

Prolonged PCR positivity in COVID-19 health care workers - Implications for practice guidelines

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Abstract (maximum 50 words; word count 50 words)

Current DoH guidelines specify that HCW with COVID-19 infection must be PCR negative on at least two consecutive specimens before return to work. Of eleven HCW, the median time from PCR positivity to the 2nd negative swab was 32.5 days (range 11-53 days). Revision of DoH guidelines may be warranted.

Manuscript body (maximum 350 words; word count 350 words)

Healthcare workers (HCW) are at occupational risk of COVID-19 infection and may act as vectors of transmission. Department of Health (DoH) guidelines prioritise HCW as a risk group for diagnostic testing (1, 2). After confirmation of diagnosis, in addition to resolution of symptoms, polymerase chain reaction (PCR) negativity on at least two consecutive respiratory specimens collected 24 hours apart and at least 7 days after symptom onset is required before HCW return to work (1).

Since 10 March 2020, there have been 11 HCW managed at our hospital diagnosed with mild COVID-19 infection not requiring hospitalization with repeated specimens tested by PCR (Table 1). The median time from PCR positivity to the 2nd negative swab was 32.5 days (range 11-53 days). None of these HCW received any specific antiviral / immunomodulatory treatment.

Currently, our understanding of the viral kinetics in COVID-19 infection is incomplete. Pharyngeal viral shedding is very high early in the course of illness (3) and may be prolonged (4). However, nucleic acid detection cannot differentiate between infectious and non-infectious virus. In a study of 9 patients with mild COVID-19 illness, SARS-CoV-2 was not recoverable by culture after day 8 of illness despite high viral loads by PCR (3). In another contact tracing study, there were no secondary cases in the group that was exposed after 6 days (5). These findings suggest that infectivity and transmissibility is low after the initial illness.

In Australia, although there is allowance for return to work after DoH discussions in HCW with prolonged PCR positivity, this is predicated on “rounds” of testing in what is assumed to be a “small proportion of people” (1, 2). Culture for viable virus is not readily available. The findings in our cohort indicate that persistent positivity is the norm and is in line with international studies (4). Current guidelines for HCW return to work appear conservative, with significant workforce implications if outbreaks were to occur in healthcare settings. Further studies are urgently required to determine the infectivity in patients with prolonged SARS-CoV-2 viral shedding to find a balance in policy that benefits HCW, hospitals and patients.

Table 1: Healthcare workers with mild COVID-19 infection

Patient number (age, gender)	Duration of symptoms	Number of swabs collected after the 1st positive swab	Days between the 1st PCR positive swab to the 2nd negative of two consecutive negative swabs
1 (62, M) ⁺	10 days	5	42 days
2 (20, F)	5 days	5	34 days
3 (24, F)	1 day	5	32 days
4 (32, F)	Patient asymptomatic	5	33 days
5 (56, M)	23 days	3	NA#
6 (26, F)	8 days	6	43 days
7 (62, F) [*]	28 days	7	53 days
8 (50, F)	12 days	2	11 days
9 (35, F)	11 days	2	13 days
10 (52, F) [^]	14 days	3	21 days
11 (55, F)	Unable to ascertain	2	23 days

All patients with COVID-19 infection assessed and managed at the Austin hospital were prospectively included in a clinical database approved by the Austin Health Research Committee (database reference number CD 20002).

Co-morbidities: ⁺asthma; ^{*}hypertension; [^]rheumatoid arthritis.

The last collected specimen from patient 5 was PCR positive 11 days after initial positive specimen. The nucleic acid detection assay used was the AusDiagnostics Coronavirus Typing (8-well) assay. This is a multiplex-tandem polymerase chain reaction that employs two rounds of amplification. The cycle take-off value (Ct) for the last positive specimen on this patient was 23 cycles in the 2nd round of amplification.

Key: M, male; F, female; NA, not applicable; PCR, polymerase chain reaction.

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