



Industrial Practice Good[^]Hygiene

December 2020

Vaccination Ruminations

It is that time of year again when everyone should be considering the upcoming flu season and our options for keeping that virus at bay. In addition to good hygiene measures such as cleaning of high contact surfaces and thorough and regular washing of hands, the Centers for Disease Control, or CDC, recommends that everyone six months and older get the annual influenza vaccination. We always think of the vaccine as “The Shot” but you might not be aware that there are actually several options.



There is, of course, The Shot, which is administered with a needle through the arm and protects against three or four of what are believed to be the most likely influenza viruses for the coming season, based on the current research. But if you

are 65 years of age or older, you might want to consider the high-dose flu vaccine which contains four times the amount of antigen (the part of the vaccine that helps your body build up protection against flu viruses). Another option for the 65+ crowd is an adjuvanted vaccine, which has an added ingredient to create a stronger immune response.

Needle not your cup of tea? There is a nasal spray flu vaccine which, for the upcoming flu season, has been developed to be effective against four flu viruses. However, there is an age range of 2 to 49 years old for this vaccination approach and people with certain medical conditions should not receive this type of vaccine. One should definitely consult with their primary physician before considering this approach. For the age group 18 through 64, the vaccine can be administered via jet injector - a process that uses a high-pressure stream of fluid to penetrate the skin instead of a needle. The Food and Drug Administration, or FDA, has issued a statement that the level of immunity associated with the jet injector process is similar to more conventional processes. You can check out all your flu vaccine options at the CDC website at this URL: <https://www.cdc.gov/flu/prevent/different-flu-vaccines.htm>

On the continued subject of vaccines, most of us wait with bated breath for the final approval and release of the COVID-19 vaccines...this week may actually mark the approval of the first. Currently there are at least 14 different candidates that have entered Phase III clinical trials, the final and probably most informative of the three necessary trials. All will not be available simultaneously, so one will have to consider their options and make an informed decision as to whether or not to go for the first vaccine that becomes readily available, or to bide their time and see what transpires as people throughout the world become vaccinated. The New York Times is a good resource for tracking the progress of the coronavirus vaccines: <https://www.nytimes.com/interactive/2020/science/coronavirus-vaccine-tracker.html>

Vaccinology, the science of vaccines, is a complex and complicated field of study. For the purposes of this brief article, it is sufficient to state that not all vaccines are the same. It is important to understand also that the FDA guidance for licensure of a vaccine is that it be proven to be at least 50% effective in either preventing disease or reducing the severity of the disease. As of right now, none of the vaccine producers know if the vaccine will prevent COVID-19 or lessen the severity of the symptoms. And the phase III trials, while very valuable, don't yield the necessary data to refine the effectiveness of each vaccine - that comes with years of use such as has been obtained for measles and polio vaccines.

Most vaccines rely on using a small amount of the targeted virus or one very similar as an active ingredient of sorts to trigger an immune response. A typical flu vaccine will contain the inactivated bits of the flu strains that are anticipated for a coming season. Two of the leading COVID-19 vaccine candidates are using a weakened version of a common cold virus (adenovirus) that additionally contain the genetic material of the SARS-CoV-2

spike protein. One vaccine is using a small piece of genetic material called mRNA - an approach never used for an infectious disease before.



It is indicated that future COVID-19 vaccines will require an initial injection and then a booster at some point later. This isn't actually unprecedented as some existing vaccines follow a similar "Prime-Boost" approach, but it does present logistical challenges for availability of the vaccine and scheduling of appointments for administering. Some of the vaccines will require storage at minus 80 degrees Celsius! One can be stored at a much lower temperature. Again, a matter of logistics and especially smaller communities with limited resources for storage will impact the distribution and administration of the vaccines that are eventually released. One of the leading vaccine candidates is using a cohort of 60,000 volunteers for their Phase III clinical trial while most of the others are using 30,000 folks. It is likely that the results from the 60,000 strong group will yield more meaningful data than the 30,000 cohort group. However, it will also probably push the availability of this vaccine out to later in 2021 as the members of any test group are volunteers, and there are goals for the cohort, such as older than 65, ethnicity, etc.

So, in readying one's self for the selection of a vaccine, there is much to be considered. And



obviously the majority of us do not have the training and knowledge to understand all of the science that goes into the development of each vaccine. Still, we will need to make a choice and that decision will be soon. So, stay informed to the extent possible, use reliable data sources such as the Mayo Clinic, the CDC, etc., consult with your physician when the time is near...and get a vaccine.



About the Authors

Glenn Hargrove and Jesse Phillips currently serve as the Practice Leaders for F&R's Industrial Hygiene group. Both maintain familiarity with the rapidly developing science and best practices related to SARS-CoV-2 (COVID-19) coronavirus and have vast experience with assessments for a wide range of microbiological agents including mold, bacteria, and viruses.

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