Predicting Functional Outcome after Critical Illness – Use of CG83 Risk Factors

Twose, P.¹,² and McRae C.¹

¹Physiotherapy Department, Cardiff & Vale UHB; ²School of Health Science, Cardiff University;

Abstract

Introduction: Rehabilitation after critical illness (NICE CG83) identified risk factors for likelihood of physical morbidity. This evaluation aimed to explore if these risk factors could predict length of stay (LOS) and functional outcome.

Methodology: A prospective service evaluation was conducted at a tertiary referral critical care unit. Data was collected for patients admitted to critical care over a 4-week period.

Results: ‘At risk’ patients had significant greater critical care (p=0.035) and hospital LOS (p<0.021), poorer functional outcome scores (p<0.05) and greater requirement for support on hospital discharge.

Discussion and Conclusions: The risk factors identified within NICE CG83 can be utilised to determine likely functional outcome, physiotherapy requirements, critical care and hospital length of stay, and potential discharge locations.

Introduction and Aims

110,000 patients are estimated to be admitted to critical care in England and Wales each year, with significant and persistent physical, non-physical and social problems identified on discharge. An area impacting significantly on recovery is intensive care-acquired weakness (ICU-AW). The implications for this include increased mortality, days of mechanical ventilation, critical care length of stay and hospital length of stay. Furthermore, those with ICU-AW often have poorer functional outcome on discharge and greater requirements on community resources and primary care, with associated increased health costs. Recent guidelines have facilitated clinical critical care length of stay, rehabilitation strategies to support the early mobilisation of patients in critical care as soon as clinically appropriate. CG83 provided a framework to readily identify general adult patients in critical care at risk of developing ongoing morbidity. This allows prioritisation of those at highest risk of developing physical and non-physical morbidities for more comprehensive rehabilitation. However, it is yet to be explored if it is possible to predict patient physical and non-physical risk on initial assessment; and if it is possible, whether it can be used to estimate length of stay in critical care and hospital; amount of physiotherapy resources likely to be required; and possible discharge destination.

Study Aims:

1. Can CG83 risk factors be used to predict functional outcome
2. Can CG83 risk factors be used to predict clinical critical care length of stay, hospital length of stay and quantity of physiotherapy input

Study Design: A prospective service evaluation was conducted at a tertiary referral critical care unit within South Wales, UK. Data was collected for patients admitted to critical care from the 1st November 2015 to 30th November 2015

Sample and Sampling: A total of 115 patients were screened for inclusion, with 77 meeting the inclusion criteria. Of the 77 included, 23 did not require any physiotherapy input and therefore data was collected for these patients.

Exclusion criteria: Patients admitted to post anaesthetic care unit (PACU)

Data Collection: Demographic data was collected for age, gender, admission APACHE II and CG83 risk stratification. In addition data was collected for each of the following: Number of Level 3 days; Chelsea Physical Assessment (CPKs) scores and Critical care Functional Rehabilitation Outcome Measure (CCFROM) scores; and physiotherapy involvement both in critical care and within ward environment.

CG83 Risk Stratification

The eight risk factors identified were: 1) unable to get out of bed independently; 2) anticipated length of critical care stay of greater than 5 days; 3) obvious physical / neurological injury; 4) lack of cognitive function to exercise independently; 5) unable to ventilate with less than 35% oxygen; 6) unable to mobilise short distances; 7) pre-morbid respiratory pathology; and 8) pre-morbid mobility problems.

Those patients presenting with four of more of the above risk factors were considered to be ‘at risk’ of developing physical morbidity.

Methodology

The risk factors for physical morbidity (or ICU-AW) identified within NICE CG83 can be utilised to determine likely functional outcome, physiotherapy requirements, critical care and hospital length of stay, and potential discharge locations. The risk stratification can be completed immediately upon critical care admission and reflects the likely patient pathway. No individual risk factors were shown to have most impact on the patient pathway, however, with increasing numbers of risk factors, length of stay increased and functional outcome worsened. Further research is now required to determine the impact of enhanced rehabilitation to those determined as ‘at risk’ to reduce critical care and hospital length of stay, as well as improving functional outcome on discharge.

Results

<table>
<thead>
<tr>
<th>Low Risk</th>
<th>At Risk</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years (SD)</td>
<td>60.8 (14.3)</td>
<td>46.4 (19.6)</td>
</tr>
<tr>
<td>APACHE II (SD)</td>
<td>15.9 (6.7)</td>
<td>13.9 (7.5)</td>
</tr>
<tr>
<td>Duration of MV, days (SD)</td>
<td>5.0 (7.9)</td>
<td>9.6 (8.7)</td>
</tr>
<tr>
<td>Length of critical care admission, days (SD)</td>
<td>7.3 (8.9)</td>
<td>14.3 (17.5)</td>
</tr>
<tr>
<td>Outcome Adjusted</td>
<td>6.9 (10.0)</td>
<td>17.3 (18.6)</td>
</tr>
<tr>
<td>Critical Care Discharge CCFROM (max 70)</td>
<td>45.4 (20.7)</td>
<td>35.6 (27.8)</td>
</tr>
<tr>
<td>Length of hospital admission, days (SD)</td>
<td>18.4 (18.3)</td>
<td>31.9 (30.7)</td>
</tr>
<tr>
<td>Outcome Adjusted</td>
<td>18.5 (16.4)</td>
<td>39.3 (31.9)</td>
</tr>
<tr>
<td>Discharge CCFROM (max 70)</td>
<td>67.8 (6.8)</td>
<td>69.3 (18.8)</td>
</tr>
<tr>
<td>Physiotherapy Time, minutes</td>
<td>314.7 (328.8)</td>
<td>1124.5 (734.42)</td>
</tr>
</tbody>
</table>

References

National Institute for Health and Clinical Excellence (NICE) guidelines: Rehabilitation after Critical Illness 2009

Jones C, Griffiths R.D. Clinical Intensive Care 2000; 11: 35-8


CSP. Physiotherapy Works: Critical Care 2011

Parry SM, Puthucheary ZA. Extreme Physiology and Medicine 2014; 4: 16-23


Guidelines for the Provision of Intensive Care Services 2015, Intensive Care Society

Acknowledgements

No funding was allocated to the completion of this service evaluation. The authors acknowledge the assistance of the physiotherapy department

Address for Correspondence

Paul.Twose@wales.nhs.uk