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Evidence on Covid-19 and dialysis: *How many diagnostic tests for Covid-19 need to be carried out in dialysis patients who seem to have recovered?*

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This report summarises the evidence on Covid-19 and dialysis services. The specific aim of this work is to identify how many diagnostic tests for Covid-19 need to be conducted in dialysis patients who seem to have recovered.

Key findings

- There is still very little evidence on this topic
- Evidence suggest that patients may carry the virus 5 to 13 days after the symptoms disappear
- Three studies conducted with dialysis patient in Italy, USA and China recommend different types of recovery confirmation (negative test) for patients to return to regular dialysis. The most exhaustive confirmation process was proposed by the study conducted in China (Wuhan), which included two negative SARS-CoV-2 nucleic acid, negative SARS-CoV-2 antibody, and improvements in chest CT
- Guidelines and research papers are being regularly updated and may report new useful information about Covid-19 and dialysis services in the coming weeks

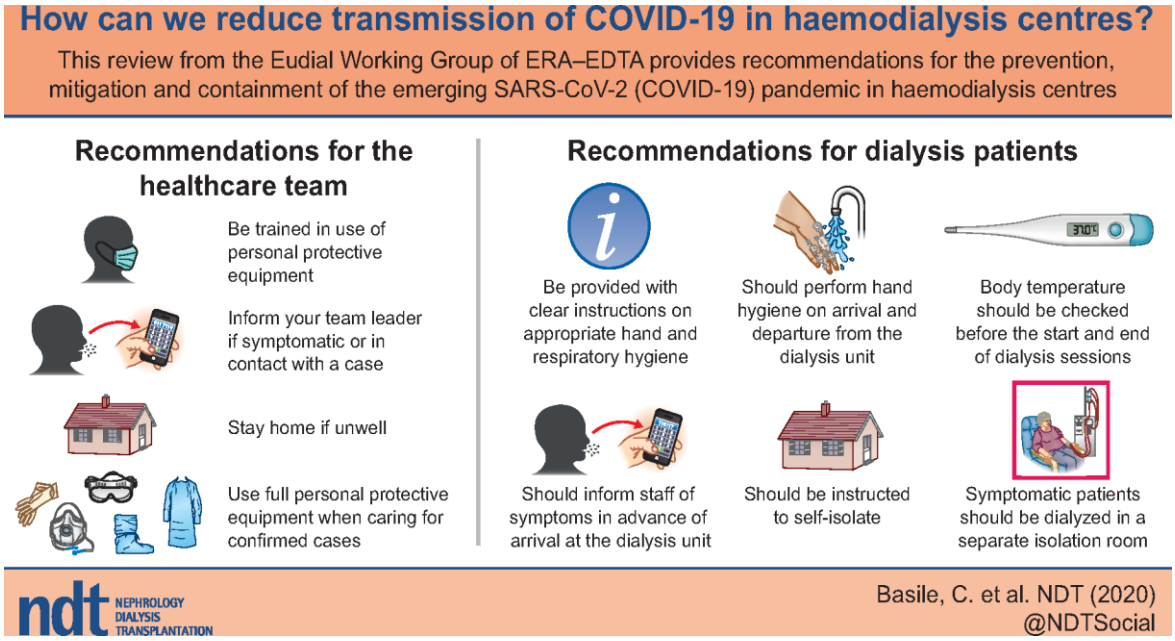
The evidence - background

As part of the research aimed at responding the Covid-19 challenges, several guidelines about the impact of Covid-19 on dialysis services have been published. In the UK, NICE has developed a guideline to promote patient safety and prevent staff from infection in dialysis service delivery (NICE, 2020). The document provides recommendations for communication, patients known, not known, or suspected to have Covid-19, healthcare workers, transport, planning, staff workload and dialysis provision. Similarly, CDC has published a document presenting recommendations for preventing infections in Outpatient Hemodialysis Facilities (CDC, 2020). Their main recommendations are based on the early recognition and isolation of individuals with respiratory infection, patient placement in terms of isolation and keeping a distance of 6 feet, and personal protective equipment.

The Italian Society of Nephrology has presented their recommendations about the identification and isolation of patients with Covid-19, and organizational and staff-related indications for dialysis. Their recommendations emphasise that dialysis facilities may develop an action plan adapted to the patients' specific needs. A guideline published by the Spanish Society of Nephrology provides similar recommendations for management, prevention and control of Covid-19. It covers different areas such as patient and staff protection, transport, management of patients with suspected or confirmed Covid-19 and space utilization in dialysis facilities.

