



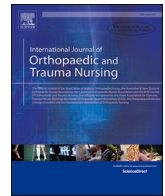
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Editorial

The musculoskeletal implications of deconditioning in older adults during and following COVID-19



During the COVID-19 pandemic many challenges have been faced by us all, but particularly by older citizens. Due to depleted physiological reserves, older adults are less able to resist infection and its effects and are more vulnerable to adverse outcomes, including death, when infection takes hold. This was evident in many communities during the first few months of the pandemic when death rates in older populations were devastatingly high, particularly for those who were already frail, those living in residential care settings and those admitted to hospital with medical conditions and other emergencies.

Prior to the mass vaccination of the global population against the COVID-19 virus, life for older people in most communities changed significantly in the first few months of the pandemic. Efforts were made to protect them from being infected with the virus, and becoming seriously ill or dying, by isolating them from those in their communities who might infect them. This resulted in two main negative effects: 1) older people no longer felt safe leaving their homes and moving around in their communities and, 2) those who usually visited and supported them at home could no longer do so in a way that was meaningful. This has led to significantly reduced social interaction. Many older people became socially isolated from family, friends, and community support agencies and, therefore, have been at greater risk of loneliness and depression.

While there are many serious implications of this situation, of significant interest to orthopaedic practitioners is the physical and functional impact of reduced mobility brought about by isolation from the wider community. Older people have been discouraged from leaving their homes, even for exercise, and many began to fear doing so. Such anxiety can lead to fear of falling and further restriction of activity. For many older citizens, especially in lower income countries where vaccination programmes have been slower, this is how the situation remains – largely confined to the relative safety of home.

One central tenet of orthopaedic care is that musculoskeletal immobility, or reduced mobility, is bad news. Following a period of inactivity (for example; during ill health, following injury, surgery, or hospitalisation or due to an inactive lifestyle) the human body is subjected to negative physiological processes that result in loss of function sometimes termed 'disuse syndrome'. Inactivity and reduced activity have an impact on all body systems, including the musculoskeletal, cardiovascular, and respiratory systems, cognition, and the skin. The effects of prolonged immobility include muscle myopathy and atrophy, resulting in musculoskeletal deconditioning. A healthy musculoskeletal system requires the right balance of weight bearing and muscular activity for the cells of muscle and bone to maintain their structure. Without enough physical activity, skeletal muscles atrophy, reducing their strength and range of motion, leading to further reduced mobility.

During prolonged immobility individuals can lose up to 2% of their lean muscle body mass per day, resulting in poor balance and coordination, along with joint stiffness (Plapler et al., 2021). Bone mass (bone mineral density/BMD) is positively associated with physical activity. Weight bearing activity, such as walking, is central to maintaining and improving bone mineral density but social isolation due to restrictions during the pandemic has reduced this for many older people.

Weaker skeletal muscle and reduced bone density are significant factors in falls and fragility fractures. They are also elements of frailty – the progressive age-related decline in physiological function which leads to vulnerability to adverse health outcomes, loss of function, disability, or death especially when physiological systems are placed under stress such as during ill health and following injury. Sarcopenia, loss of muscle mass with ageing, is a component of frailty (Martin and Ranhoff 2021). Hence, it has been suggested that the reduction in activity in older people during the pandemic will have resulted in increased frailty rates and worsening frailty in older people because of life-style changes brought about by social isolation (Shinohara et al., 2020).

It is probably already too late to prevent the increase in frailty, sarcopenia, deconditioning and associated deterioration in mobility which has now led to increased risk of falls and fractures in older people across many communities. Even so, both preventive and rehabilitation measures are urgently needed to help older people to improve their lifestyles and regain the function that they may have lost during the pandemic. Orthopaedic and trauma practitioners need to be cognisant that older people who have fallen and become injured will also need extra support to regain their previous level of mobility following treatment and surgery, considering that their level of mobility may have reduced significantly during the first year or so of the pandemic. Those sustaining fractures under these circumstances are facing a double jeopardy of deconditioning related to isolating and then a subsequent injury.

In terms of community measures to tackle this problem, there is a need for community-led exercise programmes and support. This should not be left to older people and their informal carers to manage – it is the responsibility of community services with support of the voluntary sector. However, the influence of orthopaedic and trauma clinicians is limited in community settings in most parts of the world. For hospital orthopaedic and trauma practitioners there are several important aspects of both pre- and post-operative care that should be carefully considered with musculoskeletal deconditioning in mind:

- It is essential that practitioners working with older patients who have sustained fractures undertake an assessment of frailty using a simple frailty assessment tool such as the FRAIL scale (Morley et al., 2012).

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This will ensure that the likely impact of frailty and associated sarcopenia can be mitigated by facilitating the involvement of a geriatric practitioner or nurse specialist to lead comprehensive geriatric assessment (CGA) and development of a treatment plan that involves appropriate exercise interventions and other measures to prevent and improve deconditioning.

- Deconditioning also needs to be considered as part of prehabilitation prior to elective surgery, considering behavioural and lifestyle risk factors that may result in poorer elective surgery outcomes (Milder et al., 2018). For older patients who will undergo planned/elective/ambulatory orthopaedic surgery, frailty assessment in the pre-operative period through effective pre-operative assessment is also essential. This will identify those at risk of adverse post-operative outcomes due to frailty and associated mobility problems as well as deconditioning due to isolation. This may mean that support must be offered preoperatively, particularly in the form of referrals for exercise to improve mobility and function prior to scheduling surgery.
- Practitioners also need to bear in mind the impact of deconditioning on post-operative recovery and rehabilitation, and its impact on the ability of patients to engage with post-operative rehabilitation. The rehabilitation process may need different strategies and acceptance that a slower pathway to rehabilitation that involves remedial exercise may be necessary.

It is important to recognise that interdisciplinary working is essential in all these processes. The level of engagement in exercise required to reverse deconditioning in older people hospitalised for orthopaedic injury or elective surgery cannot be left to the physiotherapy team alone. It needs a team approach that means that other practitioners such as nurses are deeply involved in the encouragement, support and maintenance of exercise as part of the general trajectory of care during the full

24-h period.

Deconditioning due to isolation is likely to be an ongoing problem for years to come. However, it also has the potential to change clinical practice in a way that will benefit every older person receiving orthopaedic and trauma care. Recognising the imperative of preventing and managing deconditioning, whatever the cause and even when the current pandemic has largely passed, could be a catalyst for positive change in practice. This will involve all practitioners learning much more about the importance of exercise in outcomes following injury as well as teach them skills in delivering exercise interventions as part of everyday practice.

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Julie Santy-Tomlinson

E-mail address: juliesanty@tomlinson15.karoo.co.uk.