

# COVID-19: planning for the aftermath to manage the aftershocks

Australia has managed the crisis well so far but we should now also plan for future waves and the recovery phase

**C**oronavirus disease 2019 (COVID-19) pandemic management is focused on prevention, case finding and survival. Australia and New Zealand have done well and the numbers in our intensive care units (ICUs) are currently manageable.

Our subacute sector is presently able to deal with patients requiring rehabilitation. However, rehabilitation needs following COVID-19 are broad, complex and include cognitive, motor and respiratory sequelae to the infection, acute respiratory distress syndrome, and the thromboembolic response.

Planning and anticipatory action has been Australia's strength so far. In the same vein, an active planning approach is now required for the post-acute and rehabilitation response. This pandemic will inevitably have its waves, and will continue to threaten until a vaccine is rolled out. Not having a plan for possible surges is unconscionable, particularly when the consequences of the relaxation of restrictions are unknown.

Currently, Australian numbers are at a trickle; however, the challenge has been front and centre in countries such as Italy,<sup>1</sup> Spain, the United Kingdom and North America.<sup>2</sup>

In Wuhan, China, 36% of those with severe COVID-19 had neurological complications such as stroke, critical care neuropathy, and the complications of prolonged bed rest (eg, venous thromboembolism, disseminated intravascular coagulation, acute kidney injury, delirium anxiety, post-traumatic stress disorder).<sup>3</sup> In Italy, rehabilitation physicians have been treating post-extubation dysphagia, impaired mobility, critical care myopathy and neurocognitive losses,<sup>1</sup> while the British Society of Rehabilitation Medicine has established a framework of partnership with acute services to improve patient flow, outcomes and access to ventilators.<sup>4</sup>

In the United States, hospitals have had to rapidly transition acute patients to rehabilitation hospitals. In New Orleans, a 1000 bed post-acute hospital was dedicated to post-COVID-19 disability, with rehabilitation teams treating patients battling persistent hypoxia, stroke and mental illness.<sup>5</sup>

The majority of patients who are ventilated for more than 7 days suffer complications that require rehabilitation, 60% are unable to walk, and 17% die within a year.<sup>7</sup> One-third suffer neurological complications, many require inpatient rehabilitation for over 3 weeks, and some take over 150 days to regain their capacity to walk independently.<sup>8</sup> Others with stroke or cardiac complications of COVID-19 will require rehabilitation for up to 6 weeks, with some requiring lifelong support.



Australia needs to plan now, not just for survivors in the initial post-acute stage, but also to manage individuals affected in subsequent waves. Such patients may require rehabilitation, along with those, fearful of infection, who present to hospital late with non-COVID-19 conditions like stroke, and those with deteriorating chronic diseases who have not had access to hospital based services. That means not only estimating the patient population but also ensuring that subacute health workers have sufficient access to personal protective equipment, staffing and training.

In the Australian Government's emergency response plan,<sup>9</sup> the recovery phase devolves to the states, but there is no mention of the post-acute phase. In April, the New South Wales Ministry of Health established a rehabilitation community of practice to advise it. This follows international experience, as the International Society of Physical and Rehabilitation Medicine's disaster committee lead, Australia's Fary Khan states: "early rehabilitation reduces disability and improves clinical outcomes".<sup>10</sup>

Currently, many rehabilitation units are not prepared. Inpatient rehabilitation units (public and private) are almost always working to capacity. COVID-19 patients will be expected to be accommodated in addition to usual patients (eg, strokes, spinal injuries, amputations).

The NSW Rehabilitation Community of Practice has developed a staged COVID-19 escalation plan,<sup>11</sup> but the plans turn on one integral point — contagion.

When COVID-19 survivors come to rehabilitation wards will they no longer be infected? While a national statement exists,<sup>12</sup> local de-isolation protocols are yet to be implemented or updated in many hospitals and local health districts. Many people with severe COVID-19 have positive nasal swabs for up to 37 days<sup>13</sup> but are not considered infectious once 10 days have elapsed from after first symptoms. Attention to this timetable is critical should we need to make ICU beds readily available by shifting patients to rehabilitation. In some US rehabilitation hospitals, patients are

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assumed to always be infectious, which has a significant impact on personal protective equipment usage.

To ensure de-isolation, moderate and severe COVID-19 patients transferring to rehabilitation must have negative swabs on 2 consecutive days, be symptom-free for 2–3 days and be at least 10 days from symptom onset. In NSW, these criteria are currently being put in place and such a protocol will require discussion, review of the evidence, and leadership to execute.

Once we have a de-isolation protocol, we can confidently activate a staged escalation plan.

While our ICUs are coping with current numbers, our subacute sector has been managing with innovative models of care, such as mobile rehabilitation teams.<sup>14</sup> The NSW Rehabilitation Community of Practice's COVID-19 response principles<sup>11</sup> refer to mobile rehabilitation teams, variously called ART (acute care rehabilitation team) or SMART (specialist management with acute rehabilitation treatment) teams. They provide rehabilitation and discharge planning services to patients in the acute hospitals. It is a parallel care model in partnership with acute care that has been successful in decreasing length of stay and facilitating early discharge or transfer to inpatient rehabilitation facilities. These teams have discharged almost 50% of their patients directly home, avoiding inpatient rehabilitation admissions, and have been active in many NSW hospitals since 2009. Once home, tele-rehabilitation physician consultations, supported by community-based allied health practitioners, can be delivered, although additional resources are still being sought. Similar models exist or are under development in other jurisdictions as well.

In the event that our acute hospitals start to face challenges in accommodating those needing COVID-19 or ICU beds, the subacute sector will need to escalate to the next stage to create access. Options include decanting non-COVID-19 patients to the private sector,

increasing resources to acute or mobile rehabilitation teams, scaled up tele-rehabilitation services, and preparation for public hospital rehabilitation inpatient units to manage COVID-19 patients.

However, in order to decant to the private sector we need completed agreements with private hospitals, as flagged on 31 March by the Minister of Health.<sup>15</sup> Many private hospitals have facilities that are well suited for rehabilitation patients. This would require delineating private hospitals as COVID-19-free facilities and would be dependent on appropriate triage and testing facilities.

Managing the logistics will be a challenge in the subacute sector, particularly if planning is left as an afterthought. The efficient flow of disabled COVID-19 patients from acute to rehabilitation care will likely produce better patient outcomes and improve safety. Egress from acute hospitals means access to intensive care and ventilation for the community.

If Australia and New Zealand's success at flattening the curve continues, our existing subacute sector will manage. If not, mobile rehabilitation teams will need to be expanded, systems for patient flow to the private sector will need to be operational, and enhanced tele-rehabilitation services will need to be working. This will require the same vision and leadership that made our acute COVID-19 response world leading, collaborative and publicly supported.

In the UK and the US, we see the brutality of this pandemic, with mass burials and the tragic toll on health care workers. Australia and New Zealand have avoided this so far, but it is because we have planned well. We now need to prepare for the recovery phase because surviving may not be the same as living.

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