A Broader Conversation About Vaccines - Part #2
2019 Novel Coronavirus (CoVID-19): Part XVIII
2019 Novel Coronavirus (2019-nCoV (first named); COVID-2019 (later named disease); SARS-CoV-2 (final name of the virus causing COVID-2019), COVID-2019 Pandemic:

January 2, 2021 update Part 18 (Vaccines - Part #2)
Paul Herscu ND, MPH
Herscu Laboratory

A Broader Conversation About Vaccines

This Covid Update #18 is a companion piece to #17, and forthcoming updates #19, #20, and #21. The topic of vaccination is a difficult one, with a great deal of information and misinformation circulating. There is tremendous emotion, anxiety, fear and anger surrounding the topic of vaccines. The opinions here, are for your consideration. Make up your personal choice in consultation with your health care provider. But to help inform your choice, it is useful to have information. In this post, I briefly touch on some of the science for those interested in understanding vaccines in a broader context, and in learning about the different vaccine forms and how they relate to COVID-1 vaccines.

In the next update, I focus on the role organizational and educational institutions have in changing the course of this pandemic. What is the big ask we want from those in the position to effect change and how to shift the discussion and the focus of our efforts so they lead to better outcomes.

Update #20 will discuss the framework to understand vaccine reactions.

Lastly, I will take up the important topic of what you and your loved ones and your patients/clients might do to potentially prevent or mitigate side-effects from the vaccine if taken. I have broken this large topic up, as there is a lot to share from several angles!

This piece is about vaccines and how to think/talk about the topic in general, from the conceptual model, away from the operational specifics.

I am writing to those that actually believe we are in trouble here. (I had an interesting moment where Amy and I were presenting a talk for a professional organization last month and a physician there said something like, is this whole thing real? I have not seen anyone with this disease yet. I said, yes, very real. What I did not say was that right before our presentation, I had a patient who was waiting for a room in the hospital because the whole hospital was full, the ICU was full, the ED was full, and the hospital was setting up makeshift oxygen tents *in peoples' cars,* just to keep them alive until someone either got better or died and there was room in the hospital.) So, I am writing for you. Dealing with the reality and tragedy upon us.

At this point, for many, the discussion hovers at the for or against vaccinations point. Vaccinations are good or vaccinations are bad. **My goal is to permanently change this discourse so that it fits a bit closer to reality** and offers you, your family, and your patients a clearer way to think about vaccines. This discussion is the same one I have given in 1990, in 2000, in 2010, and now here, again in 2020. I hope, at some point this discussion can become more mainstream to move the actual conversation to where it belongs, mirroring reality, predicting outcomes, lessening harm.

Let's get started.

The first thing we have to bring up is that most people are arguing an issue using 1970s language and the reality of that time. Let's take this and see how quickly we can pull it forward to 2020/2021. Broadly and basically the concept of vaccination is introducing something into the body, let's say for example, an antigen, to produce an immune response, for instance, an antibody. It is much broader than that, but let's just keep it at that conceptual level. I will keep this brief, having followed the evolution of vaccinations for my entire professional career in one form or another, starting with the reading of Lady Montague's accounts and then Edward Jenner's account all the way through today.

I would like to branch this out into two types of vaccines. At this time, there are vaccinations used for ***prevention***, but there are also vaccinations used for ***treatment***, a topic not often mentioned. The old fight was about immunizing via vaccine, which focuses on *prevention*. Let's put that aside for now. But please realize we are in 2020. The concept has broadened into vaccines, of other sorts, including those used as part of a *treatment*.

The most compelling one here, from the orthodox medical model, are the immunotherapies that are used for cancer *treatment*. Many of them utilize the concept that you either inject an antigen, inject a protein, or inject another substance into the person in order to produce an immune response. The old one of these that led to TNF drugs, etc., some of you may recall, Coley's toxins, is something we have taught about for over three decades.

Some new approaches move beyond that by removing some of the immune cells, and by attaching chimeric antigen receptors (CAR) to T cells from the patient, and then are put back into the patient's body. Those cells find the cancer cells and destroy them. Broadly, these are the CAR-T or TCR therapies, or even the TIL cytokine additions.

