil. You *can* add it to the nebulizer, as outlined below, **but** I have found it far too strong for that. To weaken it I sucked some up in a glass dropper, then squirted it back into the

essential oil bottle, then I merely sucked up some of the nebulizer liquid itself and squirted the whole thing back in the nebulizer. This picked up enough of the essential oil still on the sides of the glass dropper to make it just about tolerable. Nevertheless, it is ferociously strong. (It can also be dabbed or misted on masks or gloves to kill any virus that lands on their surfaces.)

Bay laurel essential oil as inhalant steam: 1-2 drops in a pot of boiling water on the stove. Turn stove off (please don't set the towel on fire), remove from stove top, cover head and pot with towel, and breathe in for awhile. (More than 2 drops will probably be too strong.) People have reported good success with Bay Laurel EO in reducing the impact of the infection on the lungs – some have said it eliminated the infection entirely. (And no, they probably won't let you do this in the hospital or a nursing home for either yourself or your loved ones.)

B. Nebulizer:

1) The use of a nebulizer will help a lot. These are available inexpensively through Amazon.com or other online outlets. All of them seem to work fine, I use a Leader brand, not sure it is the best but it works okay for me. *The nebulizer cups that come with these machines are often not very good. You will need to get a different one.*

2. The best nebulizer cup to use. Respironics is the brand I suggest. You can get them on the internet but not from the company that makes them without a prescription – which I find rather idiotic. They make two kinds (also idiotic). One is very cheap and is listed as disposable (don't get), the other is noted as re-usable. **Get the re-usable one.** Just wash it out after use with very hot water and liquid dish soap. The reusable one will stand up to essential oils if washed well after use. Mine lasts months before I can find any evidence of degradation of the plastic. The disposable ones will begin to degrade from the essential oils within a few days and you will start inhaling microparticles of plastic. Very much ***not*** a good idea.

3. You will also need: Saline solution for nebulizers. I use modudose saline solution for inhalation sold by Amazon, 5 ml each, 100 to a box, $16.50. One 5 ml container per session.

4. Also needed: Effervescent glutathione capsules. Glutathione is a potent antioxident, normally present in the surfactant liquid in the lungs. People with severe lung infections and chronic conditions tend to have low levels of all antioxidants including glutathione in their lungs. Using this will help reduce the inflammation in the lungs. I dissolve a single capsule in the 5 ml saline solution I have already put in the nebulizer cup. (It will fizz and foam when you first put it in the liquid . . . after you have finally gotten the capsule apart that is.) I think Thernaturals, Reduced L-glutathione plus, enhanced absorption, ultra purity grade is the best one to use. It costs $37.00 for 100 capsules. This will last a bit over three months.

4. Essential oils. These are pretty important. I put these in the nebulizer cup in single drop doses the very last thing. I suggest the use of 1-2 drops of peppermint and 1-2 drops of eucalyptus. The peppermint is strongly anti-spasmodic (helping coughing); both of the essential oils will help thin and liquify mucus and help it move up and out of the lungs, thus enhancing breathing and oxygen exchange. (***Note****:* IF you develop a lung infection (e.g., flu) , the use of a drop of oregano essential oil can help reduce or stop its development . . . though not always. Nevertheless it is a good thing to try at early onset. Other suggestions are in the extended protocol section which follows.)

C. **Mucinex tablet** (which is a 600 mg guaifenesin, extended release tablet). This will, along with the rest of the nebulizer protocol, thin and help move mucus up and out of the lungs. Dosage: one tablet am, one tablet pm. (There are also non-extended release forms by other companies, they all work fine.)

To Protect the Kidneys

Again, nettle infusion daily along with nettle seed tincture.

To Protect the Heart

Researchers are finding that heart damage (especially, myocarditis) is a regular occurrence in people infected by this virus. For some people it will not resolve after infection. It is often not apparent until the person is under physical stress. Many of the people who have prolonged heart damage did not show any symptoms of Covid-19 infection at all; most of them are young, not old. Given this, it is essential that heart protective herbs be taken if the virus is endemic in your area or if people around you are being infected or as soon as you yourself become infected. Add to protocol:

1) *Crataegus oxyacantha* (hawthorn), dosage, 900 mg 2x daily; if infected 1800 mg 2x daily.

2) *Astragalus*, 1000 mg 3x daily.

GI Tract Exacerbations

To help with the symptoms of GI tract infection, e.g., the cramping and diarrhea. I have found the following to be very helpful.

For cramping: *Viburnum prunifolium* and other related species, aka cramp bark. Dosage: 30 to 90 drops to 6x daily. This can take anywhere from a few minutes to a few days to kick in but it does help when it does. *And/or:* peppermint – either capsules that include the essential oil *or* those really tiny coffee mints that are incredibly strong . . .just swallow 3-4 of them as needed.

For diarrhea: *Rubus villosus* (aka: blackberry) root. Strong decoction: put one to two ounces of the root in two quarts of water. Bring to boil, simmer until liquid is reduced to half. Cool and then consume during the day. Repeat every day until diarrhea is under control. *Note:* This should also help control any bleeding that is

occurring. ***Please*** do not buy blackberry root tea bags, they are useless. Do not try to substitute raspberry root either, it is not nearly as good and you will probably end up with the leaves anyway, which are not nearly as strong. You can always find blackberry root on etsy via the internet (for some reason very few herbal companies carry this herb).

Also: *Ailanthus altissima* (tree of heaven), another powerful (and underutilized) herb which is very good for a number of problems that occur during Covid-19 infections, including diarrhea. It is the inner bark which is used (that is, the white bark that peels off easily which is located just under the very thin green outer bark). This is an invasive botanical throughout the US and much of the EU and thus pretty easy to find. *Other actions of the herb:* bronchial dilator, anti-inflammatory (esp for the lungs), antifibrotic (esp in the lungs), anti-asthmatic, strong antioxident, antiviral, antimicrobial, antimycotic, antimalarial.

Note: Tincture of goldenseal or any of the other berberine-containing plants may be of use; they can sometimes initiate strong healing of the GI tract.

Extended Symptom-Specific Protocol for Treatment of Covid-19 and Post Coronavirus Syndrome

1.0 Fatigue

A. Acute: *Eleutherococcus* tincture, use 1:1 or 2:1 formulations. (Made by HerbPharm and some others.) Stop every ten days for a few days, then begin again. When the fatigue becomes less severe, convert to the 1:5 formulation.

B. Chronic:

1) *Eleutherococcus* tincture, 1:5 formulation as a tonic, ½ - 1 tsp 3-6x day.

2) Chronic fatigue formula, see section **1.1**: 1/4 cup of the powder, blended in juice or water in morning and again just before bed.

3) D-ribose, capsules to 3400mg morning and noonish or 1 scoop of powder in liquid am and noonish.

C. For adrenal fatigue, add:

1) *Pinus* (Pine pollen) tincture, 1/4-1/2 tsp 3x daily (must be held in mouth for one minute then swallowed, do not put in water), and/or . . .

2) *Glycyrrhiza* (licorice) tincture, 1/4 to ½ tsp 3x daily (not to exceed 30 days), and/or . . .

3) Maca (*Lepidium meyenii*) powder, 1 tsp 2-3x day, and/or . . .

4) *Rhodiola* tincture, 10-40 drops 2-4x day, and/or . . .

5) *Codonopsis pilosula* tincture, 1/4 tsp 4x day.

D. For thyroid fatigue, add:

1) *Juglans nigra* (black walnut hull) tincture, 5-10 drops 2x day, and/or . . .

2) Selenium, 200 mcg daily, and/or . . .

3) Kelp, 500 mg every other day, and/or . . .

