Commentary

Geographical cohorting of ICU patients to support rehabiliation and weaning from mechanical ventilation

Samuel Dean[1], Owen Gustafson[2]

[1] Acute Therapy Services, Sheffield Teaching Hospitals NHS Foundation Trust, [2] Therapies Clinical Service Unit, Oxford University Hospitals NHS Trust

https://doi.org/10.56792/INFH2900

Journal of the Association of Chartered Physiotherapists in Respiratory Care

INTRODUCTION

Among the many challenges faced by Intensive care unit (ICU) patients, prolonged mechanical ventilation (PMV) and ICU-acquired weakness (ICUAW) can complicate clinical management and extend recovery periods, necessitating specialised rehabilitation strategies. PMV refers to the need for mechanical ventilation for more than 21 days.[1] Despite only 5-10% of critically ill patients requiring PMV, they utilise approximately one-third of all available UK ICU bed days.[2]

ICUAW is characterised by significant muscle wasting and weakness that develops during an ICU stay with no other cause.[3] ICUAW worsens acute morbidity, increases healthcare related costs and 1-year mortality.[4] It is associated with PMV and is present in up to half of ICU patients.[1] Managing these patients is complex and resource-intensive, with a specialist structured approach to weaning from mechanical ventilation and rehabilitation required to improve outcomes.[5]

Rehabilitation and early mobilisation are potential therapeutic strategies to prevent the development of ICUAW.[6] The goal of rehabilitation is to mitigate the adverse effects of ICUAW and expedite recovery. However, implementing rehabilitation strategies in the ICU is challenging due to the heterogeneity of patient needs and the highly complex physical environment.

Geographical cohorting in the ICU for rehabilitation could be an innovative approach to address these challenges. Grouping patients with similar rehabilitation needs in specific areas of the ICU, can provide more focused and coordinated care. This model can potentially facilitate enhanced multidisciplinary team (MDT) collaboration, streamline care pathways, and use limited resources more efficiently. This commentary aims to explores the concept of geographical cohorting in the ICU for rehabilitation, examining its benefits, challenges, and implications for patient care.

POTENTIAL BENEFITS OF GEOGRAPHICAL COHORTING

Studies investigating geographical cohorting to date have been mainly undertaken in United states of America (USA) healthcare systems and not directly related to rehabilitation or weaning from mechanical ventilation.[7-10] The studies describe several aspects to how geographical cohorting can support healthcare systems including MDT collaboration, streamlined care pathways and improving patient outcomes.

The British Thoracic Society (BTS) and Intensive Care Society (ICS) paper on specialised weaning units (SWUs) provides valuable insights that support the concept of geographical cohorting for ICU patients undergoing rehabilitation. The model emphasises concentrated, specialised care, interdisciplinary collaboration, and continuous quality improvement. These elements are crucial for enhancing patient outcomes and operational efficiency in ICU rehabilitation settings.[2]

ENHANCED MULTIDISCIPLINARY COLLABORATION

Rehabilitation and weaning from PMV in the ICU is unpredictable and requires continual input from the MDT to tailor these processes.[11] Studies in the USA have found that geographical cohorting of patients improved time utilisation and care coordination.[10] Geographical cohorting has been associated with increased frequency of nurse-physician communication, and the proportion of time nurses spend on team rounds.[7]

IMPROVED CARE PATHWAYS

Concentrating patients with similar conditions in one area supports healthcare teams to streamline care pathways, allowing implementation of standardised protocols and rehabilitation plans. Kapoor et al.[10] demonstrated that geographical cohorting in patients reduced practice variation and enhanced team communication.

IMPROVED PATIENT OUTCOMES

Studies in the USA have shown that geographical cohorting can lead to improved patient outcomes, including reduced ICU length of stay (LOS) and lower rates of hospital-acquired infections.[7-10] Geographical cohorting in addition to MDT rounds and case management support, resulted in a 16-17% reduction in hospital LOS and a decrease in 30-day readmission rates.[8] Kapoor et al[10] evaluated geographical cohorting in a large ICU, with significant reductions in Hospital acquired infections and pressure ulcers.

EFFICIENT USE OF RESOURCES

Geographical cohorting allows for more efficient use of healthcare resources and improved workflow and reduced interruptions.[10] Through centralising care for patients with similar needs, ICU's can optimise staffing, equipment, reduce waste and improve overall efficiency. This is particularly important in the UK, where there is an emphasis on efficient use of ever decreasing resources.

CHALLENGES AND CONSIDERATIONS

IMPLEMENTATION BARRIERS

Implementing geographical cohorting in the ICU requires careful planning and organisation. Teams must consider the ICU's physical layout, including isolation rooms. Initial implementation can be resource-intensive and costly, posing challenges in the current UK healthcare system. Effective cohorting demands coordination across the MDT, which can be difficult in larger hospitals with complex structures. The system must be flexible and scalable to meet demands. Feedback mechanisms for staff and patients are essential for identifying improvements, and a culture of quality improvement is crucial for refining the system.