Again, please don't write me about how you or your family used this approach and it cured or it was horrible or did nothing. I am just offering an example of another type of 'vaccine' used for *treatment* rather than prevention, to catch us all up to an expanded view of the topic.

Here's the takeaway: cancer therapy used to be limited to surgery, chemotherapy and radiation and now the thinking is more about stimulating the body's own immune system to address cancer cells. Focus here on the conceptual model, that putting something *into* the body so that the body will react in such a way as to create a specific or general immune response to *treat* a particular disease. We might call these by any name you prefer, but you can see the basic concept of vaccination at play.

Relatedly, in the integrative medicine world, 'vaccines' have moved on to **treatment** as well. There are any number of integrative doctors injecting peptides, protein pieces, and other materials into people to elicit a specific immune response, for a variety of diseases. When the political environment is welcoming, they call this a vaccine of sorts and when it is a less popular word, they call it a peptide antigen to elicit an immune response.

There are also those working with upregulating an immune response by use of traditional vaccines. For example, there are many integrative doctors that will inject a typical vaccine, such as yellow fever vaccine, into a person with a disease, say cancer, using the adjuvants in the vaccine to upregulate the immune system to recognize and address cancer cells.

There are many, many other examples, but as you can read, the topic of vaccinations is actually a large one, much larger than is often appreciated in the current debate. What to me sounds sort of funny, or sad, is when an integrative doctor that gives a vaccine to *treat* cancer say he is against vaccines for *prevention* of a potentially life threatening disease. It is not logical! Some have a knee-jerk response to words or labels, even when the words represent similar things.

I remember some years ago I was working on a vaccine position paper and there was a great amount of in-fighting in the group. It sounded to me like it all started in the middle of the argument, as if it was picked up from 50 years ago. I tried to make the point that even the folks that were 'pro' vaccines, that their practices which were against these newer cancer *treatments,* were not in keeping with their stated position on vaccine when it came to *prevention*, and some of those that were 'anti' vaccine for prevention were pretty happy with the newer cancer *treatments*. This discordance within a world view, simply due to the term used for the intervention, struck me as odd. After they listened politely, the argument returned. Which was sad to me. And an opportunity for further understanding lost.

REGARDING VACCINES FOR COVID-19, in December, 2020/Early January, 2021

Let me jump into the types of vaccines in general and then in COVID-19.
Different types of vaccines for *prevention.*
1. Nucleic acid, RNA/DNA vaccine. The new technology is designed to be developed in a quick and inexpensive way, and since they are new, no one is completely sure of the full short term or long terms effects. It takes a couple of months to get to clinical trials, and 6 months to get to Phase III trials. The mRNA has you making the antigenic protein within your cell. Your immune system reacts to the protein that your cell made from the mRNA message. At this time, there are about 20 of these in testing phases for COVID-19, from different companies. There are two major forms here, which I describe below. This form is potentially going to become a very dominant form of vaccine into the future for many diseases.

2a. Whole virus LIVE vaccine. Here you take the actual virus, keeping it alive but weakening its pathogenicity, in other words, creating a less pathological form. It keeps on replicating itself for a while which means it lasts longer than a killed form. MMR is like this one. There are a half dozen or so of these being developed for COVID-19. One big problem, theoretically, is that species often want to revert to their more natural form. Follow me here for a bit, from an evolutionary biological point of view, it is important. If you take a highly bred dog and let it run wild, it moves toward, in subsequent generations, a more feral 'wolf-like' appearance. Species do this, moving closer to the wild type variant since that is what nature created, as best adapted to the environment. Well, with live form vaccinations, there is the possibility that the virus might revert back to its stronger pathogenic state. This happens, in fact, and no one debates that this happens. So instead of arguing whether vaccines are 'good' or 'bad', I think it is more useful to talk about how to make this form safer.

2b. Whole virus, but DEAD/INACTIVE vaccine form. Here you take the virus but kill it, instead of weakening it, in order to create an immune response. Some vaccine makers add adjuvants to upregulate the immune response. While it is true that you cannot become sick with *that specific illness* from this form of vaccine, as it is dead, other reactions may occur. There are a half dozen or so of this type being tested for COVID-19.