4) *Rhodiola* tincture, 10-40 drops 2-4x day.

E. For mitochondrial fatigue

1) *Leonurus cardiaca* (motherwort) fresh plant tincture, 1/2-1 tsp 3x day, and/or

2) Nicotinamide riboside (an NADH precursor), 900 mg daily during acute fatigue, 300 mg daily for mild, and/or . . .

2) NADH (nicotinamide adenine dinucleotide hydride, or NAD+), 10-20 mg 2x day, and/or . . .

3) D-ribose, capsules to 3400 mg morning and noonish or 1 scoop of powder am and noonish, and/or . . .

4) L-arginine, 1000 mg 3x day, and/or . . .

5) Also of use: L-carnitine (500 mg 3x day), Alpha lipoic acid(200-600 mg daily), Coenzyme Q10 (60-150mg daily).

1.1 Chronic Fatigue Formula

This is *very* specific for reversing fatigue, especially if it is chronic. *Note:* all the herbs *must* be *powdered*. (To find herbs: Amazon, google shopping, ebay, etsy. To find it preblended: google search)

To make:

1) Take two parts (for example, 4 ounces) *each* of: spirulina, milk thistle seed, licorice, astragalus, turmeric, dandelion root, and nettle leaf, and . . .

2) One part each (for example, 2 ounces) *each* of : chlorella, burdock root, ashwagandha, eleutherococcus, bladderwrack, and dried wheat grass juice powder.

3) Blend them well in a *very* large bowl.

Dosage:

1) During very severe, acute fatigue (e.g. mono) I normally suggest 1/4 cup of the powder, blended in a blender in water or juice in the morning and evening just before bed. For ongoing, continual fatigue (where you are not bedridden) I suggest only taking it before bed. (Some people report being kept awake on this, if so take before dinner; it doesn't bother me.) The dose can be adjusted up or down as necessary. Note: These are food grade herbs, just like broccoli . . . well, okay broccoli is not actually edible . . . like red chard then.

2.0 Respiratory System

2.1 Upper:

A. Sinus problems

1) Sinusitis, ongoing:

a) Cold Snap (as directed on bottle).

b) Black seed oil (*Nigella sativa*), 1000 mg, two capsules, 1-3x daily.

2) Sinus pain: Serrapeptase, 2 capsules, 2-3x daily.

3) Congestion:

a) Myrtol, as directed on label

b) *Monarda spp* (bee balm) tincture, 20-30 drops as needed.

4) Burning:

a) Homeopathic cantharis 30C, as directed on label.

b) Homeopathic gelsemium 30C, as directed on label.

5) Sneezing (with drippiness): Homeopathic sulfur, 30C, as directed on bottle.

6) Post Nasal Drip:

a) Myrtol, as directed on label

b) Homeopathic sulfur, 30C as directed on label.

B. Sore throat:

1) *Echinacea angustifolia* tincture (do not use *E. purpurea*). Dosage: half dropper or so of tincture in mouth, hold till saliva stimulated, let dribble slowly down back of throat. Repeat as needed.

C. Loss of smell: I have not yet been able to figure out anything for this, I am sorry. I will keep working on it.

2.2 Lower

A. General:

1) Continue with nebulizer protocol, this will help clear mucus and help breathing and oxygen intake.

B. Persistent, uncontrollable cough: This is one of the more common problems during lung infections and, sometimes, post infection. It is *very* different than the kind of cough most people have during lung infections. It is in fact debilitating. Given the ubiquitous nature of severe cough you could be forgiven in thinking that researchers have spent a lot of time on it. You would be wrong. Although some two billion dollars are spent yearly on cough relief medicines in the United States most are only good for mild coughs, with mucus or without. None are useful for severe, intense, uncontrollable coughing. Oddly enough, no one has really spent the time to figure out the depth physiological processes involved in coughing (of any sort). In consequence little is known about why it happens or about what can be done to stop it. I know a few things that might be of benefit but only two that are always reliable to stop intense, persistent, uncontrollable cough. They are increased oxygen through the use of an oxygen generator/concentrator and opiates of one sort or another.

1) Oxygen concentrator/generators: These usually require a physician prescription which can be problematical because . . . normally, to prescribe, a physician wants to see blood O2 content lower than 88. However, a prescription is not always necessary – if you simply buy a used machine. You can buy used stationary (as opposed to portable) machines through ebay for about half the retail price. You can also buy new ones from retail outlets that specialize in selling rather than renting the units. Many of them are agreeable to selling direct to the consumer. (These are *not* the local oxygen supply stores in your local town that work in concert with hospitals – which will not sell or rent you machines without a prescription; they are usually internet based and independent.)

No one knows why (and I cannot find any data on it) but the intake of O2 will generally stop severe, uncontrollable cough within a minute or two and will continue to do so as long as you are using the machine. It

is one of the few things that can give relief. If you have been coughing intensely for 4-6 hours a day for months just having the relief is often enough to substantially increase your quality of life. Most of the standing machines have settings that go to 5 (a few go to 10). Use setting 2, at most 3.

2) Opiates. Due to the current Puritanistic panic over opiates in the United States, prescriptions for them are now hard to obtain – in some states the hurdles are draconian. It is very misguided and has little to do with medical necessity and everything to do with misplaced panic over DRUGS. (A lot of people are needlessly suffering because of it.) A huge fuss has been made about the addictive nature of opiates but in fact there are different kinds of opiates, each with a different level of addiction and attendant withdrawal problems. (Ecologically speaking, opiates are some of the safest drugs in the world, antibiotics are the worst. One is heavily controlled, the other given out like candy.)

For most of my life (born 1952) codeine cough syrups were easily obtainable (but they are not now). They do work very well to control severe, intractable coughing. The addiction and withdrawal problems from codeine cough syrups are relatively minor for nearly every person who uses them. Nevertheless, they are now only available only by prescription and physicians are generally loathe to prescribe them. (In contrast, benzodiazepines – examples are xanax and valium – are often highly addictive, sometimes after a single dose. Withdrawal symptoms are often incredibly difficult; if the drug is stopped suddenly can sometimes result in death. Going off the drug can take over a year because a careful, monitored reduction in dosage is necessary. By this standard opiates are very safe medications while benzodiazepines are not. Yet benzodiazepines are some of the most widely, and commonly, prescribed medications in the United States, and yes, they do give them out like candy. They are often prescribed for people with chronic conditions whom the physician thinks is suffering from “anxiety.”)

The second most beneficent opiate for unremittant, severe cough is tramadol. It possesses a number of

other useful attributes as well, especially in difficult chronic conditions with pain or severe cough. It increases levels of serotonin and noradrenaline in the brain, and is specific for lowering depression, anxiety, hypervigilance, muscle stress, and insomnia. Neither codeine cough syrups nor tramadol are considered to be dangerous the way that heroin or oxycontin are. (Withdrawal from tramadol is unpleasant, lasts 7-14 days, and is nothing like the intense withdrawal that occurs from heroin. Although the physiological impacts are different, it is about like stopping smoking, you will feel like hell but it is not impossible by any means.) Tramadol is very easy to get in Mexico and to some extent in Canada. It is also much cheaper in both those countries. Tramadol will stop coughing within an hour or so and lasts for 8-12 twelve hours. Some people prefer the use of 50mg twice daily; I have found that the 100mg capsule preferable, but this is simply a matter of individual taste and response.

