

Mobilisation of patients recovering from COVID

Patients that have been admitted to the ICU, due to serious COVID complications, require effective strategies for early mobilisation and rehabilitation as they recover. **Mary Muir** and **Mark Pinder** offer an insight into best practice and the technologies that can assist, to ensure the best possible patient outcomes.

During the initial phases of the COVID-19 pandemic, the focus was on managing hospital admissions, expanding intensive care and ensuring that there was capacity to manage high acuity patients. With thousands hospitalised because of the pandemic, the role of early mobilisation and rehabilitation to aid patient recovery and advance care had never been more important¹ as patients exhibited signs of physical and psychological dysfunction,² which included severe physical impairments, deconditioning and muscle weakness.³ For example, it is recognised that excessive immobility has profound effects on key body systems during hospitalisation – lasting for months or years after discharge.⁴ Loss of muscle mass (up to 20% per week), and nerve dysfunction or damage leading to ICU acquired weakness appears to start within the first few days of critical illness.⁵⁻⁶ Muscle loss in the large lower extremity muscle groups will affect standing and walking ability.

Early mobilisation and rehabilitation requires a multidisciplinary team approach that considers the prevention of hospital-acquired conditions, increasing patient comfort, well-being and recovery from illness. Evidence shows that physical

and occupational therapy approaches are a fundamental component of the care pathway.⁷ The World Health Organization has called for a coordinated approach and investment to raise the profile of rehabilitation as a health strategy relevant to all people across their life and care continuum.⁸

It states that “rehabilitation is a set of interventions needed when a person is experiencing or is likely to experience limitations in everyday functioning due to ageing or a health condition, including chronic diseases or disorders, injuries or traumas.”⁹ Rehabilitation facilitates individuals to maintain or return to their prior level of functional independence, activities of daily living and aims to maximise their well-being without additional support or care.

Early and ongoing rehabilitation throughout the patient’s episode of care is critical to maintaining the flow in a care facility, aiming to safely discharge home, thereby, freeing up beds and capacity to treat more patients. As hospitals increase their activities, rehabilitation will be central to their operations to avoid costly hospitalisation, a reduction in length of stay and prevent re-admissions soon after

discharge from the acute setting.¹⁰

The increased physical demand placed on healthcare professionals is apparent in all care environments; availability of appropriate equipment based on individual need can help in the rehabilitation process, supporting caregivers to achieve successful clinical outcomes.

The Mobility Gallery¹¹ is an internationally recognised assessment and communication tool based on different levels of functional mobility; from mobile and independent; to fully dependent requiring all care as illustrated in Figure 1.

Clinicians recognise that undertaking a functional mobility assessment is central to ensuring patient safety, maximising the physical and cognitive performance. Stimulating mobility and ultimately respecting passivity is crucial from a quality of care perspective.¹²

In addition, the Positive Eight philosophy¹³ as illustrated in Figure 2 highlights the potential positive effects arising from maintaining or improving a person’s mobility by supporting care facilities with the right prerequisites:

- Use of the work environment to enable efficient care processes. ►



Figure 1.

- Provision of equipment to support patient mobility and reduce caregiver injury.
- Application of the best practice care skills.

Best practice guidelines recommend that safe patient handling and mobility technology can positively influence the quality of patient care, mobilisation, rehabilitation and activities of daily living.^{14,15}

Promoting the patient's functional mobility and making it possible to participate in activities of daily living can create a chain of positive effects that lead to their improved quality of life as well as reduced workload on the staff, thus creating better working conditions. In order for this chain of positive benefits to flow, the right environment, equipment, knowledge and skills are required to foster safe patient care.^{16,17} Therapeutic activities as part of a rehabilitation plan as illustrated in Figure 3 can challenge patients to mobilise earlier in the recovery process.¹⁸

In bed mobilisation

Where out of bed mobilisation is contra-indicated or options are limited, there are still methods for supporting early mobility and recovery based on the patient's clinical presentation.

