

There are also simply not enough data at this time to infer a correlation between detectable SARS-CoV-2 viral RNA and infectiousness. We do not know how much virus (as measured by detecting viral RNA) is needed in a respiratory specimen for a person to be able to transmit it to someone else. We also do not know what the “cutoff” is for a person to no longer be infectious (i.e., at what point the amount of virus in a person’s respiratory specimen is too little for them to be able to infect others).

Do Ct values correlate with viral load?

Short Answer: Often, but not always

There is a relationship between Ct values and amount of virus in a patient specimen, but they are not equivalent. There are many variables that impact Ct values (see above). Although Ct may be used as a proxy for viral load, caution must be taken when interpreting in this manner. A high Ct value often correlates with a low viral load, but not always.

A specimen could have a very high viral load, but also a high Ct value (i.e., it took more cycles to detect the viral RNA) because the extraction was inefficient, the patient just drank something that inhibited the real-time PCR reaction, or the specimen was packaged inappropriately and reached a high temperature during transportation to the lab and the viral RNA in the specimen degraded in the heat.

Any specimen that generates a result that is defined as “positive” by the test manufacturer is considered positive. As with any diagnostic test, the result should be interpreted in the clinical context.

The process of viral replication and infection must be taken into consideration as well. If a specimen is collected very close to the time of the initial infection the viral load may be very low as the virus has not had a lot of time to replicate; a specimen collected in the coming days may have a much higher viral load. A specimen collected many days to weeks after the initial infection may have a low viral load, and viral RNA can be detectable for many weeks after infection in some patients. Limited epidemiological and culture data indicate that patients are not infectious more than 10-15 days post-onset of symptoms.

Can I compare a Ct value from one test method to another?

Short answer: No

Ct values and cutoffs are assay- and method-specific. A specimen with a Ct of 35 by one assay will not necessarily have the same Ct value by other assays. These values can vary up to two to three logs from test to test due to how the tests are designed.¹

There can be a difference in the relative sensitivities of FDA authorized tests which may also impact Ct values. According to comparison data recently published by FDA using a standard panel, there can be as much as a 1000-fold difference between the various assays.²

Why don't labs report Ct values on their reports for NAATs?

Short answer: This would be a regulatory violation

All currently-available nucleic acid tests for SARS-CoV-2 are FDA-authorized as qualitative tests, and Ct values from qualitative tests should never be used to direct or inform patient management decisions. Therefore, it would be a regulatory violation for laboratories to include Ct values on patient reports.

Can Ct values be used to inform infection control decisions?

Short Answer: We need additional data

The amount of detectable viral RNA in an infected individual is quite low in the first few days after infection, then rises exponentially for several days before dropping back off. It is reasonable to conclude that this period of peak viral load is when the infected individual is most capable of transmitting the virus to others, and when their specimens will have

¹ D. Rhoads, DR Peaper, RC She, FS Nolte, CM Wojewoda, NW Anderson, BS Pritt. College of American Pathologists microbiology committee perspective: Caution must be used in interpreting the cycle threshold (Ct) value. *Clin. Infect Dis.* (2020), [10.1093/cid/ciaa1199](https://doi.org/10.1093/cid/ciaa1199)

² FDA [SARS-CoV-2 Reference Panel Comparative Data](https://www.fda.gov/media/142424/download) webpage.