3) Herbs that stimulate the vomiting reflex are sometimes specific for severe uncontrollable cough. (The point is to *stimulate* the reflex, not activate it.) Ipecac, once a staple in every medicine cabinet in the U.S., is a case in point but is now, thanks to the FDA, impossible to get. However . . .

a) *Sambucus spp* (any), fresh (that is *non-decocted*) leaf tincture, to 30 drops as needed. *Note:* Decocted tinctures (which deactivate the compounds that cause nausea and/or vomiting) are available but for this use non-decocted is more effective (if it is going to work for you at all). Extended use may cause watery diarrhea.

b) *Lobelia inflata*, fresh or dried leaf tinture, 5-20 drops as needed. Or: dried seed tincture, 3-10 drops as needed. *Note:* The dried leaf is far more nausea inducing than the fresh leaf or seed and may be more useful for stopping severe coughing. For some people the plant is also a strong emetic, I, however, have not found it so. *Note:* This tincture can also help move mucus up and out of the lungs, see section D below.

4) *Echinacea angustifolia* root tincture can anesthesize the back of the throat and to some extent

the bronchi if a half dropper of tincture is taken, held in the mouth until saliva is stimulated and then is slowly dribbled down the back of the throat. Repeat as needed.

5) Western skunk cabbage (*Lysichiton americanum*) can sometimes help, see section D below.

6) For herbs and herbal combinations that might be useful, please see the next listing: cough, general.

C. Cough, general:

1) Nebulizer with peppermint essential oil (EO) can help, sometimes significantly. Peppermint EO is specific for spasming. It works just as well in the lungs as the GI tract.

2) *Desmodium spp*, leaf tincture, 1:5 50% alcohol, 1 tsp to 6x daily (may also be used in cough syrups), an excellent underused herb.

3) *Aster tataricus,* root tincture, 1:5, 50% alcohol, ½ - 1 tsp to 6x daily, another excellent underused herb.

4) *Pelargonium sidoides* (umckaloabo) tincture, 1:5 50% alcohol, 30 drops to 6x daily.

5) Myrtol (aka Gelo-myrtol-forte), dosage as on label.

6) *Hedera helix* (English ivy), as tea, often combined with . . .

7) *Thymus vulgaris*, as tea with or without ivy, or combined in cough syrup.

D. Mucus, excessive, in lungs (with cough or not): Mucus build up is often a problem during lung infections and in damaged lungs. The build up of mucus in the lungs is bad for a number of reasons: it inhibits depth of breathing thus lowering blood O2, is a fertile ground for pathogenic organisms, and by itself stimulates the cough reflex . . . which will not stop until you get it out. If you are suffering post-covid-19 syndrome and you have persistent mucus buildup in your lungs you will need to develop a daily regimen to get the mucus out. There are a number of things that can help. Use as many of them daily as you can.

1) *Lysichiton americanum* (western skunk cabbage), ***freshly*** dried root tincture only (the well-dried root is far less effective). Dosage: as desired or needed – normally, what I use for myself is around 30 drops whenever I want or feel like I need some. This herb has a great deal of usefulness in chronic lung conditions; it increases O2 levels in the blood, lowers cough levels (even when intense), *and*, importantly, liquifies then stimulates expectoration of mucus from the lungs, copiously. ***Note:*** I have not used the eastern variety and I am not sure it will do the same thing (though I have been told it will.) The western variety is a bit hard to find.

2) Guaifenesin tablets, 600 mg daily. Mucinex is a good one but others work well. This will thin and help stimulate the expectoration of mucus from the lungs. It is a compound isolated from plants, the *Guaiacum* genus. It is only minimally a cough suppressant and only then because there is less mucus in the lungs.

3) Nebulizer daily with essential oils of peppermint and eucalyptus.

4) Ginger juice tea. (1-2 ounces fresh juiced ginger, 6-8 ounces hot water, pinch of cayenne, squeeze of fresh lyme, honey to taste). 3-6x daily. Extremely good for thinning mucus.

5) Other mucus thinning herbs of note: *Desmodium spp, Aster tataricus*, fennel, fenugreek, yerba santa (*Eriodictyon*), thyme, English ivy, coltsfoot, cayenne, osha, *Pelargonium sidoides*, myrtol, and so on.

6) Flutter device. Smiths acapella is a decent one. This will help break up mucus in the lungs and stimulate expectoration. Many people use them. They work better if you are also using herbs that thin the mucus.

7) Inversion table. If you have an inversion table, lying on one daily will help the mucus flow upward, stimulate cough, and help it move out of the system, especially if you are taking herbs that thin the mucus. (I didn't find it particularly helpful but many people do.)

E. Hemoptysis (coughing up blood):

1) Yin Qiao San (TCM formulation, amazon.com or google shopping, take as directed on bottle).

2) Ke Xue Fang (TCM formulation, by practitioner only, try Green Dragon Botanicals in VT, take as directed.)

3) Sophora support (Huai Jiao Wan), google shopping, as directed on bottle.

4) *Desmodium spp*, leaf tincture, 1:5 50% alcohol, 1 tsp to 6x daily, an excellent underused herb.

5) *Cinnamonum* (cinnamon), 20-50 drops tincture (60% alcohol, 5% glycerin) 4x daily.

6) Combination tincture: *Polygonum cuspidatum, Echinacea angustifolia, Salvia miltiorrhiza,* equal parts of tincture of each. ½ to one tsp to 6x daily.

F. Shortness of breath (dyspnea):

Comment: A common problem among both the Lyme community and post-coronavirus sufferers is what is often referred to as "air hunger." As with a number of symptoms (e.g. "herxing") there is a lot of vagueness about what this actually is. ("Herxing" is in actuality far different than a return of symptoms, it has a very specific set of physiological symptoms and always includes, at onset, a precipitous drop in body temperature which creates ***severe***, uncontrollable chills). "Air hunger" suffers from a similar definitional unclarity; it's rarely described well. (Nor have I seen a physiological explanation for "air hunger.")

Shortness of breath (aka dyspnea), which is also a common problem in those who have experienced serious lung damage (I know this one personally), is simply difficulty in "catching one's breath". This occurs due to damage (of various sorts) in the alveoli of the lungs. For many people this means that there has been inflammation in the thin cell layer between the alveoli and the blood vessels. Scarring occurs, and gas exchange becomes inefficient. During exertion, the muscles demand more oxygen but the lungs are unable to increase the rate of O2/CO2 exchange and so a terrible shortness of breath occurs. (This can be alleviated to some extent

through the use of antifibrotic herbs and the protocols in this chapter.)

Air hunger, on the other hand tends to be rather rare in terms of how often one experiences it (at least in my experience) while shortness of breath, whether severe or mild, is not. The air hunger that I have experienced (and that I have heard described by others) is generally a sudden onset inability to get enough oxygen into the body, as if every cell is gasping for breath at the same time. It feels as if every part of me is suffocating *in that moment*. I stop and lean against the wall, my mind disconnects and my body takes over completely, trying to get breath. Physiological survival responses take over. It is terribly frightening. Thankfully, for most people, it usually of short duration, a few minutes at most.

Because of the sudden onset, its shortness of duration, and its relative rareness (in terms of how often it occurs), the main thing that people tend to utilize are pharmaceutical inhalers, which may or may not be useful. I have not yet found any tincture (which is what would be needed) that can be carried which, when used, will immediately interrupt the process that is happening. However, the protocols that are suggested do, over time, and often relatively quickly, reduce the incidence of air hunger. The three suggested interventions for severe (or acute) dyspnea may also be of use, especially if used over time, to reduce or eliminate air hunger episodes. (I would suggest carrying *Ailanthus altissima* tincture with you (or a 1:5 ailanthus/osha combination) and trying a few drops or so at any air hunger attack.)