Furthermore, other researchers have published their initial works in peer-reviewed journals. The European Dialysis (EUDIAL) Working Group of ERA-EDTA has recently published a paper (Basile et al., 2020) to provide recommendations for the prevention, mitigation and containment in haemodialysis centres of the emerging COVID-19 pandemic (Figure 1). Likewise, Kliger and Silberzweig (2020) and Arenas et al. (2020), provided specific recommendations for dialysis facilities in the USA and Spain respectively.

Figure 1. Summary of ERA-EDTA recommendations (Basile et al., 2020)



Ma et al. (2020) published the first study with hemodialysis patients with Covid-19. The authors concluded that HD patients with COVID-19 are mostly clinical mild and unlikely progress to severe pneumonia due to the impaired cellular immune function and incapability of mounting cytokines storm. More attention should be paid to prevent cardiovascular events, which may be the collateral impacts of COVID-19 epidemic on HD patients. Nevertheless, this study has some methodological flaws; the paper is a preprint and has not been peer-reviewed.

How many diagnostic tests for Covid-19 need to be carried out in dialysis patients who seem to have recovered?

Dialysis-related research

There are still very few published papers about Covid-19 and diagnostic tests in dialysis patients. Health professionals published a paper which aimed to share experiences in prevention and management of Covid-19 in ambulatory dialysis patients in Lombardy, Italy (Rombola et al., 2020). In

relation to the specific question of our report, authors recommended that recovery from SARS-CoV-2 infection needs to be certified using the current standards. However, if the outcome of the swab is negative, they suggested patients could return to the dialysis facility.

One study conducted by health professionals treating dialysis patients in Wuhan showed the strategies taken for prevention and control of COVID-19 in dialysis centers (Li & Xu, 2020). Authors presented several case scenarios for dialysis patients with suspected or confirmed Covid-19 infection (figure 2). In infected patients, they suggested a re-examination was conducted at least twice for SARS-CoV-2 nucleic acid, detection of SARS-CoV-2 antibody, and chest CT after 7–14 days. If the re-examined patients showed negative nucleic acid, negative antibody, and improved pulmonary imaging, radiology and respiratory experts were consulted to exclude the diagnosis of COVID-19. The deisolation was done after 14 days of dialysis in isolation zone, and these patients went back to the normal dialysis process.

In the USA, health professionals working in dialysis facilities in Washington described the screening process either for patients or for staff with suspected or confirmed Covid-19 (Watnick & McNamara, 2020). They reported that they have not followed CDC recommendations to allow staff back to work with two tests negative for COVID-19 24 hours apart, given the limited testing capacity.

