SusQI project report

Project Title:	Date of Report:
Pioneering Early Mobilisation in a Cardiac Intensive Care (CICU) unit: a Sustainable Healthcare Initiative	Project completed in 2018 as part of the University Hospital Southampton Green Ward Competition.
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Background:

Patients in intensive care units become de-conditioned, with muscle wasting whilst sedated (critical care myopathy) resulting in increased length of stay (LOS), poor performance status post ICU stay and prolonged rehabilitation. There is evidence that 'early mobilisation' from 48 hours after admission to intensive care is well tolerated, helps reduce muscle wasting, is a powerful psychological motivator and shortens intensive care and hospital stay.

Prior to this project, patients on the Cardiac Intensive Care Unit (CICU) at Southampton Hospital would not receive routine physiotherapy; they would only be referred for physiotherapy if they had respiratory complications or difficulty with rehabilitation. Although early mobilisation is not a new concept to the intensive care at Southampton Hospital, the therapy team pioneered this service in the CICU setting.

Specific Aims:

To show that increasing therapy input alongside a strict sedation protocol would both reduce intensive care length of stay and improve functional outcomes for patients following discharge from CICU.

Methods:

The CICU team recruited a therapy technician, to work alongside a qualified physiotherapist, to help set up the project and ensure that the therapy sessions were delivered.
In preparation for running the project the therapy technician helped in:

- educating all CICU staff, including the use of the Motomed equipment required for exercising patients under sedation.
- developing the inclusion/exclusion criteria which included patients 24-96 hours after open heart surgery.
- setting up an electronic database for the project.
- developing questionnaires for patients and staff.

The therapy assistant systematically initiated mobilising patients who fitted the protocol criteria. These patients received 30 minutes of rehabilitation, twice a day, continuing until discharge from CICU. The staff selected the highest level of activity in which the patient could participate. For example: if the patient was intubated and ventilated the Motomed device was used for passive exercise; if the patient was awake then the options would include sitting on the edge of the bed, standing, marching on the spot, transferring from bed to chair and mobilising.

Measurements:

Data was gathered before and after the introduction of the early mobilization protocol on the number of days that patients received artificial ventilation, length of stay in intensive care, in cardiac high care (CHC) beds, on the ward and total hospital length of stay.

238 patients were recruited to the early mobilisation programme (EMP) over 24 months from the 20th January 2019 to the 30th January 2019.

Financial savings: Savings were calculated using the average number of bed days saved based on cost of bed days in 2017 (costs increased during the project). Costs for employing a therapy technician at £24,303 per annum were taken into account.

There were no capital costs in acquiring the Motomed; this was borrowed from general ITU.

Environmental savings: Emissions factors for high and low intensity bed days were used to calculate savings[1].

Results:

Clinical outcomes

The results showed that early mobilisation reduced ventilation days by a mean of 4 days and reduced cardiac intensive care stay by a mean of 6 days in patients after cardiac surgery. This effect was sustained at 12 months and 24 months of the programme. This suggests that the intervention may prevent deconditioning and critical care acquired weakness.

	Number of patients	Average Ventilation days per patient	ICU Length of stay (Days per patient)	Cardiac High Care & Ward Length of Stay (Days per patient)	Total Hospital Length of Stay (Days per patient)
Previous Audit Without Input	41	5.55	10.70	10.40	21.15
Current Trial 2017 20-01-17-17-01-2018	121	1.82	4.79	8.9	13.36
EMP Benefit 2017	N/A	(-) 3.73	(-) 5.91	(-) 1.5	(-) 7.79
Current Trial 2018	117	2.31	4.81	7.77	12.62
EMP Benefit 2018	N/A	(-) 3.34	(-) 5.89	(-) 2.63	(-) 8.53
Current Trial Mean of 2 years	119	(-) 3.54	(-) 5.9	(-) 2.06	(-) 8.16

Environmental sustainability

The carbon footprint of the number of days saved was an impressive 48.5tonnes CO2e. This is equivalent to the annual carbon footprint of almost 5 UK citizens and 18 return trips London from Sydney in economy class.

Social sustainability

The more rapid recovery will allow patients to have more autonomy during their hospital stay, which may improve the patients' sense of self-efficacy, a factor that is important for health and wellbeing. A more rapid recovery and shorter hospital stay may place less of a burden on relatives; since the quality of relationships is a key component of health and wellbeing this may lead to improved outcomes for the patients.

Disbenefit: The EMP was limited to CICU. The service raised expectations and a few patients felt disappointed and anxious with the reduced service when they were transferred to other settings. To help to communicate what therapy services would be offered throughout the patient journey, the therapy assistant had a discussion with all patients to explain the service and this conversation was reinforced with a patient information leaflet.

Economic sustainability:

Total savings amounted to £1,266,327.

Further cost savings could have been calculated from reduced equipment used, for example, patients being ventilated for a shorter time, patients being able to toilet and so catheters not being required, etc.

Barriers encountered:

Staff concerns: Nursing staff had concerns that exercise could have had an adverse effect on patients who were ventilated. To address these concerns the team ran staff education sessions and had many informal conversations explaining early mobilisation to build up confidence among the nursing team. This approach was effective in allaying staff concerns and in embedding the programme. The following quote from a member of staff demonstrates how attitudes on the unit have changed:

> *"EMP is very helpful and beneficial for our patients. I've seen a huge improvement in our patients' mobility, especially those who are bed bound for a long period of time. EMP staff are very approachable and professional. They are great asset to our Critical Care Team."*

There was little therapy input on CICU prior to the project: Key to the success of this project was recruiting someone who was not only technically excellent but also skilled in building trusting relationships. Greg Juraczyk was recruited as a highly motivated and skilled therapy assistant, who was passionate about the project. The skills and attributes that were essential to the success of the project included excellent clinical judgement in selecting patients for the programme, meticulous and methodical data collection, effective time management, an ability to build relationships with and to motivate both patients and staff sensitivity.

Conclusions:

This project has continued to be embedded with CICU. The team aspire to convert the therapy assistant role from a temporary position to a permanent role and expand the EMP from a 5-day to a 7-day service. Nursing staff currently help to deliver patients' rehabilitation during weekends, supported by multidisciplinary morning handovers, communication boards, exercise booklets and monthly education.

A cardiac surgical booklet is now issued to all EMP patients. The therapy team evaluate patient/staff feedback and data during monthly meetings. Agreed changes to this service occur at 3 monthly intervals.

The team would like to expand the EMP to cover the current cohort and more complex patients.

As the winning team for the Green Ward Competition, the team went on to apply for the 'Advancing Healthcare Awards', where they were nominated as runners up. Since this award their novel service improvement has been featured in the Bournemouth Daily Echo paper, BBC South Today TV news, on Twitter, Facebook and on the Chartered Society of Physiotherapy and University Hospital Southampton webpages.

References

1. Emissions factors taken from: *Care pathways guidance on appraising sustainability (Sustainable Development Unit, 2015) Available from: http://www.sduhealth.org.uk/areas-of-focus/carbon-hotspots/pharmaceuticals/cspm/sustainable-care-pathways-guidance.aspx*