1) severe:

a) Liquid chlorophyll (Chloroxygen brand is often used), 1 tbl in 20 oz water, drink throughout day, and/or . .

b) *Ailanthus altissima* tincture, 10 drops to ½ tsp 4x day, and/or. . .

c) 1) *Lysichiton americanum* (western skunk cabbage), **freshly** dried root tincture. Dosage: 30 drops as needed or desired.

2) mild, same as above plus:

a) *Cordyceps* tincture, 1 tsp 3x day, and/or . . .

b) *Polygonum cuspidatum* (knotweed root) tincture, ½ tsp 3-6x daily, and/or . . .

c) *Astragalus*, 1,000 to 4,000 mg, 3-4x daily.

G. Hypoxia:

1) *Lysichiton americanum* (western skunk cabbage), **freshly** dried root tincture. Dosage: 30 drops as needed or desired.

2) Rhodiola, 10-40 drops 2-4x daily.

H. Wheezing:

1) *Ammi visnaga* (khella) tincture (1:5 60% alcohol), 60-120 drops to 4x daily. Capsules are also helpful.

2) Datura leaf (fresh) tincture, 5-10 drops as needed.

3) *Lysichiton americanum* (western skunk cabbage), **freshly** dried root tincture. Dosage: 30 drops as needed or desired.

I. Rattling breath (i.e., cracking or velcro sounds): This is common in chronic lung conditions. It is caused by mucus building up in the bronchioles in the lungs. When you breathe in or out, the air has to move through the mucus which makes the sound. Clearing the mucus will help. See 2.2, section D.

J. Lung burn

1) Xie bai san (TCM formulation, generally practitioner prescribed, try Green Dragon Botanicals in VT, use as directed).

2) Ma Xing Gan Shi Tang (same as above).

3) Combination tincture blend of the tinctures of goji berry (*Lycium chinense*), white mulberry

(*Morus alba*), white peony root (*Paeonia Lactiflora*), licorice (*Glycyrrhiza spp*). One part each of the first three, one-half part of licorice (i.e., one ounce each of the first three, one-half ounce of the last, blended together). 1 tsp of tincture in liquid of your choice 3-6x daily depending on intensity of symptom. (*Note:* the best place to find the first three herbs in tincture form is Etsy and perhaps Amazon.com. I absolutely do not recommend Hawaii Pharm as a brand to use.)

K. Chest pain (including tightness in chest):

1) Pea protein 1-2x daily (dosage as directed on container).

2) Kava (*Piper Methysticum*), 10:1 instant powder, in 6-8 ounces hot water, honey, cream (to taste). 1-3 cups daily as needed.

3) Combination tincture, equal parts, of motherwort (*Leonurus cardiaca*) and *Pedicularis bracteosa* (i.e., lousewort, which I prefer, for taste reasons, over *Pedicularis groenlandica,* i.e., elephant head. Either works fine. *Dosage:* one to two tablespoons as needed, in liquid.

4) *Pulsatilla patens* (pasque flower), fresh flower tincture, 5-10 drops as needed.

L. Pleurisy (inflammation of the pleural sac):

1) *Asclepias tuberosa* (pleurisy root) tincture, 30-90 drops 3x daily. (Note: all Asclepias species are useful for this.)

2) *Mangifera indica*, standardized to 60% mangiferin, 1-3 200 mg capsules 3x daily.

M. Chronic Bronchitis:

1) TCM formulation: Si Ni Tang (prepared aconite, ginger, licorice), 4 capsules 3x daily. *Note:* Best if used with ephedra (and yes, I still sometimes order it from China irrespective of what the FDA thinks I should do; it's a good herb but meth heads ruined it for the rest of us.)

2) *Desmodium spp*, leaf tincture, 1:5 50% alcohol, 1 tsp to 6x daily, an excellent underused herb.

3) *Aster tataricus,* root tincture, 1:5, 50% alcohol, ½ - 1 tsp to 6x daily, another excellent underused herb.

4) *Pelargonium sidoides* (umckaloabo) tincture, 1:5 50% alcohol, 30 drops to 6x daily.

N. Recurrent lung infections:

1) Lomatium blend, tincture combination, 2 parts *Lomatium*, 2 parts *Echinacea angustifolia*, 2 parts *Glycyrrhiza* (licorice), 2 parts *Ceanothus* (red root), 2 parts *Bursera microphylla* (elephant tree), 1 part decocted *Sambucus spp* (elder) leaf or bark, 1 part *Asclepias asperula* (inmortal, pleurisy root will do but is not as good), 1 part *Ligusticum porterii* (osha), 1 part *Inula* (elecampane), 1 part *Isatis* (root or leaf or combination of the two), 1 part *Eriodictyon* (yerba santa). Dosage: 30-60 drops each hour until infection resolves. The use of gan mao ling at the same time is suggested (since lung infection in those with compromised lungs is a serious issue. Such infections need to be reduced as rapidly as possible).

2) Gan mao ling, 5-6 tablets 6x daily during active infection.

O. Fibrosis (scarring) of the lung:

1) To inhibit, reduce, or repair:

a) Tincture formulation, equal parts: *Angelica sinensis, Salvia miltiorrhiza, Lonicera japonica, Polygonum cuspidatum, Cordyceps spp.* Dosage: 1tsp 3-6x daily depending on severity of fibrosis, and . . .

b) Lumbrokinase or nattokinase, 1-2 capsules, 2-3x daily. (NOTE: if you are already taking anti-coagulants, caution is warranted in adding either of these.)

3.0 Neurological/Brain Problems

A. Specific:

1) *Uncaria rhynchophylla* tincture: ½ to 1 teaspoon 3-6x daily, depending on severity of brain infection.

2) Tryptophan, 1500 mg 3x daily. (*Note:* will lower brain inflammation and decrease a number of psychological/physiological symptoms.)

B. With severe brain/CNS involvement, add:

1) *Scutellaria baicalensis*, tincture, can increase current dose, plus . . .

2) *Chelidonium majus* (greater celandine), tincture, 1/4 tsp 3x daily, plus . . .

3) *Pueria lobata* (kudzu) root, tincture, 1/4 teaspoon 3-4x daily.

4) N-Acetyl Cysteine may also help, 2000, 2x daily, as will . . .

5. *Leonurus cardiaca* (motherwort) fresh plant tincture, 1/4 to ½ teaspoon to 6x daily.

C. To reduce neurotoxins in the brain (e.g. quinolinic acid), add:

1. *Sida cordifolia* tincture: 5-40 drops to 3x day, and/or . . .

2. *Angelica sinensis* tincture: 1/4-1/2 tsp 3x day, and/or . . .

3. Melatonin, 3-9 milligrams daily.

D. Brain "feels toxic," add:

1) *Centella asiatica*, 500 mg 2x daily or 1/4 tsp tincture 2x day. *Note:* may cause headaches.

E. Low brain energy, add:

1) Acetyl-L-carnatine, 500 mg 2x daily (*Note:* contraindicated if seizures are present.)

F. Brain "pressure," add:

1) *Pueria lobata* (kudzu), 1/4-1/2 tsp of tincture 3x day.

G. Hand or body tremors, add:

1. *Sida acuta* (or equivalent species), 5 to 40 drops 3x daily, and/or . . .

2. *Scutellaria baicalensis*, ½ tsp 3x daily, and/or . . .

3. *Mucuna pruriens* (L-dopa precursor), 500 mg 1x day in morning.

H. Brain fog/Memory/Cognitive dysfunction, trouble finding words, add:

1. Phosphatidyl-serine, 100 mg 3x day, and/or . . .

2. *Ginkgo biloba*, standardized, 150mg 2x daily, and/or . . .

