

Editorial

Pre-operative SARS-CoV-2 testing, isolation, vaccination and remote prehabilitation – the road to ‘COVID-19 secure’ elective surgery

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Accepted: 30 August 2021

Keywords: COVID-19; isolation; observational; postoperative pulmonary complications

This editorial accompanies an article by the COVIDSurg and GlobalSurg collaboratives. *Anaesthesia* 2021; **76**: 1454–64.

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Since the beginning of the COVID-19 pandemic, healthcare institutions have implemented measures aimed at reducing the risk of nosocomial SARS-CoV-2 transmission, as well as the risk of operating on infected patients. With limited available evidence and the pandemic escalating, many practices were founded on a principle of precaution, which was entirely appropriate [1]. Robust evidence emerged on the scale of nosocomial transmission and the peri-operative risks of undertaking planned surgery in recently infected patients [2, 3]. Although there was a paucity of evidence assessing the balance of risks and benefits associated with pre-operative isolation, it aims to keep systems clean and patients safe.

This month in *Anaesthesia*, 15,025 authors have collaborated as part of the global COVIDSurg and GlobalSurg initiatives to collect prospective data on 96,454 patients from over 1600 hospitals across 114 countries [4]. Following adjustment for various measured confounders, patients who isolated had a 20% increased risk of post-operative pulmonary complications and this risk increased with longer periods of isolation. The risk climbed to 31% more in those isolating ≥ 8 days, which is still shorter than

recommendations in England for certain patient groups. The question is, can these new data be used to update guidelines and improve clinical practice? First, we must look to the methods used and then dive back into our recent pre-pandemic history when concepts such as prehabilitation and enhanced recovery dominated the peri-operative landscape and promised much for the future.

Go together, go further

This was a planned sub-study of a previously reported prospective cohort study [2]. The COVIDSurg and GlobalSurg collaboratives must again be congratulated on building the infrastructure required not only to execute the project and collect focused data on so many patients, but on setting out to provide rapid answers to important unknowns during a pandemic. They have provided the strongest data to date addressing the effect of isolation on postoperative pulmonary complications, and collaboration on this scale provides a blueprint for the future of peri-operative research. But there are limitations.

In an ideal world, one would randomly allocate patients to isolation or control before surgery for a defined period

and with strict adherence, or even enrol every elective surgical patient in the UK into an adaptive platform trial [5]. Neither of these options have been explored and this new contribution represents the best available evidence. However, there are important reasons why we should interpret the findings with caution. Those patients testing positive before postponed surgery were excluded and knowledge of this would have better estimated the benefits of isolation. Isolation as an intervention is complex because it is a spectrum of individual actions and precautions – perhaps more than a simple dichotomy and with variable adherence. Beyond this, there are limited descriptions of anaesthetic technique [6] and the controversy around how best to express and compare postoperative pulmonary complications remains [7]. The impact of isolation on other domains would have been of interest, such as: physical activity; smoking and alcohol use; weight gain; and psychological sequelae. This may have helped explain the higher corrected postoperative pulmonary complication rates seen in those who isolated. Other outcomes such as ‘days alive and at home’ (DAH₃₀, DAH₉₀) would be helpful too. However, this all soon begins to change a service evaluation into research, which, given the scale of the project as well as the speed at which it was necessary to deliver, would have significant time and resource implications.

Benefits of pre-operative isolation

Isolation before surgery was introduced without an evidence base and there has been almost no research on its risks and benefits. Only 26,948 (27.9%) patients isolated, which is surprisingly low. There are various associations reported and those who isolated were not simply older, higher risk patients undergoing more major procedures with general anaesthesia. This explains why the effect described is reliant upon correction for various measured confounders, with the uncorrected postoperative pulmonary complication rate similar in both groups. Some variables, such as the period of isolation and age, have been converted from continuous to ordinal data, which has well-described disadvantages [8]. It is difficult to see any benefits of pre-operative isolation from this analysis, both for patients and hospitals and even in areas of high SARS-CoV-2 community prevalence or when testing and COVID-19-free surgical pathways are in use. An alternative explanation is that the study was not designed to detect these benefits, as it is not possible to determine, for example, how many cases of nosocomial transmission were prevented.

Unintended consequences

Patient optimisation before surgery aims to get patients into the best possible position before surgery in order to at once improve patient outcomes, public health and increase the efficiency of healthcare [9]. Now, the gap between what we know about prehabilitation and enhanced recovery and how we implement their principles has never been wider, with COVID-19 having completely disordered progress towards streamlined re-engineered prehabilitation pathways [10]. There are three factors lending support to isolation alone being far from the main culprit in a new age of ‘reverse prehabilitation’.

First, many might be unpersuaded that an independent association between a short period of isolation and the incidence of postoperative pulmonary complications is biologically plausible [11]. Second, those who isolated may have also shielded before isolation. Little is known yet about the sequelae of shielding and its effect on intra- and postoperative complications, but an association here is perhaps more plausible. Third, optimising comorbidities requires access to relevant clinics, yet many of these services have been pressured during the pandemic due to staff shortages. Those who isolated may have also had less access to these services. They might have also isolated if it was easier for them to do so, and those less likely to be going outside might be frailer and at higher risk for postoperative pulmonary complications. Therefore, the effect seen here might not be explained by the relatively short period of isolation before surgery, with subtle unmeasured confounders almost certainly at play. What does seem reasonable is the need now to think about how to implement prehabilitation into COVID-19 surgical pathways. Bringing all pre-operative patients to hospital in person to optimise their physical and mental condition before surgery is no longer feasible.

A pragmatic way forward

Any strategy to mitigate the risk of COVID-19-associated complications must be patient and organisation specific. The new evidence provided here generates an interesting hypothesis yet does not allow complete relaxation of all isolation practices for all patients. At best, it asks questions of the need to isolate patients for the full 14 days as compared with 3 days, especially in combination with pre-operative SARS-CoV-2 testing and vaccination [12, 13]. This will provide flexibility as we strive to clear the backlog of operations that have been cancelled due to the pandemic [14, 15]. For patients who isolate, there must be renewed focus on home prehabilitation. Three days

isolation following a SARS-CoV-2 polymerase chain reaction swab test for all patients seems a pragmatic place to start, but organisations may struggle to balance the harms of isolation against the need for precaution. They will want to ensure absolutely everything possible is done, and patients will continue to take on some of that burden in exchange for surgery.

Requests for long periods of isolation to prevent nosocomial transmission will become more problematic when there is a signal that it causes harm for no benefit. Enforcing and adherence to isolation is also increasingly impractical. Moreover, nosocomial transmission is a hospital-related problem, and organisations must think about other areas where gains can be made, such as: mandating the use of airborne precautions for those caring for COVID-19 patients on wards; rethinking practices around ‘aerosol-generating procedures’ in patients who do not have COVID-19 [16]; and ensuring adequate ventilation in all indoor spaces. Offering elective surgery to a patient who has refused a vaccine, where it is free and available, will continue to present a moral dilemma for many. So too now is working out where to draw the line between benefit and harm for pre-operative isolation.

Acknowledgements

MC is an Editor of *Anaesthesia*. No other competing interests declared.

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