

The Benefits of Early Rehabilitation on the Intensive Care Unit

1. Introduction

Skeletal muscle wastage and weakness are common features in survivors of critical illness. Research has identified 1.3-3% loss of muscle mass per day for patients on the intensive care unit (ICU). The most significant loss is within the first 10 days on ICU (Puthuchery et al, 2013). As a result there is emerging evidence demonstrating early rehabilitation of patients in ICU is safe, effective and beneficial (Herridge et al, 2011, Morris et al, 2012, Schweickert et al, 2009). Rehabilitation has been associated with a decrease in ICU and hospital length of stay, functional outcome & improved peripheral and respiratory muscle strength. The NICE guidelines CG83 : rehabilitation of the Critical Ill (2009) recommend using rehabilitation to assess and treat physical morbidity in ICU patients as early as possible. The Core standards for Intensive care units (2013) supports early rehab and recommend patients receive 45 minutes rehabilitation 5 days a week.

2. Audit Objective

The rehabilitation data compiled in 2013, 2014 and 2015 focused on an outcome audit rather than a process audit. The objective of the audit was to assess;

- The effects of increase rehabilitation on a patients length of stay on ICU
- The effects of increase rehabilitation on a patients hospital length of stay
- The functional outcome of delivering more rehabilitation to these patients
- Whether patients were receiving 45 minutes rehabilitation as per the ICU Core standards

3. Method and Sample

In accordance with the NICE guidelines CG83 (2009) and Core standards (2013), from March 2014 there has been a greater emphasis on rehabilitation on ICU. The physiotherapy team have used their expertise to engage patients as early as possible in rehabilitation, set patient orientated goals and plan individual exercise programmes. Rehabilitation has been characterised by a hierarchical progression of techniques from passive cycling, sitting over the edge of the bed, standing, sitting out of bed using the care-med chair, transferring to a normal armchair and walking.

With the overwhelming support of the consultants and nursing staff and a successful trial, motomed letto 2 machine was purchased to facilitate the rehabilitation of very dependent critically ill patient by allowing passive and active assisted cycling in bed.

The following data was collected from patients admitted to ITU during the month of March 2013, March 2014 and March 2015 using initially the paper notes in 2013 and then retrospectively using

CRS documentation in 2014 and 2015. The ICU/Surgical physiotherapy team collected and analysed the data.

Data Collected -

- I. Functional scores at baseline, on leaving ITU and leaving hospital using the Manchester Mobility Score.
 - 1- Bedbound
 - 2 – Sitting on edge of bed
 - 3 – Hoist into chair
 - 4- Standing practice
 - 5 – Transfers with assistance
 - 6 – Mobilises with/out aid
 - 7 – Mobilises >30 m

- II. Length of ITU and hospital stay for each patient who received rehabilitation