3. *Centella asiatica* (gotu kola), 500 mg 2x daily, or tincture 1/4 tsp 2x day (may cause headaches), and/or . . .

4. Taurine, 125 mg, 3x day.

5. Some of the following may also be of use: Phosphatidyl-choline, 500 mg 3x daily; *Cordyceps* powder (or tincture at the lower dose), 1 tsp - 1tbl 3x day; *Pueria lobata* (kudzu root), 500-1000 mg 3x daily or 1/4-1/2 tsp tincture 3x day; *Polygala senega* (Chinese senega root) tincture, 30 drops 3x day; *Hericium erinaceus* (lion's mane) 1 tsp powder 3x day or 1/4-1/2 tsp tincture 3x day; quercetin, 1200 mg day; pycnogenol (from french martime pine bark only) 100 mg 1x day; Vitamin D3, 5000-10000 IU day; *Bacopa monniera* (especially for short term memory help) 500 mg 2x day; homeopathic Kali Phos, 30C, 4 pellets 3x day.

I. With hypoperfusion of the brain, add:

1) *Ginkgo biloba* tincture (standardized), 1/4 tsp 3x daily, or standardized capsules: 125 mg 3x day.

J. With neural pain, add:

1) *Chelidonium majus* (greater celandine), tincture,1/4 tsp 3x daily, and/or . . .

2) *Pueria lobata* (kudzu) root tincture, ½ teaspoon 3-4x daily, and/or . . .

3) *Melissa officinalis* (lemon balm) tincture, ½ tsp 3-4x day, and/or . . .

4) Homeopathic Kali Phos 30C 4 pellets 4x day.

K. With “buzzing” or “electric feeling” in nerves, add:

1) *Sida acuta* (or equivalent species), tincture, 5-40 drops 3x day.

2) *Pulsatilla patens*, tincture 5-10 drops as needed.

3) *Piper methysticum*, i.e., Kava, 10:1 extract, instant powder, in cup of hot water (with honey and cream), as needed or desired.

4) Vitamin B-12, 1000 mcg sublingual.

5) Medical marijuana, smoke, or edible (indica, 5mg)

L. With epilepsy/seizures, add:

1) *Uncaria rhynchophylla*, increase dose up to 1 tbl 6x day depending on severity of seizures, and also take . . .

2) *Gastroida elata* tincture, 1/4-1/2 tsp 3-6x day.

3) *Salvia miltiorrhiza* may also be of help: increase dose to 1 tbl, depending on severity of seizures, 3-6x daily, and/or . . .

4) Cannabis oil or equivalent, variable dosages, and/or . . .

5) *Cryptolepis sanguinolenta* tincture may also be of help, ½ tsp 3-6x daily, and/or . . .

7) Taurine sometimes helps, 125mg 3x day.

8) Frankincense essential oil, applied topically, daily, to the temples and base of skull may help alleviate severity of seizures.

M. With left temporal strokes, add:

1. *Salvia miltiorrhiza*, increase dose, up to 1 tsp 6x daily, and/or . . .

2. *Uncaria rhynchophylla*, increase dose, up to 1 tsp 6x daily, and/or

3. *Ginkgo biloba* tincture (standardized), 1 tsp 3-6x daily, or standardized capsules: 600 mg 3x

day.

N. With subarachnoid hemorrhage, add:

1) Melatonin, 3-9 mg daily.

O. With bouts of unrestrained rage, add:

1) *Uncaria rhyncyophylla*, increase dose, up to 1 tsp 6x daily, and/or

2) *Cryptolepis sanguinolenta* tincture, ½ tsp 3-6x daily, and/or . . .

3) Tryptophan, 1,000-1,500 mg 3x day.

P. With feeling of brain being on fire, add:

1) Homeopathic gelsenium, 30C 4 pellets 4x day

Q. To restore neuronal structures, add neural regrowth stimulants:

1) *Polygala senega* (Chinese senega root) tincture, 30 drops 3x day, and/or . . .

2) *Hericium erinaceus* (lion's mane) powder, 3-8 grams per day or 1 tsp tincture 3-4x day.

R. Limbs feel heavy, add:

1) *Centella asiatica* (gotu kola) , 500 mg or 1/4 tsp tincture 2x daily.

3.1 Muscle twitches, tingling/crawling sensations/ numbness in extremities

A. General:

1) Vitamin B-12, 1000 micrograms daily (lower to 500 as symptoms resolve), and/or . . .

2) Vitamin B-6, 100 mg 2x daily (lower to 50 as symptoms resolve), and/or . . .

3) Folic acid, 400 micrograms daily, and/or. . .

4) Magnesium, 200-400 mg to 3x daily, and/or. . .

5) *Sida acuta* tincture, 5-40 drops 3x day, and/or . . .

B. With numbness, add:

1) *Polygonum cuspidatum* (knotweed root) tincture, ½ tsp 6-10x day, (note: especially useful for carpal tunnel- and lateral epicondylitis-type problems).

2) *Ginkgo biloba* tincture (standardized), 1 tsp 3-6x daily, or standardized capsules: 600 mg 3x day.

3) *Zingiber officinalis* (ginger) root, 2 ounces fresh juice, squeeze of lime, pinch of cayenne, honey to taste, in 8-10 ounces hot water, 3-4 cups daily.

3.2 With anxiety/ hysteria/extreme fear/panic attacks

A. General, add:

1) *Pulsatilla* (pasque flower) tincture, 10 drops each hour as long as necessary, and/or. . .

2) *Leonurus cardiaca* (motherwort) fresh plant tincture, 1/4 to ½ tsp to 6x daily, and/or . . .

3) *Corallorhiza maculata* (coral root), or equivalent species, 30 drops (full dropper) to 6x daily, and/or . . .

4) Homeopathic gelsenium, 30C 4 pellets 4x day

5) *Scutellaria baicalensis* tincture, 1/4 - ½ tsp 3x daily, and/or . . .

6) *Verbena officinalis* (vervain) tincture, 30 drops to 6x daily, and/or . . .

7) *Uncaria rhynchophylla* tincture, 30 drops to 6x daily, and/or. . .

8) Tryptophan, 1,000-1,500 mg 3x day.

3.3 With unconsolable anxiety

A. General, add:

1) Homeopathic aconite 30C 4 pellets dissoved in half cup water, sipped throughout day.

3.4 With sleep disturbance/insomnia

A. General, add:

1) Melatonin liquid, manufacturers directions, one hour before bed, and/or. . .

2) *Withania somnifera* (ashwagandha) tincture, 1/2 tsp one hour before bed; or powder or capsules, 1 gram an hour before bed, and/or . . .

3) *Scutellaria baicalensis* tincture, ½ to one tsp 3x daily, and/or . . .

4) *Leonurus cardiaca* (motherwort) fresh plant tincture, 1/4 *ounce* (yes, that is right) in liquid just before bed (if the melatonin does not help), and/or . . .

5) Suan zao rhen tang tablets/pellets, plum flower brand (5 tablets just before bed), and/or . . .

6) Te xiao zao ren an mian pian (sleepeace) tablets/pellets, 5 tablets just before bed, and/or . . .

7) Glycine, 125-375 mg daily, and/or . . .

8) Tryptophan, 1000 mg just before bed, and/or . . .

9) *Cannabis indica* gummies, 5mg just at bedtime.

B. For bolting awake in middle of night, add

1) Phosphatidyl serine (100 mg 3x day), and/or . . .

2) *Withania somnifera* (ashwagandha), ½ tsp tincture one hour before bed; or powder or capsules, 1 gram an hour before bed, and/or . . .

3) *Schisandra chinensis* tincture, 1/2 tsp just before bed.

