Addressing COVID-19 Vaccine Myths

Note: While this section was written with COVID-19 vaccines in mind, many of the general principles apply to other vaccines as well. Individual vaccines may vary in their antigenic components or dosage forms, but the principles of human behavior and good communication skills transcend most differences between vaccines.

The Issue

Misinformation about COVID-19 vaccines can be divided into two broad categories. One category can be thought of as misunderstandings: a person may not have the necessary background or knowledge for interpreting information. For example, a person who is concerned that vaccines could produce COVID-19 illness likely does not understand that the vaccines do not contain a live virus and therefore cannot cause infection. Misunderstandings can be addressed with factual information.

The other category can be thought of as myths, where "myth" is defined as an unfounded or false notion. Myths are simply not true. It is more challenging to address myths because discussions can devolve into debates or arguments. Nonetheless, it is important for pharmacists to be aware of some of the common myths that are circulating and the possible reasons for them.

Common Vaccine Myths

Myth: The COVID-19 vaccines were developed to control the general population by injecting microchips, "nanotransducers," or other tracking technologies.

Fact: There is no vaccine microchip; vaccines contain no transmissible material; and none of the COVID-19 vaccines can track people or gather personal information into a database.

This myth seems to have emerged after Bill Gates made a comment that "digital certificates" might be used as electronic documentation to show that a person had been tested or vaccinated for COVID-19. The technology he was referencing is not a microchip and has not been implemented in any manner.

This myth also might be tied to the May 2020 announcement of a contract between the U.S. government and ApiJect Systems America. The contract was intended to dramatically expand domestic production capability for ApiJect's single-dose prefilled syringes that might be used for COVID-19 vaccines. An optional version of the prefilled syringe would contain a microchip within the syringe label; the microchip would help vaccine providers confirm that a dose had not expired and was not counterfeit. In that optional version, the microchip was part of the outer label—not inside the syringe—so it could not be injected into the person receiving the vaccine. (The ApiJect prefilled syringe ultimately was not used for the vaccines.)

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Myth: Receiving a COVID-19 vaccine can cause a person to become magnetic.

Fact: Receiving a COVID-19 vaccine will not make anyone magnetic, including at the site of vaccination (usually the arm).

COVID-19 vaccines do not contain any ingredients that can produce an electromagnetic field. All COVID-19 vaccines are free from metals such as iron, nickel, cobalt, lithium, and rare earth alloys as well as any manufactured products such as microelectronics, electrodes, carbon nanotubes, and nanowire semiconductors. In addition, the typical dose for a COVID-19 vaccine is less than 1 mL; that volume is too small to allow magnets to be attracted to a vaccination site even if the vaccine were filled with a magnetic metal.

Myth: COVID-19 vaccines cause infertility in women—maybe men too.

Fact: All evidence shows that vaccines cause no fertility problems, including COVID-19 vaccines. Additionally, there is no evidence that COVID-19 vaccination causes any problems with pregnancy, including the development of the placenta.

According to an Associated Press "fact check," the rumors about infertility can be traced to an article published by a blog called "Health and Money News" around the time the Pfizer-BioNTech vaccine was authorized (late 2020).[1] The article introduced the false claim that the spike protein found on the surface of SARS-CoV-2 is the same as another spike protein—the functional envelope glycoprotein syncytin-1 that is involved in the growth and attachment of the placenta during pregnancy. The article speculated that because of the similarity, vaccine-generated antibodies to SARS-CoV-2 also would attack syncytin-1, thereby affecting fertility in women.

The SARS-CoV-2 spike protein and syncytin-1 do share an amino acid sequence. However, a Pfizer spokesperson confirmed that this sequence "is too short to plausibly give rise to autoimmunity."[1] There is one small similarity, but the overall molecular shape of syncytin-1 is completely different. As one expert put it, saying the spike proteins on the surface of SARS-CoV-2 and syncytin-1 are the same "is [like] saying that two people share the same Social Security number because they both contain the number 6."[2] As for the idea that the body could get "mixed up" and attack syncytin-1 instead of SARS-CoV-2, another expert drew the analogy that it would be "like [a person] mistaking an elephant for an alley cat because they're both gray."[1]

An American College of Obstetricians and Gynecologists (ACOG) Practice Advisory states that "claims linking COVID-19 vaccines to infertility are unfounded and have no scientific evidence supporting them."[3] ACOG strongly recommends vaccination for all eligible persons 12 years of age and older, including individuals who are pregnant and/or lactating, actively trying to become pregnant, or contemplating pregnancy.

The idea that a COVID-19 vaccine could affect male fertility may be related to the fact that some men develop a fever after vaccination. Fever can temporarily suppress sperm production. Other than that remote association, all evidence shows that no vaccine affects male fertility, including COVID-19 vaccines.

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Myth: The COVID-19 vaccines are "shedding" or releasing their components and causing problems in unvaccinated people.

Fact: None of the ingredients in any of the COVID-19 vaccines can leave the body after injection, so nothing can be transferred from one person to another.

The myth goes something like this: because vaccinated people are shedding vaccine material, being near someone who received a COVID-19 vaccine can affect you in a manner like secondhand smoke. Purported negative effects include abnormal menstruation and miscarriage.