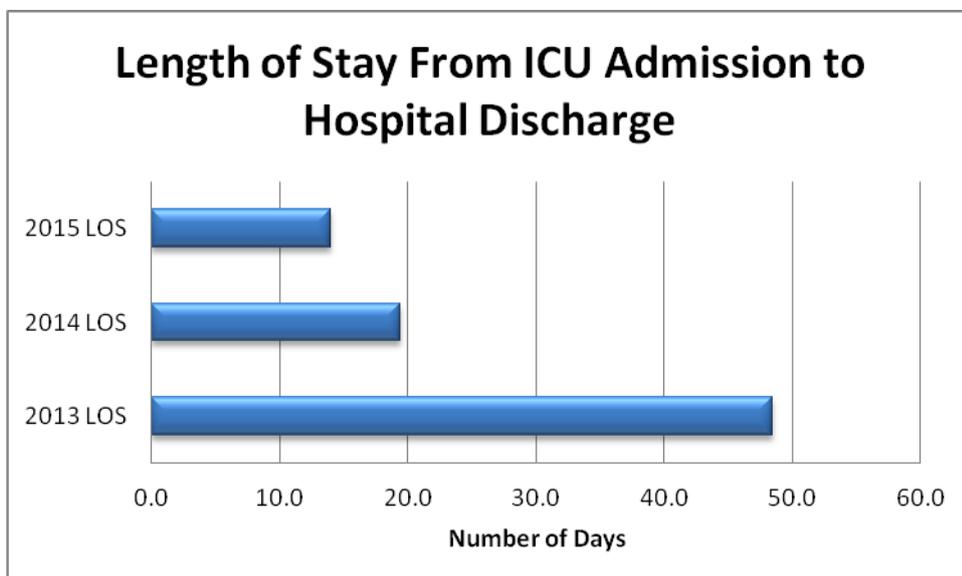
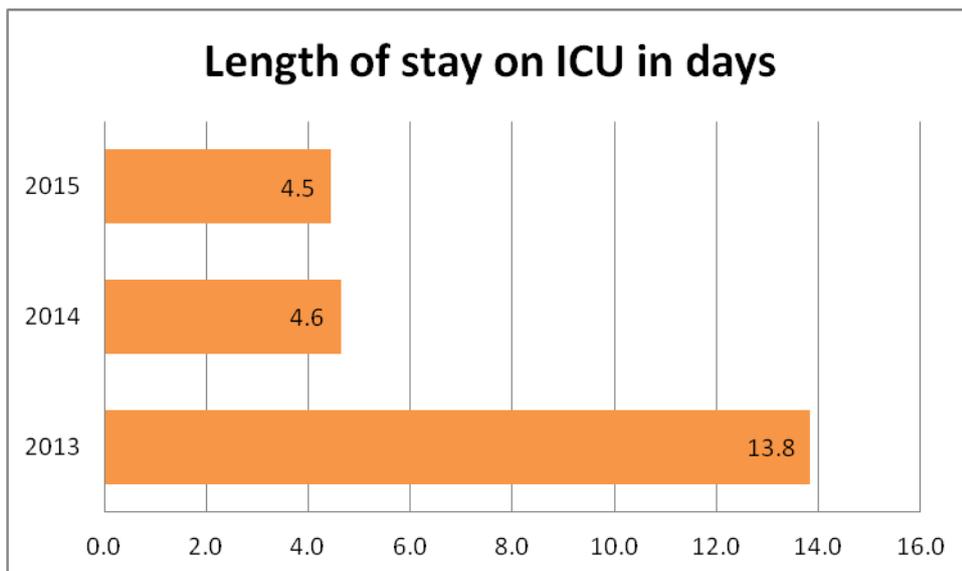
- III. Duration of physiotherapy rehabilitation session

- IV. In addition, limiting factors were recorded for 2015 if the patient did not receive 45 minutes rehabilitation. These were categorised as
 - Unwell
 - Patient unable to tolerate 45 minutes
 - Patient refused
 - Patient did not required 45 minutes rehabilitation
 - Staffing

35 patients were admitted to ITU in March 2013. 51 patients were admitted to ITU in March 2014 and 54 patients in 2015.