Early rehabilitation interventions are generally graded and adopted in the daily routine within the bed space. Depending on the presentation and ability of the patient, daily passive and active movements (with and without gravity and against resistance) may be advocated to improve muscle tone and strength.¹⁹ Stretches may also be used to help maintain joint range of motion and muscle

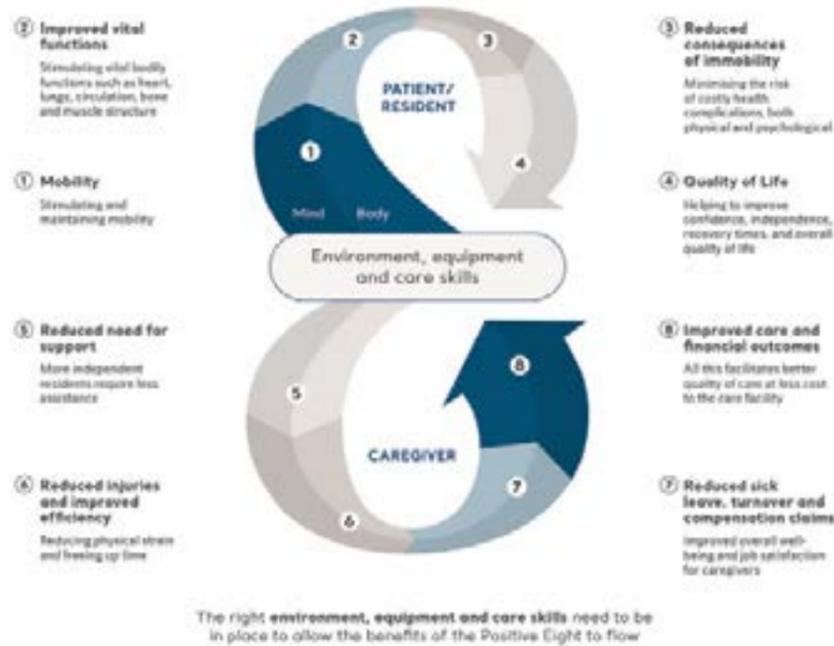


Figure 2.

length, prevent associated contractures and shortening of muscle groups.²⁰

Positioning

The use of postural positioning therapy (postural drainage) has been advocated for the management of respiratory conditions in critically ill patients.²¹ Regular repositioning can aid with lung secretion management and help to improve ventilation.²² Various seated upright positions, in bed with supportive aids, allows specific areas of the respiratory system to be isolated to help drain secretions

from one or more lung segments into the central airway where it can be removed actively or with manual physiotherapy techniques.²³

Alternate side lying positions also have a number of clinical benefits, aiding with postural drainage of pulmonary secretions improving respiration, with evidence to support reduced incidence of pneumonia and other respiratory challenges with regular positional changes and appropriate turn angles.²⁴

Alternatively, prone positioning can support the management of adult respiratory distress syndrome.²⁵ Prone positioning sessions in critical care, may require a patient to spend up to 16 hours out of every 24-hour period in the prone position.²⁶ Lengthy prone positioning sessions in critical care, are associated with an increased frequency of pressure ulcer development,²⁷ which could delay rehabilitation.

A continuation of respiratory rehabilitation may start with a gradual repositioning into upright sitting in bed, utilising the reverse Trendelenburg or cardiac chair position. While not as effective as sitting out in a chair, an upright-seated position in bed has a number of clinical benefits.²⁸ The change in position potentially allows the patient to orientate within their surroundings, providing a better position for communication, eating and drinking or functional activities.²⁹

As clinically appropriate, the patient can be progressed, using specialist equipment from a supine to standing position. This progressive verticalisation into a standing position provides additional benefits over the chair position by facilitating increased proprioceptive feedback through the load



bearing joints preventing or reducing the impact of immobilisation of bone demineralisation.³⁰

Upright positioning is often used, as an adjunct to therapy – regularly challenged sitting during the day³¹ – particularly useful for those patients where sitting out is more challenging or requires a high number of staff to facilitate the transfer out of bed. Evidence suggests that upright positioning can provide an orthostatic challenge to prevent cardiac function deterioration,³² postural hypotension, increase functional residual capacity,³³ neurological impairment³⁴ and a better position for active exercises and intervention within the clinical environment. An early method to support in bed rehabilitation is cycle ergometry, used during the acute phase of illness when out of bed mobility is contraindicated or as an adjunct to progressive mobility to improve strength and cardiorespiratory fitness.³⁵ Electrical muscle stimulation may also be utilised during acute periods of immobility, although at present the effectiveness of this remains inconclusive.³⁶

Pressure ulcer prevention

In order to assist the prevention of pressure ulcers developing over body areas such as the face, breast region, genitals, knees and toes when in a prone position, an appropriate pressure redistribution mattress should be used. Consideration could be given to a mattress, which allows carers to deflate individual mattress cells under the patient's body, providing an adaptable support surface and selective off-loading for the management of highly vulnerable areas.³⁷

