



The Miller Report

Mendocino Coast COVID-19 Update for the Week of April 27, 2020.

by

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From William Miller, MD, our hospital's Chief of Staff:

There are two different types of tests for COVID-19 caused by a coronavirus named CoV-SARS-2. These tests either use something called PCR to detect the genetic material of the virus by swabbing either the nose or the back of the throat; or test blood for the presence of antibodies to the virus. Let's look at each to understand their value and limitations.

PCR stands for polymerase chain reaction, which is a way to duplicate genetic material in a sample to literally millions of times over. Thus, you could theoretically take a single strand of DNA and duplicate it to the point that there are now millions of identical copies. The power of this is that it makes it millions of times easier to then detect the presence of that genetic material. This technique is used in many things from looking for someone's DNA at a crime scene, to detecting viruses. It is an extremely powerful technique. It is also very specific to just the particular virus you are looking for. If you get a good sample and the test is run correctly, it has very low false positive and false negative rates.

You may have heard about some problems with the early PCR test developed by the CDC for COVID which was released in March. The problem was that one of the reagents was faulty giving a high false positive rate. At MCDH, we are using a different test developed by Abbott. You may have heard about a problem that the Cleveland Clinic had with the Abbott test. It was reported in the news that the Abbott test had a lot of false negatives. However, it turns out that they were not collecting the sample correctly which was leading to the false negative results. While every test will always have those few erroneous results, PCR in general is a technique that without question gives some of the highest reliabilities of any test we do in health care. The primary limitation of PCR testing is that it only tells you that you have the virus now, it doesn't tell you if you had it in the past or whether you are immune.

There has been a lot of excitement recently about antibody tests, also known as serology tests because it is done on a blood sample. First, you need to know what an antibody is. When virus or bacteria invades our body, the lymphocytes in our immune system try to make antibodies against proteins on the virus surface. These antibodies then are released into our blood stream and when they encounter the virus, they stick to that protein on its surface that they are designed to go after. This then allows other cells of the immune system to hook onto the virus and destroy it. It takes a while for the immune system to create antibodies to a virus the first

time you get infected and during that time, the infection can really get ahead of the immune system. However, after infection is eliminated, the antibodies may remain in the blood stream for a long time, ready to go again if there is ever another attack. This “memory” is what is involved in developing immunity. Vaccines work by taking a viral protein that when injected into a person will cause protective antibodies to be formed and give immunity without having to go through the illness. A very important thing to know is that *not all antibodies lead to immunity*. In other words, the presence of antibodies to the COVID virus does not guarantee immunity. There are many factors that play into whether an antibody gives immunity or simply indicates prior infection. The only way to know if a particular antibody gives immunity is to study the behavior of the disease in a large population of people over a long period of time to see who gets the disease a second time and who does not. We simply have not had that much time to tell with COVID-19.

A test for antibodies uses proteins similar to those found on the virus and tags them with a marker. These tagged proteins are then mixed with the blood (serum) from a person and if there are antibodies to that protein present, then they stick to the test protein and are thus detected. The biggest potential problem with the current tests being promoted for COVID is cross reactivity. This means that a person may have antibodies to *a coronavirus* because of a previous exposure, but was it *the COVID-19 coronavirus*? There are many different strains of coronavirus that go through our population every winter causing the “common cold.” Since they are all coronaviruses, they tend to have very similar if not the exact same proteins on their surfaces. If you read the fine print on these tests and if the manufacturer is giving an honest disclosure, you will discover a list of other strains that would give you a false positive. I am not aware of any antibody test for COVID that has been touted thus far that does not have this limitation to at least some degree.

If you combine the problems with false positives due to cross reactivity and the uncertainty as to whether a true positive means immunity or not, then the risk is that someone who gets a positive test and thinks that they are safe will no longer take steps to protect themselves or others. If they are not immune like they think, then they may get COVID-19 and spread it to others with serious consequences.

The Food and Drug Administration (FDA) is responsible for ensuring that all of these tests work correctly and are very accurate before they are released to be used on the public. However, due to the urgent nature of this crisis, there has been a suspension of much of the regulatory safeguards that would normally be required. As a result, we have a remarkable number of both PCR and antibody tests coming out. I suspect that many will, in the end, fall by the wayside as not being accurate enough. I am more confident in the PCR tests. As for the antibody (serology) tests, it is my opinion that it is way too early to rely upon any of them for much meaningful information at this time.

At MCDH, we are expecting to be able to offer the PCR test to the general public soon. This is being done in concert with the Sonoma County Health Department and UCSF. We have not yet received any of the test kits that we requested, but will put out an announcement as soon as we are able. We expect to be able to do about 300 tests per week. The Mendocino Coast Clinic has already begun participating in this program and has tested a number of local homeless people through its Street Medicine Program.

From Tabatha Miller, our Fort Bragg City Manager:

Last Wednesday, April 22nd, Mendocino County, Mendocino Coast Clinics, Coastal Street Medicine, Mendocino Coast Hospitality Center and the City of Fort Bragg collaborated to launch community surveillance testing for COVID-19. Surveillance testing is used to determine if undetected community spread is present. No one tested showed any signs of the virus. That's the point. It is this type of testing that helps us to understand the spread or lack of spread of COVID-19. It is the testing we need to safely ease or lift the shelter-in-place orders.

The Fort Bragg Group was provided 120 COVID-19 test kits. While this is a small number when you consider the number of residents in our City, it represents 16.2% of the total 739 test taken as of April 27th. Trying to figure out how best to allocate 120 tests in our community was one of the challenges. Originally, the idea was to open it to anyone who wanted to be tested. Almost everyone wants to be tested, so crowd control was a large concern. The better question is whose results benefit the data and the community. The answer is those individuals who interact with the public and are at the greatest risk.

These tests were administered in the City to asymptomatic essential workers and other vulnerable populations. The essential workers included local law enforcement officers, health care staff, delivery personnel, food service workers, and social service providers. Prior testing was conducted at Sherwood Oaks and all test results were negative.

Coastal Street Medicine and Mendocino Coast Hospitality Center administered the first round of testing to those experiencing homelessness, those who are being sheltered at local motels, and the staff in direct contact.

The second round of testing occurred in the parking lot of Mendocino Coast Clinics. Testing was done on essential workers from our community. City staff scheduled appointments to allow for efficient traffic flow and to ensure everyone stayed in their vehicles so as not to put anyone at risk. At the end of the afternoon, 71 individuals were tested via oral swab (mouth not nose). These tests were expedited to the Sonoma County lab by Mendocino County Public Health. Twenty tests were analyzed there and the other 100 were sent to University of California San Francisco (UCSF) Medical Center.

Typically, the results for the COVID-19 swab test take up to 48 hours, we hoped for results on Friday and it is now Tuesday, almost a week later. As of writing this article, we know that the first 101 tests processed were negative and one was damaged in transit and couldn't be used. We await the results of the other 18 tests. Like testing across the country, the labs are backed up and one major limiting factor is the lack of swabs.