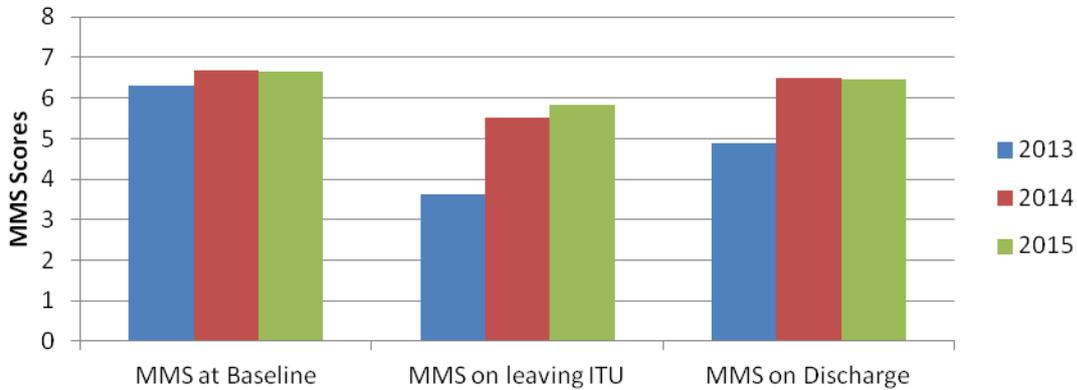
5. Results

With a greater emphasis on rehabilitation since 2014 there has been a significant decrease in ICU length of stay and hospital length of stay. Interestingly national data from the intensive care national audit and research centre (ICNARC) for 2015 shows length of stay on ICU hasn't changed over the past 3 years. National data from ICNARC reveals hospital length of stay for ICU survivors has reduced from 26 days to 23 days. Using rehabilitation to improve a patient's strength and endurance has helped to reduced ICU length of stay at Kingston Hospital by an average of 8 days. It has also reduced hospital length of stay from an average of 48 days to under 20 days.

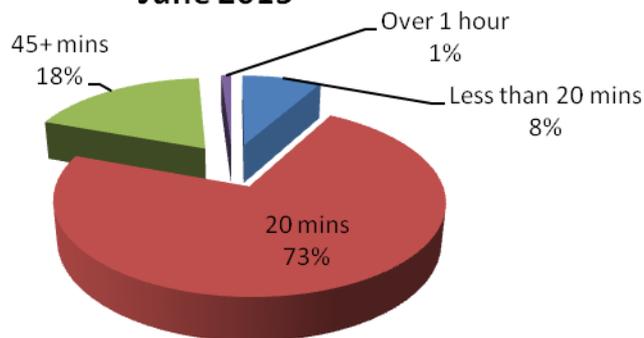


The graph below represents the patients 'Manchester mobility score' (MMS) at baseline (pre-admission level of function), on leaving ICU and on leaving Kingston Hospital. With a greater emphasis on early rehabilitation on intensive care in 2014 and 2015, patients leave ICU with better scores and greater functional independence.

A comparison of ICU patients functional MMS scores on admission, on discharge from ICU and discharge from hospital