3. Viral vector form of vaccines. There are around 20 COVID-19 vaccines of this form in experimental phases. This is a sort on interesting one. Here you use a common, simple, safer virus, like the one producing the common cold, *as a delivery agent* but you add a gene into the virus, and the virus does its usual thing, and it causes you to make a protein in question, for example, a spike protein. The virus keeps going for as long as typical, or you could introduce something else that stops its actions (I do not believe they are doing this yet, but this is clearly a pathway for cancer research, introducing a vector and then with it a 'suicide' gene to stop the process, so that it does not keep going, or stops the target in question. I know it sounds like science fiction, but I imagine this will be pretty common within 15 years or so.)

The main problem with this form is that we are dealing with three living agents, the bug you are trying to protect against, the bug that is the carrier, and you. The bug that is the carrier ideally is a simple one that we typically see and have no problem with. But if we typically see it, then we may well have antibodies to it already. And if we have antibodies to it, then when you undergo this vaccine form, it might be that your own immune system inactivates the carrier virus before it has a chance to deliver the gene of interest. There are all sorts of go-arounds here, but I thought I would highlight this.

4. Protein subunits vaccines are made from the surface of the pathogenic bug in question, like the spike protein of SARS-CoV-2, which you can upregulate by adding adjuvants. Here we have about 30 COVID-19 contenders in experimental phases. Again, you will not get the disease from this, even though it is up to your immune system to react to this protein or protein/adjuvant.

COVID-19 Vaccines

With COVID-19, we have the RNA/DNA option for now, as described above, and specifically the mRNA form delivering different parts of the SARS-CoV-2 antigen. The mRNA is not very stable, so you have to keep it at very low temperatures. Also, you have to somehow 'wrap' it up in a fatty coat, if you will. (Here there are issues, as for example the poly ethylene glycol that is included, which some people have a severe anaphylactic allergy to, which is known and clearly articulated.)

At this moment, in early January, 2021, the mode of administration is by injection, though my informed prediction is that in 6 months, an inhaled version will be added as a delivery system. As described above, the RNA causes your cell to produce this antigen, for now the one chosen is the spike protein, and then this is moved to the cell surface, at which point your immune system perceives the protein and starts producing antibodies to it.

The hope is, and what was borne out in clinical trials, is that the antibodies *keep you from getting severe illness* if you contract SARS-CoV-2, preventing patients from experiencing precipitous decline and leading to time in the ICU or worse. In a sense, your immune system has been primed to address the virus. Put another way, when you get sick, it takes time for your immune system to recognize that there is a problem, to identify the problem, and to then react appropriately to the problem. That valuable time allows the virus to replicate taking over more and more cells. If you could have get a head start so your body more quickly identifies a problem and reacts to it, then there is less virus to have to deal with in the body. That is how it is supposed to work.

Please note that I personally believe what is currently in these vaccines, is as stated by the manufacturers. In other words, I do **not** believe that they have added substances to control you, to track you, to kill you, to make you infertile, to control your thoughts, to add a kill switch to your life.

I know you might think that these are preposterous things for me to mention, but I have had people from the left and the right, conservatives and liberals both, tell me all of the above and more. I will not further describe or discuss any conspiracy theory, since they are both unproductive and unending. What can I say? There is a lot of confusing information out there.

Really, for me, this is an example of worrying about the wrong thing. There are things to absolutely be concerned about with vaccines, but worrying about something completely unrelated takes and keeps your focus off the main issues such as described below. My personal suggestion to anyone worrying about what is in a vaccine, take a sample and see what is in it. The chemistry is not that difficult to investigate, and really should not cost that much to do. Form a group, test the chemistry in the vaccine, describe what you find and move on.

Concerns with the mRNA

Moving on here. There are two potential forms here when speaking about mRNA; a **non-replicating form** of mRNA vaccine and the **self-replicating form** of mRNA.