4) Cannabis, various formulations.

3.5 Depression

A. General:

1) *Eleutherococcus,* 1:1 formulation, 1/4-1/2 tsp 3x daily (with a break every ten days), and/or . .

2) Melatonin, 3-9 mg day, and/or . . .

3) *Mucuna pruriens*, 500 mg 1x day in morning, and/or . . .

4) *Leonurus cardiaca* (motherwort) fresh plant tincture, 1/4-1tsp as often as needed, and/or. . .

5) *Corallorhiza maculata* (or equivalent), ½ to 1 tsp to 6x daily, and/or . . .

6) SAMe, 200 mg 1-2x day, and/or . . .

7) Tryptophan, 1,000-1,500 mg 3x daily.

8) Kratom (*Mitragyna speciosa*) powder, ½ tsp mixed in warm water, 1-3x day (may cause jitteriness – or nausea at higher doses).

3.6 Headaches

A. Migraine-like, add

1) *Verbena officinalis* (vervain) tincture, 1/4 to 1 tsp as needed, and/or . . .

2) Cannabis or CBD, variable dosages, and/or . . .

3) *Pueria lobata* (kudzu), ½ teaspoon 3-4x daily, (will also help prevent), and/or

4) *Scutellaria baicalensis*, tincture, 1/2 tsp 6x day in addition to core protocol dose, and/or. . .

5) Kava (*Piper methysticum*), 10:1 extract, instant powder, in cup of hot water (with honey and cream), as needed or desired, and/or . . .

5) Lithium orotate, 5-20 mg day.

B. With headache at back of head:

1) *Verbena officinalis* (vervain) tincture, 1/4 to 1 tsp as needed

C. At front of head:

1) *Silybum marianum* (milk thistle seed), standardized, 1200 mg every 3 hours, and/or . . .

2) *Rumex crispus* (yellow dock) root, tincture, 1 tsp in water at bedtime.

4.0 Cardiovascular System

A. Cardiomyopathy, general:

1) *Crataegus oxyacantha* (hawthorn), 120-900 mg 3x daily.

B, Blood clotting (thick blood):

1) Lumbrokinase (Nattokinase will work, Serrapeptase is too weak): 1-2 capsules, 2-3x daily. (NOTE: if you are already taking anti-coagulants, caution is warranted in adding either of these.)

C. Elevated heart rate (hypertension/tachycardia):

1) Specific: *Uncaria rhynchophylla* tincture, ½ tsp to 6x day.

2) *Crataegus oxyacantha* (hawthorn), 120-900 mg 3x daily, and/or . . .

3) *Leonurus cardiaca* (motherwort), 30 drops to one teaspoon to 6x daily, and/or

4) *Mimosa pudica* tincture, 20-60 drops daily. (Note: may also be of benefit if accompanied by depression, anxiety, headaches, and damaged nervous structures.)

D. Low pulse rate (hypotension):

1) *Glycyrrhiza* (licorice) tincture, 1 tsp to 6x daily depending on severity of condition (note: do not take for more than 60 days in this form), and/or . . .

2) Caffeine, variable dosing, (try rocket juice chai: a strong infusion of 2 heaping tbl black tea chai, 1 heaping tbl yaupon, heaping tbl yerba mate, heaping tbl kola nut, heaping tbl guarana in a French press,

let steep on hour, honey and heavy cream to taste), or . . .

3) If nothing else works: yohimbine as supplement, begin with dosing on bottle and increase as needed. (Please note warnings on label and use caution.)

E. Palpitations:

1) Specific, immediate:

a) *Scutellaria lateriflora*, 20-60 drops as needed or desired.

b) *Passiflora incarnata*, ½ to 1.5 tsp as needed or desired.

c) Kava (*Piper methysticum*), 10:1 extract, instant powder, in cup of hot water (with honey and cream), as needed or desired.

F. Angina

1) *Terminalia Arjuna* (aka, arjuna), 500 mg 3x daily.

2) Hartone capsules, 1-2 capsules 3x daily.

3) *Amni visnaga* (khella), 250 - 300 mg daily, and/or . . .

4) L-Carnitine, 500 mg 3x day, and/or . . .

5) *Crataegus oxyacantha* (hawthorn), 120-900 mg 3x daily, and/or . . .

6) *Salvia miltiorrhiza* tincture, ½ tsp 3-6x daily, and/or . . .

7) *Astragalus*, 1,000 to 4,000 mg, 3-4x daily.

G. Myocarditis

1) Mangiferin (Mangifera indica, standardized to 60% mangiferin), 1000 mg 3x daily, plus . . .

2) *Crataegus oxyacantha* (hawthorn), 120-900 mg 3x daily, and . . .

3) *Astragalus membranaceus*, 1000 mg 3x daily.

H. Cardiac fibrosis

1) *Terminalia Arjuna* (aka, arjuna), 500 mg 3x daily.

2) *Curcuma longa* (tumeric), 750 mg 3x daily.

3) *Polygonum cuspidatum* (Japanese knotweed root) tincture, 1 tsp 3x daily.

4) *Salvia miltiorrhiza tincture*, 1 tsp 3x daily.

I. With arrhythmia, add:

1) *Stephania* tincture (either species), ½ tsp tincture 3x daily, and/or

2) *Crataegus oxyacantha* (hawthorn), 120-900 mg 3x daily, and/or . . .

3) Taurine, 125-375 mg 3x day, and/or . . .

4) *Leonurus cardiaca* (motherwort), fresh plant tincture, 1/4 tsp 4x day.

J. With shortness of breath, add:

1) *Polygonum cuspidatum* (knotweed root) tincture, ½ tsp 3-6x daily, and/or . . .

2) *Astragalus*, 1,000 to 4,000 mg, 3-4x daily, and/or . . .

3) Liquid chlorophyll, 1 tbl in 20 oz water, once day, and/or . . .

4) *Cordyceps* powder, 1 tsp - 1tbl 3x day, and/or . . .

5) *Ailanthus altissima* tincture, 10 drops to ½ tsp 4x day.

K. With poor circulation (cold extremeties), add:

1) *Zingiber officinalis* (ginger) root, 2 ounces fresh juice, squeeze of lime, pinch of cayenne, honey to taste, in 8-10 ounces hot water, 3-4 cups daily.

5.0 Gastrointestinal Tract

A. Loss of taste: I have not yet been able to find anything for this, I am sorry. I will keep working on it.

B. Loss of appetite:

1) *Cannabis spp.*

C. Nausea:

1) Homeopathic nux vomica, 30C 4 pellets every hour, and/or . . .

2) *Mentha piperata* (peppermint) essential oil, ONE drop only, on tongue, followed by 6 ounces water.

3) *Moringa oleifera*, 1tsp powder in water 3x daily.

D. Vomiting:

1) Homeopathic arsenicum alb 200c, immediately, at first feeling of possible vomiting, as directed on label.

E. Cramping:

1) *Viburnum spp* (cramp bark), 30-90 drops to 4x daily.

2) *Pulsatilla patens* (pasque flower), 10 drops as needed, usually no more often than once per hour.

F. Diarrhea:

1) Blackberry root strong infusion (1/4 ounce to one ounce herb in one quart of hot water, cover and steep overnight – or decoction in acute episodes) strain and then drink throughout the day. Note: do *not* use blackberry tea bags *or* raspberry. Oak has minimal effectiveness. Blackberry root is the way to go. Rare to find any herbal company selling it, try etsy, it is always there.

2) *Ailanthus altissima* tincture, 1 tsp 3x daily or as needed.