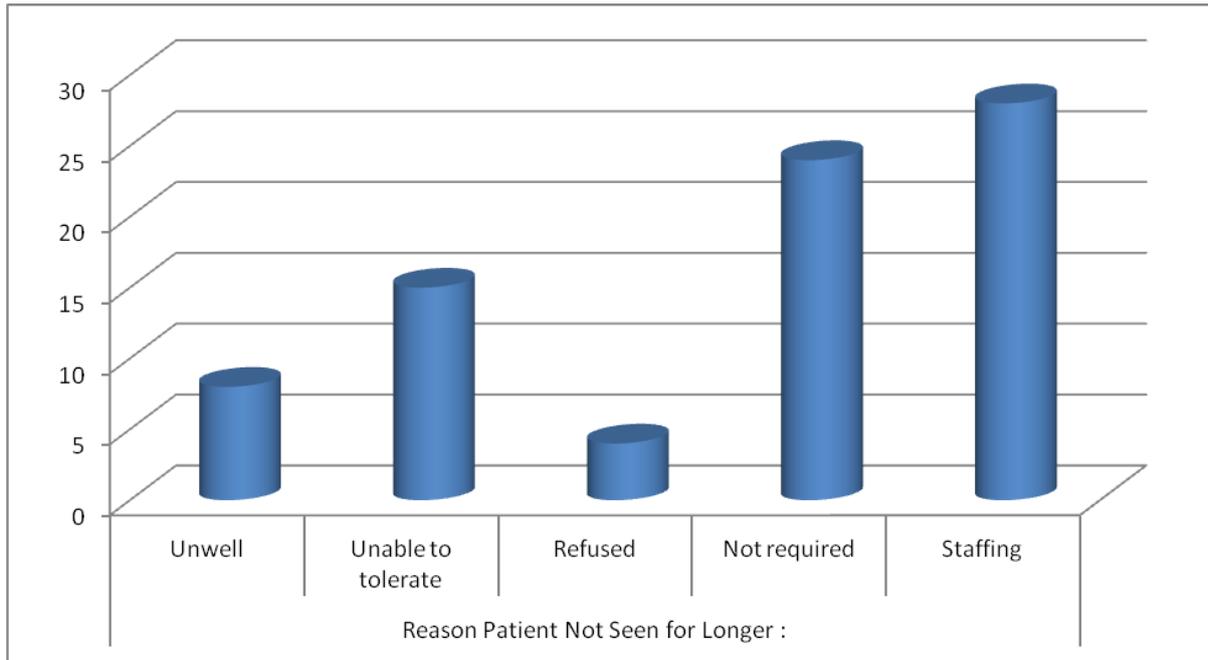


Physio Time Spent Assessing and treating patients on ICU in June 2015



The Core standards of ITU state 'patients receiving rehabilitation are offered a minimum of 45 minutesfor a minimum of 5 days a week' (Core standards for Intensive care units, 2013) with the recommendation that standards set in the stroke population should be mirrored for ICU patient groups (NICE quality standards for Stroke, 2010). Only 19% of patients on the intensive care unit at Kingston Hospital were seen for 45 minutes or longer in June 2015.

An audit investigating why these patients did not receive 45 minutes rehabilitation is displayed below. Staffing levels were found to be a major contributing factor.



6. Limitations of audit

1. This audit was undertaken during the month of March which potentially showed a small snap shot. Variance in length of stay and rehabilitation the patients received may have varied over the other months.
2. The data was collected by the physiotherapists involved in rehabilitation on ICU
3. This audit was an outcome rather than a process audit so the results do not correlate directly with the NICE Guidelines for rehabilitation after critical illness CG83

7. Conclusions

Assessing and treating physical morbidity through rehabilitation as recommended by the NICE Guidelines CG83 resulted in improved limb muscle strength resulting in better functional independence at discharge from ICU and the hospital. Early rehabilitation reduced ICU and hospital length of stay significantly. Staffing was the major limiting factor why patients did not receive 45 minutes rehabilitation as recommended by The Core standards for Intensive care units (2013).

8. Action Plan

| Recommendation | Action required | Possible barriers to implementation | Responsible person | Timescale |
|---|---|--|--------------------|---------------------------|
| Conduct a process audit rather than an outcome audit as per the NICE Guidelines | Collect data differently to enable guideline adherence to be reviewed | Time, staffing, availability of retrospective data | EO | 6 months |
| Increase physiotherapy staffing on ICU | Proposal to Physiotherapy manager, Matron & lead consultant on ICU Business case to be written | Financial pressures | EO, CH, AG, BB | Sept 2015 Dec 2015 |

| | | | | |
|---|--|--|---------------------|--------------------------------|
| Focus on goal setting as per NICE Guidelines | Collate data on twice weekly goal setting meetings to form suitable audit | Time, staffing, availability of retrospective data | Physiotherapy staff | 6 months |
| Present findings of audit to wider rehabilitation community | Present poster to Patient First Preventing Harm Improving Care Conference, Excel, London | None | | 13 th November 2015 |
| Increase provision of rehabilitation equipment to facilitate patients progression | D/W Matron | Financial | All | 4 months |

9. References

McWilliams DJ & Westlake EV (2011) The effect of a structured rehabilitation programme for patients admitted to critical care, *Intensive care medicine*, 2011 Sep, 37

Morris et al (2008) Early intensive care unit mobility therapy in the treatment of acute respiratory failure

Herridge et al, 2012 Functional disability 5 years after acute respiratory distress syndrome *New England journal of Medicine*, 364(14) 1293-304

Puthuchery et al (2013) Acute skeletal muscle wasting in critical illness *JAMA*, 310 1591-1600

Schweickert et al, 2009 Early physical and occupational therapy in mechanically ventilated patients: a randomised controlled trial *Lancet*, 373 1874-1882

Burtin et al, 2009 Early exercise in critically ill patients enhances short term functional recovery *Critical Care Medicine*, 37 2499-2505

NICE Guideline 83 Rehabilitation after Critical Illness 210

Core standards for Intensive care units 2013