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Posters - Hall 1

THE USE OF INSPIRATORY MUSCLE STRENGTH TRAINING IN PATIENTS REQUIRING PROLONGED VENTILATION: EVALUATION OF PHYSICAL RECOVERY AND VENTILATOR WEANING OUTCOMES

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Background: Approximately 295,000 people are admitted to intensive care in the United Kingdom per year, most of these will require mechanical ventilation during their stay. Although mechanical ventilation is essential in the management of critically ill patients, it causes detrimental effects on the respiratory system, with accelerated muscle atrophy evident after just six days. Whole-body muscle wasting affects the muscles of inspiration and skeletal muscles, leading to prolonged weaning and intensive care acquired weakness, which negatively impact on length of stay and survival. Inspiratory muscle strength training has been shown to improve inspiratory muscle strength, but whether strength gains translate into improved clinical outcomes remains unclear.
Purpose: This service evaluation aimed to explore the impact of inspiratory muscle training on physical recovery and weaning when used in conjunction with early rehabilitation from the point of tracheostomisation to ventilator liberation.
Methods: A case series approach was adopted, which describes three participants and their clinical journeys from tracheosomisation to ventilator liberation. Inspiratory muscle training was offered twice daily, six days a week from the point of tracheostomisation until ventilator liberation. Whole-body rehabilitation was also provided.
Results: Participants carried out a total of 82 inspiratory muscle training and 38 rehabilitation sessions, with each training session reported to take around 20 minutes. No adverse events were recorded. Inspiratory muscle training was well tolerated, with 99% of initiated sessions being successfully completed. All participants improved in physical recovery outcomes (Chelsea Critical Care Physical Assessment - CPAx) and inspiratory training pressures during the period of ventilator weaning. Participants were successfully weaned from mechanical ventilation within six weeks. The shortest wean duration was seen in the participant that frequently elected to titrate inspiratory muscle training intensity above 50% of daily maximal inspiratory pressures. Correlations between inspiratory strength and physical recovery or ventilator free breathing time did not reach statistical significance.
Conclusion(s): Inspiratory muscle training is safe and feasible as part of a rehabilitation programme in tracheostomised patients undergoing weaning. With the time cost to delivering inspiratory muscle training, which may detriment time for

physical rehabilitation, further research is required to establish where clinical resources are best focussed to optimise patient outcomes and reduce the clinical burden of prolonged mechanical ventilation.
Implications: The physiotherapist's knowledge of respiratory pathophysiology, lung dynamics and principles of exercise training, can provide patients with known respiratory pump failure progressive training strategies to improve muscle strength and function leading to ventilator liberation and functional independence. The evidence to support the use of inspiratory muscle training to achieve these clinical milestones remains unclear. The number of physiological and psychological factors associated with successful weaning, aside from inspiratory muscle weakness, provide a challenge when demonstrating clear evidence in support of inspiratory muscle training. Provisional findings suggest that, in specific intensive care cohorts, inspiratory muscle training should be considered as an option within the physiotherapist's toolbox to complement rehabilitation as part of a ventilator weaning strategy.
Key-words: 1. Inspiratory muscle training 2. rehabilitation 3. intensive care acquired weakness
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Ethics approval: Did this work require ethics approval?: No
Institution: University College London
Ethics Committee: N/A
Please state the reasons why ethics approval was not required: This was a service evaluation, for which ethical approval was not required. This decision was confirmed by utilising the Health Research Authority (HRA) decision tool and in agreement with The Joint Research Office at University College London (UCL). The study was registered through the Clinical Effectiveness Team at Barts Health NHS Trust.

All authors, affiliations and abstracts have been published as submitted.