Regular repositioning is essential to help prevent the development of pressure ulcers whenever patients are spending extended periods in bed due to excessive loading onto sensitive areas of skin with increased contact directly over bony prominences.^{38,39} Such injuries can lead to a protracted hospital stay, patient suffering, possible surgical intervention, and increased costs of care.⁴⁰

To further support the care of patients in bed, early detection⁴¹ using a specialised scanner can assist clinicians to identify anatomical areas at increased risk of pressure ulcers developing five days earlier than visual inspection alone and potentially reduces the incidence of hospital acquired pressure ulcers by an average of 89% based on an individual care pathway.⁴² Early



Figure 3.



detection provides an opportunity for timely intervention in the management of pressure ulcer prevention and the rehabilitation and recovery process.

VTE prevention

Another important area in the care of immobile patients is preventing venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE) which can lead to serious and potentially life changing complications, while increasing healthcare cost.

Venous stasis is naturally avoided through the biomechanical action of the calf and foot muscle pump, which is why early ambulation / mobilisation is the treatment of choice for patients at lower risk of VTE.⁴³ When walking is not possible, the benefits of the muscle pump can be simulated by mechanical means. Prevention strategies commonly incorporate the use of pharmacological prophylaxis and/or mechanical methods⁴⁴ including intermittent pneumatic compression and passive graduated compression stockings.

Sitting on the edge of the bed

The process of sitting a patient on the edge of the bed forms an important part of the

patient assessment and subsequent provision of a structured rehabilitation programme and seating plan. The assessment would consider the body anthropometrics, shape, sitting balance and readiness for sitting out of bed, ensuring the bed height is adjusted so the person's feet are placed on the floor providing proprioceptive feedback.

Out of bed mobilisation

Passive standing

The process of sitting on the edge of the bed can at times be labour intensive, particularly for patients who are obese, of low arousal or with profound ICU-AW.⁴⁵ In these instances, equipment such as a tilt table, ceiling lift / passive mobile hoist with an ambulation sling, or a multi-positional aid can support patient care in the acute care setting.

Evidence suggest that a multi-positional aid that can support supine, sitting or standing position, early in the rehabilitation process can have positive outcomes to patient care, length of stay and facility costs.⁴⁶

Active standing

Once the patient is able to maintain their sitting balance with minimal support and move their legs against gravity, they may be ready to ▶

progress to stand at the side of the bed.

Using a standing and raising aid is one potential solution for those patients aiming to achieve a full standing position and improve confidence following lengthy periods of immobility and illness. Active standing aids encourage the patient to participate with the transfer and standing process, supporting early standing activities, weight bearing exercises, standing practice and short distance transfers.

Seating

Evidence suggest that effective seating can help to reduce muscle atrophy, improve sitting balance, strength and conditioning with potential positive effects to improve patient flow.⁴⁷ The principles of good seating consider:

- Loading the body
 - maximising the contact with the seating surface can provide good proprioceptive feedback;
 - to achieve this the chair must be adjusted to the individuals body shape and weight distribution, ensuring the patients feet are on the footplate to prevent any neurological complications;
- Provide postural support
 - considering the armrest angle, ensuring the torso and head are supported effectively;
- Allow effective repositioning
 - by using the tilt in space 30-45° functionality;
 - off-loading anterior tilt to support standing, with a stand aid and 24-hour care;
- Appropriate surface / cushion
 - which supports immersion and envelopment in conjunction with a documented risk assessment regarding pressure ulcer prevention.

Walking

Once patients are sitting out more frequently,

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progression towards active exercises commences with a natural pathway leading to standing and ambulation. To support standing and ambulation, ceiling lifts with a walking sling or a mobile standing and raising aid can be used to support the patient and protect them from falls during stepping or walking practice.

Gradually, as muscle strength and stamina increase, levels of functional independence improves – having beneficial effects on the patient’s physical and psychological status, they can become more independent in undertaking activities of daily living.

Summary

In summary, during the patient’s recovery process, they can face a series of physical, psychological and cognitive health impairments, with effects on survival and physical functioning lasting potentially for years post-discharge. Evidence suggests that the benefits associated with early mobilisation and rehabilitation using the appropriate technologies, knowledge and skills can support the patient to be mobilised early, often and at a safe and optimal level of functioning, helping to improve outcomes, quality of life and maximise efficiencies.⁴⁸ CSJ

References for this article are available upon request.

About the authors



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