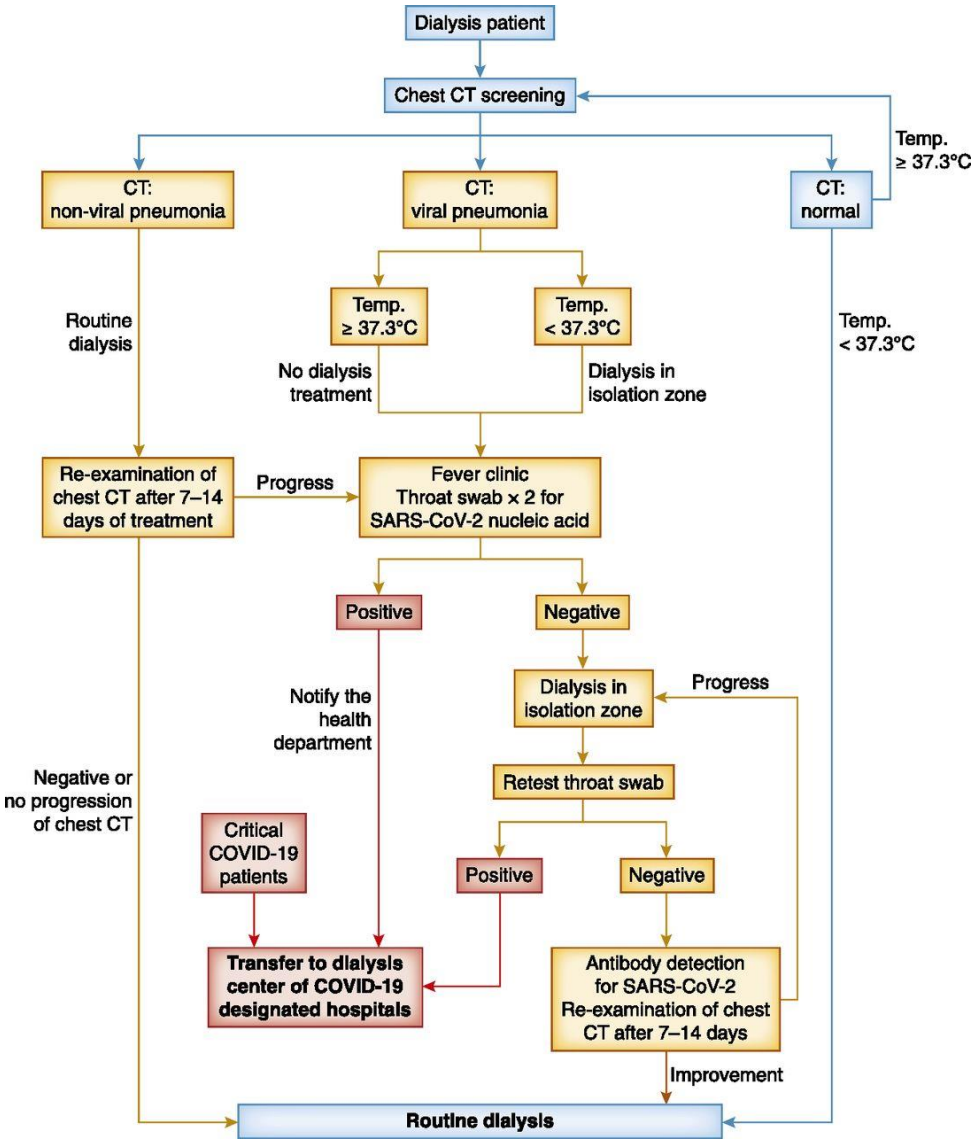
Li & Xu (2020) and Watnick & McNamara (2020) have not reported the sample sizes of their studies yet.

Non dialysis-related research

According to one small study (Lan et al., 2020), current criteria for hospital release should be re-evaluated after four clinicians with COVID-19 who met criteria for hospital discharge or discontinuation of quarantine in China (absence of clinical symptoms and radiological abnormalities and 2 negative RT-PCR test results) had positive RT-PCR test results 5 to 13 days later. These findings suggest that at least a proportion of recovered patients still may be virus carriers. This aligned with new studies that showed that viral shedding outlasts the end of symptoms (Wolfel et al., 2020).

Another study aimed to provide recommendations for long-term care facilities (Dosa, Jump, LaPlante, & Gravenstein, 2020). They recognize that there is little evidence on the topic. However, they report that previous experiences with SARS and MERS suggests that viral shedding may continue for at least 12 days following symptom onset, with the quantity of virus decreasing as symptoms improve.

Figure 2. Screening process in hemodialysis patients (Li & Xu, 2020)



Conclusions

There is a lack of explicit evidence on how many diagnostic tests for Covid-19 need to be conducted in dialysis patients who seem to have recovered. However, a paper sharing experiences with ambulatory dialysis patients in Lombardy, Italy; suggests that given the complications associated to dialysis, recovery after SARS-CoV-2 infection needs to be certified. But if the outcome of the swab test is negative, authors suggest the patients can return to the dialysis facility. Another study reporting experiences in dialysis centres in Wuhan, provided a more exhaustive criteria for readmitting patient in regular dialysis such as at least twice negative SARS-CoV-2 nucleic acid, negative SARS-CoV-2 antibody, and improvements in chest CT.

Additionally, there are different sources of evidence, which are being regularly updated and report useful information about Covid-19 and dialysis services.

There is one study not conducted with dialysis patients, which also report useful information. It was conducted in China with 4 patients and suggests that recovered patients may still carry the virus 5 to 13 days post-infection.

There are some limitations to this review. For instance, there are very few empirical data on Covid-19 and dialysis, and there is therefore a lack of literature around this topic. In addition, the methodological quality of the published studies is low as many of them are still works in progress.

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