The origin of this idea is somewhat convoluted. The term "vaccine shedding" has been used in previous anti-vaccination campaigns to describe the risk of infection due to vaccine-induced viral shedding. Although viral shedding is possible with some vaccines—mainly live attenuated vaccines—the level of shedding is considered to be inadequate to result in infection.

With COVID-19 vaccines, the term "vaccine shedding" is being used to describe the release or discharge of any vaccine component outside the body. This is not biologically possible because COVID-19 vaccines are not live virus vaccines.

Myth: Being near someone who received a COVID-19 vaccine can affect a person's menstrual cycle.

Fact: Some people who received a COVID-19 vaccine reported changes to their menstrual cycle. A finding of small changes in menstrual cycle length has been found in several studies.

But there is no evidence of (and no possible vaccine-associated mechanism for) changes in unvaccinated persons.

In a recent survey of a convenience sample of currently and formerly menstruating people, 42% of respondents with regular menstrual cycles reported bleeding more heavily than usual after COVID-19 vaccination, while 44% reported no change.[4] Among respondents who typically do not menstruate, 71% of people on long-acting reversible contraceptives, 39% of people on gender-affirming hormones, and 66% of postmenopausal people reported breakthrough bleeding after COVID-19 vaccination.

The authors emphasized that these associations could not establish causality. Importantly, these changes were reported by vaccinated individuals, not unvaccinated ones. There is no mechanism by which COVID-19 vaccines could induce changes in unvaccinated individuals. Many things can affect menstrual cycles, including stress, changes in your schedule, problems with sleep, and changes in diet or exercise. Infections may also affect menstrual cycles.

Additionally, the National Institutes of Health reported that women who received COVID-19 vaccines had a less than 1-day increase in the length of their menstrual cycles around the time of their doses. The findings suggested that women may have a slightly longer menstrual cycle after COVID-19 vaccination, but the change is temporary and within the range of normal variation.[5]

Myth: COVID-19 vaccines are killing more people than the virus itself.

Fact: No, they are not.

In May 2022, the United States passed the level of 1 million deaths attributable to COVID-19. The number has continued to climb since then.[6]

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By comparison, the Vaccine Adverse Event Reporting System (VAERS) had received roughly 20,000 preliminary reports of deaths among people who received a COVID-19 vaccine.[5] This represents a tiny fraction of the more than 7 million vaccine doses administered in the United States.[7] Moreover, the U.S. Food and Drug Administration requires health care providers to report any death after COVID-19 vaccination to VAERS, even if it is unclear whether the vaccine was the cause. Reports of adverse events to VAERS following vaccination, including deaths, do not necessarily mean that a vaccine caused a health problem.

This myth is complicated by information that circulated on social media stating that the mortality rate of COVID-19 is only 1% to 2%, so people should not be vaccinated against a virus with such a "high" survival rate. The first part is true: the current observed case fatality ratio is between 100 and 200 deaths per 100,000 population.[8] Contrast this with seasonal influenza, which caused 1.8 deaths per 100,000 population during 2020.[9] Even when deaths from both influenza and pneumonia are considered, the mortality rate was 16.3 deaths per 100,000 population. The COVID-19 mortality rate is almost 8 times higher.

Myth: COVID-19 vaccines are causing a new illness called vaccine-acquired immunodeficiency syndrome (VAIDS).

Fact: VAIDS is not a real condition. All evidence indicates that COVID-19 vaccines do not cause immunodeficiency. On the contrary, vaccinations stimulate the immune system to help the body fight off infection and disease.

Some social media and news outlets claimed that COVID-19 vaccines (particularly booster doses) contain "HIV particles" that cause VAIDS. There were calls online for people who had received COVID-19 vaccines to get tested for HIV. There is no connection between COVID-19 vaccines and HIV.

VAIDS also has been called "immune erosion," or the gradual destruction of the human immune system by vaccines. There is no evidence that any COVID-19 vaccine weakens or destroys the immune system. It is possible that some people misinterpreted reduced effectiveness of the vaccines against infection with emerging SARS-CoV-2 variants as evidence of immune deficiency.

Myth: If you die after getting a COVID-19 vaccine, life insurance companies will not pay out on the policy.

Fact: Getting a COVID-19 vaccine will not affect whether a life insurance policy pays out in the event of death.

Like many COVID-19 vaccine myths, this one can be traced to social media. Initial posts claimed that a friend's relative had died after receiving a COVID-19 vaccine and the life insurance claim was denied because the relative had willingly taken "an experimental vaccine." The myth persists even though the most widely used vaccines (Pfizer-BioNTech's Comirnaty and Moderna's Spikevax) now have full U.S. Food and Drug Administration approval.

To address the misinformation that a COVID-19 vaccine could be a factor a life insurer considers in the claims-paying process, the American Council of Life Insurers issued the following statement:[10]

> *The fact is that life insurers do not consider whether or not a policyholder has received a COVID vaccine when deciding whether to pay a claim. Life insurance policy contracts are very clear on how policies work, and what cause, if any, might lead to the denial of a benefit. A vaccine for COVID-19 is not one of them. Policyholders should rest assured that nothing has changed in the claims-paying process as a result of COVID-19 vaccinations.*

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