Memo

To: Allina Health Laboratory affiliate clients

From: Allina Health Laboratory Outreach services

Date: April 22, 2020

Re: COVID-19 serology (antibody) testing

Allina Health Laboratory is focusing resources on SARS-CoV-2 molecular (RT-PCR) testing in preparation for the expected increase in COVID-19 patients. RT-PCR is currently the only method that can diagnose or exclude SARS-CoV-2 infection. We are working to increase collection supplies and molecular testing capacity for our hospitals and clients to support surgery and other needed hospital services before the surge. Although we plan to evaluate serology (antibody) testing for SARS-CoV-2 in the near future, this is not an immediate priority for our technical or sendout resources. Current evidence indicates that while serology may be useful for epidemiologic purposes, at this point in the pandemic, serology results can't be used for clinical care, specifically:

- Serology results don't reduce PPE utilization
- Serology results can't be used to implicate authentic infection, protective immunity, or to rule out infection

Overview of SARS-CoV-2 Serology testing:

Serology detects presence of antibodies (IgM, IgA and IgG) in blood, produced as a result of immune response to SARS-CoV-2 virus infection. Because COVID-19 is a new disease, currently available serology tests were released without a full clinical validation and, despite vendor claims, the true clinical utility and accuracy is not yet known. The international laboratory community has reported problems with accuracy when the tests are used on real-world specimens from patients who had lab-confirmed COVID-19 infection and specimens collected prior to the pandemic.

At present, IgG antibody appears to be the most useful serologic marker for SARS-CoV-2 exposure.

- IgG antibody typically appears 1 to 2 weeks after acquiring the infection, so IgG testing is generally recommended 14 days after onset of symptoms
- IgM and IgA are considered markers of acute infection; however, it still takes one week or longer for these antibodies to be detectable in most patients, making them limited as markers of recent infection. Compared to IgG antibody testing, tests for IgM and IgA antibody have a concerning false positive rate in studies using real-world specimens

- Lab-based IgG assays (vs. rapid cartridge tests) have the highest sensitivity and specificity for SARS-CoV-2 antibodies, and are the only methods that can provide a quantitative value

Limitations of SARS-CoV-2 Serology (Antibody) testing

- Cannot rule out infection
- Positive results may be due to either past or recent infection with common coronavirus strains known to cause 5-10% of all viral respiratory illness, so a positive test may give false reassurance of immunity to SARS-CoV-2 virus
- There is no confirmatory method available to distinguish true positive from false positive antibody results, such as we have for Lyme disease where a positive Lyme antibody screen is followed by Western Blot
- The titer or serum level required to confer protection is unknown
- The duration of protection conferred by the antibody is unknown
- Some infected patients, such as those who are immunosuppressed, do not develop detectable antibodies
- Some patients with antibodies may still have SARS-CoV-2 detected by RT-PCR. It isn't clear whether such patients are still infectious

Potential benefits of SARS-CoV-2 serology (antibody) testing

- Potential identification of individuals who have been exposed to the infection (symptomatic or asymptomatic) and developed an immune response. It is hoped that in the future, this test can help to determine individuals who are no longer susceptible to infection and can return to work
- Potentially identify individuals who are at risk for infection
- Gives CDC surveillance data needed to know national prevalence of disease and plan response to a pandemic
- May be helpful in the future to identify potential convalescent plasma donors but is not currently used to select donors

References:

Abbasi, J; The Promise and Peril of Antibody Testing for COVID-19; JAMA, April 11, 2020.

FDA; Important Information on the Use of Serological (Antibody) Tests for COVID-19 - Letter to Health Care Providers, April 17, 2020