G. Gastric reflux (ranges from lower esophageal burning to heartburn to GERD:

1) For lower esophageal burning: *Heracleum maximum* (cow parsnip) seed, 1-2 drops. Use at onset of burning, as needed. Note: *very* strong, resinous tincture, also excellent for hiatus hernia.

2) For GERD, mild to moderate, as well as lower esophageal burning:

a) Iberogast (google shopping), as directed on bottle.

b) Wu Zhu Yu Tang (evodia formula), liquid, as directed on label. (Note: evodia formula can be made by combining 2 parts ginger root, 1 part evodia fruit, 1 part Asian ginseng root, and ½ part Jujube.)

3) For GERD, severe: Sini Zuojin combination formula (as decoction or powder). This formula combines Sini powder extract and Zuojin pill as a treatment for severe GERD.

a) It is possible to buy Sini powder in individual packets as well as Zuojin pill in a bottle, then blend the two in hot water as a tea (see google shopping). This is by far the easiest way to create and use the formulation. I don't know how well it will work for severe GERD but many people do it this way. The clinical trials that show that this combination is useful for reducing or eliminating severe GERD all use a decoction, see b).

b) My preference, to buy the herbs in bulk (one pound of each, see google shopping, etsy, ebay, amazon) and create your own blend. Zuojin formula contains two herbs *Coptis chinensis* and *Tetradium ruticarpum* (aka evodia fruit) in a 6:1 ratio. To make (both herbs powdered): Take 6 ounces Coptis chinensis and 1 ounce evodia fruit and blend well.

Sini powder is composed of *Bupleurum chinese*, *Paeonia lactifolia* (white peony root), *Citrus aurantium* (Aurantii Fructus Immaturus), and *Glycyrrhiza* (licorice) in a 2:3:2:2 ratio. To make (all herbs powdered): take 2 ounces bupleurum, 3 ounces white peony root, 2 ounces fructus immaturus, and 2 ounces licorice and blend well.

Combine the two formulations together into one and prepare as decoction.

To make: Place the 16 ounces of herb into a large pot, add one gallon (128 ounces) water. Bring to boil, reduce to simmer, cook until liquid is reduced to 32 ounces. Note: this is always impossible to accurately

determine, so all of us guess while sounding scientific (aka mansplaining – "Ricky, you got some mansplaining to do"). The powdered herbs will soak up a lot of the liquid which will make it look like there is less water in the pot than there is. In any event, slow cook it till it looks like a lot of the water is gone but with a couple of inches still covering the wet, powdered herbs. Turn off the heat and let it cool. Strain and then press (wring out) the herbs (by hand) through a clean cloth. If the gods have smiled you will have 32 ounces or so of liquid left. If less you can add a bit more water, if more you can put the liquid back on the stove and cook it down a bit more. Keep cold, will last a week or so if refrigerated.

Dosage: One ounce of the liquid 4x daily. Will last 8 days. Repeat as necessary. This should, over time, reduce GERD to survivable levels or eliminate it entirely.

H. Leaky gut:

1) *Salvia miltiorrhiza* tincture, 1 tsp 3x daily.

2) *Althaea officinalis* (marshmallow) root, 1 tsp - 1 tbl powder in liquid, 3x daily.

3) Tumeric milk, 3x daily, see recipe section below.

4) Glutamine, 500 mg 2x day.

I. Ulceration/damage to bowel wall and epithelia:

1) Fresh juice of piece of green cabbage the size of a medium carrot (the core of the protocol – lowers inflammation, heals ulceration/mucosa), 3-4 fresh plantain (*Plantago spp*) leaves (if you can find them – look in the yard, the plant really does help heal the mucosa and lower inflammation), one medium beet, 4 stalks celery, 3 carrots. Daily in am and just before bed.

2) The chronic fatigue formula (see 1.1) will help heal the bowel wall as well as lower bowel inflammation and help normalize cytokines.

3) Although most herbalists no longer recommend it, I still use and am a big fan of comfrey root

powder for healing bowel ulceration, mucosa, inflammation. (The reason most people are skittish about the herb is due to concerns about the pyrrolizidine alkaloids (PA) in the plant; I don't consider these a problem for short term use and have never seen negative impacts from them in 35 years of practice when used short term). I add one tablespoon to the chronic fatigue blend or else simply use 1 tbl comfrey root powder, 1 tbl licorice powder, 1 tbl marshmallow root powder. Limited intake to 30 days. (If you have concerns about PA impacts on the liver, take with standardized milk thistle seed as dosed under the liver section, i.e. 6.0.) I have never found anything better for healing damage to the intestinal tract, even in cases where surgeons were prepared to remove large sections of the stomach or bowel due to ulceration.

6.0 Liver, elevated enzymes/inflammation

A. General:

1) *Silybum marianum* (milk thistle seed), standardized, 1200 mg 3x daily.

B. Liver pain, just under rib cage

1) *Salvia miltiorrhiza* tincture, 1 tsp 3x daily, and/or . . .

2) *Ceanothus* (red root) tincture, 1/4-1 tsp 3x daily, and/or . . .

3) *Schisandra chinensis*, tincture, 1/4-1/2 tsp 3x day.

C. Fibrosis: See 13.0

D. Cholangiopathy (i.e., Primary Sclerosing Cholangitis, bile duct damage):

1) *Silybum marianum* (milk thistle seed), standardized, 1200 mg 3x daily.

2) *Salvia miltiorrhiza* tincture, 1 tsp 3x daily.

3) *Curcuma longa* (tumeric), 750 mg, 3x daily.

E. Hepatitis (inflammation of liver):

1) *Silybum marianum* (milk thistle seed), standardized, 1200 mg 3x daily.

7.0 Fever

A. General, add:

1) *Eupatorium perfoliatum* (boneset), hot tea as often as needed.

2) *Sambucus* (elder) flower, hot tea, as often as needed.

3) *Mentha piperata* (peppermint), hot tea, as often as needed.

4) *Corallorhiza maculata* (coral root), or equivalent species, 30 drops (full dropper) to each hour depending on severity, and/or . . .

5) *Achillea millefolium* (yarrow), hot tea, as often as needed, or tincture, 10-30 drops as often as needed.

6) *Cryptolepis sanguinolenta* tincture, ½ to 1 tsp 3-4x day.

B. If severe, add:

1) Wash with cool cloth or in tub until fever lowers, and/or. . .

2) Dosages of above may be increased if very severe.

C. For relapsing/recurrent fever (Shaking chills/alternating sweats)

1) *Eupatorium perfoliatum* (boneset) tea, 3-6 cups daily.

D. Temperature fluctuations in the body: Serrapeptase, 2-3 capsules 3x daily.

8.0 Eye Problems

A. Specific for infected conjunctiva: *Isatis* infusion eyewash (prepared as with nettles), 1-2 drops in eyes, 3x daily. Keep refrigerated, will last a week. (If necessary you can also prepare as a decoction for a

stronger antiviral effect.)

B. Supportive (and for blurry vision):

1) Vitamin C, 1000 mg, 3x daily, and. . .

2) Zinc, 25-50 mg, once daily, and . . .

3) Lutein, 50 mg 3x daily, and . . .

4) Bilberry, 500 mg, 2x daily.

C. Floaters:

1) Stephania tincture, ½ teaspoon 3x daily, and/or . . .

2) Chlorella, 1 tablespoon, 3x daily, and/or . . .

3) Zeolite, liquid, 15 drops 3-4x daily, or powder (2 heaping teaspoons daily), or 3 capsules daily.

D. Photosensitivity:

1) Melatonin, 3-9 mg daily, and . . .

2) *Leonurus cardiaca* (motherwort), ½ to 1 tsp 3-6x daily, and/or . . .