The **non-replicating** form is what we now have as the approved vaccine. It is the kind you inject into the body, the body takes up the mRNA, it goes into the cell, causes the cells own production line to make the protein in question. And then eventually the job of these mRNA is done, they get used up, destroyed. To keep this from occurring *too* quickly or having too many unintended consequences, they sort of chemically 'freeze' the shape of the mRNA, and then coat the whole thing in a lipid substance, as mentioned above. It is kept from denaturing by storing at low temperatures. The Moderna and Pfizer version of the vaccine use similar mRNA code for the whole spike protein and similar lipid coat technology. I imagine in the future this whole form will be modified to make the vaccine more shelf stable. They may also modify the target, as for example, target for a part of the spike protein instead of the whole, or target for the spike protein plus another part for better specificity, but that is a future engineering challenge and keeps the same overall concept of this type of vaccine. More on this below.

The **self-replicating** type is an up and coming vaccine not approved yet. It would be the next version of these mRNA vaccines, where you create the system by which the mRNA keeps replicating itself inside the person, and therefore can last for an indefinite amount of time, continually producing more and more protein, before it is processed itself and ceases to be active.

I have grave concerns here. At this time, late December 2020/early January 2021, I really do worry about this. We have not seen what mRNA vaccines looks like in the real world. I mean what really happens over a large population, in different subgroups, over a span of months? But at least it is over sooner rather than later with the injection, in this first phase of vaccines. However, the **self-replicating form** would keep going for a while in the body, and that seems unnecessarily dangerous at this time. Put another way, if there is a problem with this whole mRNA concept then let's have at first the type that starts the immune response, ends its work and the immune system is prepared.

Having the mRNA go on and on indefinitely, as in the **self-replicating types**, seems like an unnecessary risk. At least for the first few years, until we have more answers from the epidemiology associated with this vaccine type. If I could make a VERY STRONG recommendation, it would be for the different medical societies to put the brakes on this form until we know more about the short-acting form. As an integrative medical society, this seems reasonable, and logical, and not at all

alarmist, but uses the precautionary principle. **This is something that can be written and acted upon today, not once they are developed and distributed.**

Clearly, these current vaccines have known side-effects, which FDA lists, and the vaccine makers provides. No one is saying that these are simply safe and carry no risk. No one has or will say anything close to that in the near future. The makers of these and the government both acknowledge known risks. And there are the unknown risks as well. But this is what I was underscoring in my previous update. The math is the math. At the start, there are multiple pathways open to halting an epidemic. But if you close off, prevent, underfund, or dismiss such other pathways, you are left with this one, with its potential risks and impacts. Sad but true.

There are specific populations that I worry about that have not been discussed elsewhere to date. Aside from those whose age, or who have specific ailments that put them at risk for certain problem from the vaccine, and those that may have the allergic reaction to the poly ethylene glycol, I worry about the upcoming vaccines and the adjuvants that may upregulate the immune system in unspecific manners.

There are numerous populations that this vaccine is complex, for me, as there is not enough information yet. For example, anyone with added hardware, medical devices and implants of various sorts. A vaccine is as good or as bad as how specific it is in its short term and long term effects. The more 'off target' it goes, the more problems it might cause. While this is not in the current plan, I STRONGLY URGE OUR INTEGRATIVE MEDICAL ASSOCIATIONS to emphatically urge the FDA in their post-approval tracking to add, NOW, at the beginning, specific tracking of side-effects of the vaccine on those with added internal/medical devices etc. These should be tracked carefully, as a potential subpopulation data points to be gathered. Even simpler procedures like cataract surgeries where new lenses are implanted, we should watch these people carefully.

As importantly, AND SOMETHING ELSE THAT OUR MEDICAL SOCIETIES SHOULD urge is special protocols towards vaccinations, which may include stopping or creating a time gap between particular procedures or treatments and the vaccine. I am trying to address the real world that we find ourselves in, and to diminish the risk of additional problems for ourselves, our families, our patients, and our neighbors. And if FDA will not pick up on this call, one very useful addition to our knowledge here is to have the integrative medical societies create a tracking system, and publish what we find. Simply put, from our point of view, we are not all the same, and do not respond the same to any exposure, including vaccines. Having people that specialize on personalizing medicine keep track and articulate latent subclasses is a huge benefit to society in general and to integrative healthcare in particular.

Hang in there. We are halfway through the topic. In the next update, we discuss what Integrative physicians and Naturopathic physicians can do, in particular, to help the current situation.

Kind regards,
Paul Herscu, ND, MPH