

MATTHEW DOUST '98

Combating Coronavirus

According to the *Washington Post*, one person in the United States died of the coronavirus every 28 seconds during the month of January. At the same time, scientists and physicians across the nation and world were working to bring additional vaccines to market to combat the virus.

The Hope Research Institute, based in Phoenix, Arizona, is doing its part, partnering with pharmaceutical companies engaged in vaccine development to conduct Phase 3 clinical trials for coronavirus vaccines. In August 2020, they began trials for Pfizer and Moderna, then partnered with Janssen and AstraZeneca, and now Novavax and Inovio. "It's been very easy to recruit subjects," says Matthew Doust, MD '98, a partner in the Institute. "People just want to move past this. In the first 48 hours after we went live to enroll patients on our website, we had several thousand people sign up."

Doust is an anesthesiologist who specializes in pain management and treats patients at the Pain Center in Phoenix. Seventeen years ago, he and some of his medical partners opened the Hope Research Institute, initially to conduct studies related to pain management. They have been involved in virtually all of the device trials for spinal cord stimulators over the past 10 years and served as the primary clinical site to test Nevro's high-frequency spinal-cord stimulator system.

But over time, that niche has expanded to include vaccine studies. When COVID-19 first hit the United States in early 2020, the institute was finishing up a clinical trial for Pfizer on a vaccine for *Clostridium Difficile*, a gastrointestinal infection, and had conducted a recent trial on a vaccine for dengue fever. "We also had previous involvement with Moderna, AstraZeneca, and Johnson & Johnson," says Doust. "We let them know we were interested in being involved with their trials and it took off from there."

Doust believes the speed with which these vaccines were developed and brought to market is a tremendous accomplishment. "You can't underestimate the importance of biotechnology," he says. "The fact that they were able to sequence virus, come up with genetic constructs, and design appropriate vaccines and bring them to market essentially seven to eight months later is really impressive. Some of the vaccine studies we've been involved with have gone on for a couple of years."

Doust says it's also unique that several vaccines to treat the same virus are being tested at once, especially

since pharmaceutical companies have taken different approaches in their vaccines to combat the virus. While the Pfizer and Moderna vaccines use mRNA technology, the Johnson & Johnson and AstraZeneca vaccines take a more traditional approach using adenovirus viral vectors, and the Novavax vaccine employs a new proprietary technology called a recombinant spike protein nanoparticle. "They're basically injecting a protein that looks exactly like the spike protein you see in coronavirus that creates an immune response," he explains.

Doust stresses that the speed in which the vaccines were developed should not make people question their safety. "There are certainly people who are hesitant about a vaccine without a long track record or that they don't understand," he says. "As physicians, we need to be leaders in this phase and help patients address their fears," he says.

That may require a discussion about the science of how mRNA works. "It's taken into the cell, but it's not taken into the nucleus so it's not going to be permanently implanted into your DNA. I think that's what a lot of people are concerned about, but when I sit down and have a conversation in simple terms with patients and staff, most of them are able to kind of get past that pretty quickly," he says.

Doust says Hope Research continues to follow patients in the trials as part of safety studies and patients who received placebo vaccines as part of Pfizer and Moderna trials have been brought back to receive the actual vaccine.

Doust had the Pfizer vaccine himself early this year with no complication but a sore arm. "I had to wait my turn like everyone else," he says.

It was a full-circle moment. "I've never been involved in a study and then gotten what we were studying," he says. "For me, that was very interesting."

—Renée Gearhart Levy



Matthew Doust, MD '98, with his wife and children in Phoenix.