3) Hericium erinaceus (lion's mane) tincture, 1/4 - ½ tsp 3x daily, and/or . . .

4) Lichi berries, eat throughout day.

9.0 Pain

A. General, add:

1) Pea Protein (Jarrow), one scoop every 8 hours, and/or . . .

2) Bryonia homeopathic 30C 4 pellets 4x day, and/or. . .

3) Arnica homeopathic, same dosage, and/or . . .

4) Hypericum homeopathic, same dosage, and/or . . .

5) *Corydalis* tincture, 1/8-1/4 tsp 3-4 x day (contraindicated in liver disease), and/or . . .

6) *Monotropa uniflora* (Indian pipe) tincture, 1/4-1/2 tsp hourly or as needed, and/or . . .

7) *Corallorhiza maculata* (coral root), or equivalent species, ½ to 1 tsp to 6x daily, and/or . . .

8) *Verbena officinalis* (vervain) tincture, 1/4 to 1 tsp as needed, and/or . . .

9) *Leonurus cardiaca* (motherwort) fresh plant tincture, 1 teaspoon to ½ ounce (yes, ounce) in water, as needed, and/or . . .

10) *Pedicularis* (lousewort) tincture, 1 teaspoon to ½ ounce (yes, ounce) in water, as needed, and/or . . .

10.0 Muscle weakness

A. General:

1) Blend of: *Pinus* (pine pollen) tincture, *Aralia naudicaulis* (or equivalent), *Panax quinquefolius* (American ginseng), equal parts of each, full dropper of the tincture 3x daily for 6 months (take by mouth, let sit a minute, then swallow – do not put in water), and/or . . .

2) L-carnitine, 1000 mg 3x day, and/or . . .

3) Taurine, 500-1000 mg 3x day, and/or . . .

4) Homeopathic lycopodium 30C, 4 pellets 4x day.

11.0 Swollen lymph nodes/sluggish lymph

A. General, add:

1) *Salvia miltiorrhiza* tincture, 1 tsp 3x daily, and/or . . .

2) *Phytolacca* (poke) root tincture, 5-10 drops 2x day, and/or . . .

3) *Galium aparine* (cleavers) tincture, (esp for nodules and cysts), ½ tsp 3x day.

12.0 Kidneys

A. To repair or inhibit further damage:

1) *Urtica dioica* (nettles): add 1-2 ounces of dried nettle leaf to a quart mason jar. Add hot water, let steep overnight, strain and drink throughout the next day. (Some people think they herb can be used again at least once more.) Do this every day. As well, take 1/4 tsp nettle seed tincture 3x daily, every day.

B. Frequent urination:

1) *Verbascum* root tincture, 10-30 drops to 6x daily. Will help restore bladder tone over time. Best, in this instance, if used with an endothelial normalizer and protectant such as *Salvia miltiorrhiza* or *Polygonum cuspidatum* tincture daily.

2) Ba-Wei-Di-Huang-Wan Chinese formulation, as directed on label (try acuatlanta as a source).

C. Proteinuria:

1) Tincture combination (equal parts) of *Salvia miltiorrhiza, Astragalus*, and *Angelica sinensis*. 1 tsp 3x daily.

D. Hematuria: same as C

E. Elevated serum creatine:

1) Avarai kudineer (ayurvedic blend, google shopping). 100 grams in 30 ounces water, bring to boil, reduce to simmer, simmer until reduced by 2/3 (note: all of us guess). Cool, press liquid out of herbs. Refrigerate, take 1 tbl 3x daily, Until gone, approx ten days.

F. Elevated urea nitrogen: same as E.

G. Extreme thirst:

1) Ba-Wei-Di-Huang-Wan Chinese formulation, as directed on label (try acuatlanta as a source).

H. Fibrosis: see 13.0.

13.0 Fibrosis in organs

A. To inhibit, reduce, or repair

1) Tincture formulation, equal parts: *Angelica sinensis, Salvia miltiorrhiza, Lonicera japonica, Polygonum cuspidatum, Cordyceps spp.* Dosage: 1tsp 3-6x daily depending on severity of fibrosis.

14.0 Reproductive System

A. Low libido, general:

1) chronic fatigue blend, see 1.1.

B. Low libido, men:

1) Pine pollen tincture. 10-30 drops, hold in mouth one minute, swallow slowly. 1-3x daily. Will raise testosterone and increase libido.

C. Protection from systemic damage:

1) The protocols for viral treatment will prevent or inhibit damage to the reproductive system.

15.0 Musculoskeletal Problems

A. Myalgia (muscle pain):

1) Pea Protein, one scoop every 8 hours or as needed.

2) Kava (*Piper methysticum*), 10:1 extract, instant powder, in cup of hot water (with honey and cream), as needed or desired.

3) CBD, as needed.

4) *Cannabis*, as needed.

B: Arthralgia (joint pain):

1) *Boswellia*, I prefer the superior labs formulation (amazon) which contains 500 mg Boswellia, 100 mg L-leucine, and 7.5 mg bioperine. Dosage as on bottle. Acute, 2-3x daily instead of once. The essential oil of Boswellia (frankincense) applied topically may also help.

2) Bromelain, I prefer the Toniiq brand (amazon), dosage as on bottle, in acute 1 capsule 3x daily.

3) Kava (*Piper methysticum*), 10:1 extract, instant powder, in cup of hot water (with honey and cream), as needed or desired.

4) CBD, as needed.

5) *Cannabis*, as needed.

C. Tremors and shaking: see 3.0, section G.

16.0 Skin Problems

A. Dry skin

1) Increase intake of fats and oils, specifically: avocado, olive oil, coconut oil.

2) Nettle leaf tea, daily, in quantity.

3) Burdock root, tea, daily, in quantity. Or capsules, 900 mg 3x daily.

B. Rash

1) General:

a) *Galium aparine* (cleavers tea) (lots daily) or fresh plant tincture, ½ to 1 tsp 3-6x daily.

b) Any of the following homeopathics can help, sometimes very much so: Apis, Hepar sulfur (Hep), Caladium (esp in asthma or lung disease), Histaminum, Arsenicum. All 30C, as directed on bottle.

2) With itching: homeopathic sulphur or homeopathic psorinum, both 30C.

C. Easy bruising: endothelial protective and regenerative herbs will help *(Polygonum cuspidatum* and *Salvia miltiorrhiza*, especially), but also:

1) Hesperidin, 100 mg 2x daily.

2) Rutin, 50-100 mg 2x daily.

3) Diosimin, 900 mg daily.

4) Pycnogenol,

D. Extreme skin sensitivity

1) *Leonurus cardiaca* (motherwort), 1 tsp 3-6x daily, and/or . . .

2) *Corallorhiza maculata* (coral root), or equivalent species, ½ to 1 tsp to 6x daily, and/or . . .

3) *Pulsatilla patens* (pasque flower), 10 drops as needed, usually no more often than once per hour, and/or. . .

4) *Gastroida elata* tincture, 1/4-1/2 tsp 3-6x day, and/or . . .

5) *Piper methysticum*, i.e., Kava, 10:1 extract, instant powder, in cup of hot water (with honey and cream), as needed or desired.

E. Hair Loss

1) Nettle leaf tea, in quantity, daily

2) Pea protein powder, as directed on label

3) Nutritional yeast (*not* enriched or fortified), 1 tablespoon daily.

17.0 To Lower Histamines

A) General:

1) *Petasites hybridus* (butterbur): 50mg 3x daily, and/or. . .

2) Inositol, 600 mg 2x daily.

B) Specific:

1) *Stachys palustris* (marsh woundwort), excellent but hard to get, 1 tsp 3x daily.

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