PATIENT SELECTION

Not all patients are suitable for geographical cohorting. Careful selection will be necessary to ensure that patients grouped together have similar rehabilitation needs. This requires robust criteria and regular assessment to avoid mismatches.[2] There is a risk that cohorting could lead to disparities in care if not managed properly. While cohorting focuses on grouping patients with similar needs, it is essential to maintain a patient-centred approach.

STAFF ADAPTATION

Healthcare providers need to adapt to new workflows and communication patterns. This requires ongoing training and support to ensure that staff are comfortable and effective within a new system. Staff should be adequately trained to work and support this new model, as there will be a shift in the care focus from acute ICU care to holistic rehabilitation, recovery and preparation for discharge. Staff may resist new systems, overcoming this resistance requires effective change management strategies.

CONCLUSION

Geographical cohorting in the ICU for rehabilitation presents a promising strategy for improving patient care and operational efficiency in the UK. While there are challenges to its implementation, the potential benefits in terms of enhanced collaboration, streamlined care pathways, and improved patient outcomes make it a worthwhile consideration for healthcare facilities aiming to optimise their ICU operations.

To the best of our knowledge this topic has not been considered in UK literature to support or refute the implementation of geographical cohorting in weaning from mechanical ventilation and rehabilitation in ICU. Although there are several studies showing the possible benefits of geographical cohorting on healthcare systems in the USA, it is difficult to generalise the findings. Healthcare systems, patient demographics, and resource availability can vary significantly, affecting the applicability of international studies to the UK context. At present, key stakeholders lack the evidence needed to make informed decisions about its implementation.

Although, the BTS/ICS paper on model for SWU's[2] in the UK is an interesting concept which could be useful to explore further on how this can support further research into geographical cohorting for rehabilitation and weaning from mechanical ventilation in the ICU.

The lack of existing research highlights an opportunity for funding bodies and researchers to explore this area. To address the gap in literature, there may be a need for small-scale single centre case studies within the UK. These initiatives could provide preliminary data and insights to inform a larger implementation study.

REFERENCES

1. Lone NI, Walsh TS. Prolonged mechanical ventilation in critically ill patients: epidemiology, outcomes and modelling the potential cost consequences of establishing a regional weaning unit. *Crit Care*. 2011;15:R102. doi:10.1186/cc10117

2. BTS/ICS Model of Care for Specialised Weaning Units. *British Thoracic Society Reports*. 2023;14(1). https://www.brit-thoracic.org.uk/delivery-of-care/specialised-weaning-units/

3. Vanhorebeek I, Latronico N, Van den Berghe G. ICU-acquired weakness. *Intensive Care Med*. 2020;46(4):637-653. doi:10.1007/s00134-020-05944-4

4. Ambrosino N, Vitacca M. The patient needing prolonged mechanical ventilation: a narrative review. *Multidiscip Respir Med*. 2018;13:6. doi:10.1186/s40248-018-0118-7

5. Mifsud Bonnici D, Sanctuary T, Warren A, et al. Prospective observational cohort study of patients with weaning failure admitted to a specialist weaning, rehabilitation and home mechanical ventilation centre. *BMJ Open*. 2016;6(3):e010025. doi:10.1136/bmjopen-2015-010025

6. Kayambu G, Boots R, Paratz J. Physical Therapy for the Critically Ill in the ICU: A Systematic Review and Meta-Analysis*. *Critical Care Medicine*. 2013;41(6):1543-1554. doi:10.1097/CCM.0b013e31827ca637

7. Bressman, et al. Geographical cohorting by clinical care team: a narrative review. *Annals of palliative care medicine*. 2023;4(12):855-862. doi:10.21037/apm-22-1400

8. Jolly GA, Platt A, Knutsen K, et al. Impact of geographical cohorting, multidisciplinary rounding and incremental case management support on hospital length of stay and readmission rates: a propensity weighted analysis. *BMJ Open Quality*. 2024;13:e002737. doi:10.1136/bmjoq-2023-002737

9. Klein AJ, Veet C, Lu A, et al. The Effect of Geographic Cohorting of Inpatient Teaching Services on Patient Outcomes and Resident Experience. *J GEN INTERN MED*. 2022;37:3325-3330. doi:10.1007/s11606-021-07387-z

10. Kapoor, et al. Impact of Geographical cohorting in the ICU: An Academic tertiary care centre experience. *Critical care explorations*. 2020;2:e0212. doi:10.1097/CCE.0000000000000212

11. *LIFE AFTER CRITICAL ILLNESS A Guide for Developing and Delivering Aftercare Services for Critically Ill Patients*. Faculty of Intensive Care Medicine; 2021.