Aftermath of intensive care: the scale of the problem

There can be physical, psychological and cognitive sequelae of critical illness, which have a significant impact on the patient's quality of life. This article discusses some of the recent work looking at the scale of the problem.

The physical, psychological and cognitive after effects of critical illness can be profound. Physical recovery may take over a year in some cases. In addition, patients often have poor recall of factual events of their critical illness and yet have very clear frightening delusional memories. This can result in high levels of anxiety, depression, panic attacks and post-traumatic stress disorder (PTSD). Studies have shown that some patients are left with significant cognitive impairment, which may affect their ability to care for themselves and return to normal life. This review examines some of the evidence for the after effects of critical illness and looks at the scale of the problem.

Physical sequelae of critical illness

Physical recovery following critical illness can in some cases take over a year, particularly in patients over the age of 50 years and those who have had a prolonged intensive care unit (ICU) stay (>5 days) (Jones and Griffiths, 2000). Physical weakness and easy fatiguability can be profound, and while in some cases this may be attributed to critical illness neuropathy, for many it is caused by the degree of muscle wasting that has occurred in the catabolic phase of critical illness, which is often masked by oedema during the time in ICU.

Loss of lean body mass, mainly skeletal muscle, may be staggering and can average about 2% loss per day (Griffiths, 2002). The factors involved in rebuilding of lost muscle are simple, i.e. physical activity and good nutrition, but the control in some cases of concomitant medical disease, such as heart failure or chronic obstructive airways disease, needs to be optimized to allow patients to exercise to the best of their ability. Jones and Griffiths (2000) showed that mobility at 2 months, in those patients staying on the ICU for 5 days or more, is still restricted, particularly outside. Of 148 patients, 44% either could not manage stairs or had difficulty climbing more than a few steps at a time, 29% were still using a wheelchair outside the house, 10% used a stick and 1% a zimmer frame. At 2 months 22% of patients had some joint pain, the most common site being the shoulders (12%) followed by the hands, fingers, knees, lower back, neck and hips (*Table 1*). Complaints of stiffness and pain in all the joints, including the back, are reported by 5% of patients. The high use of wheelchairs for mobilization outside was not explained by joint problems as those with knee, back or hip pain made up only 6% of wheelchair users.

The longer the ICU stay and the greater the patient's age the more likely that individuals will have problems post ICU (*Figure 1*). Patients frequently report frustration with the slowness of their physical recovery and often fail to appreciate how ill they have been. Pulmonary function recovery is generally very good in all but the most severe adult respiratory distress syndrome patients and in the absence of underlying chronic lung disease.

Psychological recovery

Critical illness can have profound long-term psychological and psychosocial after effects for both patients and their relatives. A large study of 3655 patients found a high incidence of psychosocial dysfunction, particularly for patients aged between 30–50 years of age (Tian and Reis Miranda, 1995). Patients attending the author's outpatient clinic showed high levels (25–30%) of anxie-

Table 1. Physical problems reported

Common physical problems (as reported at 2/12 by clinic patients $n = 148$)		Percentage of patients
Difficulty climbing stairs		44%
Mobility outdoors		29%
Needing a stick to mobilize indoors		12%
Joint pain or stiffness (shoulders make up 12%)		22%
Breathlessness contributing to difficulty with stairs		9%
Other physical problems	Loss of taste and smell	5%
	Small bladder syndrome (frequency and nocturia)	2%
	Dry skin or itching	5%
	Isolated paraesthesia (glove and sock paraesthesia now rarely seen)	10%
	Impotence	15%

Dr Christina Jones *is Nurse Consultant in Critical Care, Intensive Care Research Group, Intensive Care Unit, Whiston Hospital, Prescot and at the School of Clinical Science, University of Liverpool, Liverpool L69 3GA*

ty, depression and PTSD. The rate of PTSD varies with different studies (4–25%) and may reflect both patient case mix and the variety of different tools that have been used, most of which are screening tools giving levels of symptoms rather than full diagnostic instruments (Jones et al, 2003a).

A recent multi-national study looking at the incidence of PTSD across ICUs in different countries using a full diagnostic tool showed an average rate of 9.2%, varying from 3.2–14.8% across the different centres (Jones et al, 2007). Independent of case mix and illness severity the factors found to be related to the development of PTSD were patients' recall of delusional memories (hallucinations, nightmares and paranoid delusions), prolonged sedation, and physical restraint with no sedation. In the longer term these psychological problems can have a significant impact on quality of life. PTSD, in particular, is poorly diagnosed and may be associated with alcohol and drug abuse in the longer term; patients may attempt to control symptoms through self-medication.

In the UK the National Institute for Clinical Excellence (NICE) has produced a number of treatment guidelines for anxiety, depression and PTSD (NICE, 2004a, b, 2005) (these guidelines are all available as pdf documents on the NICE website). The main thrust of the guidelines is the need for assessment in high-risk groups such as ICU patients, appropriate referral for counselling or psychotherapy, a watch and wait approach for those patients with low symptom levels and the advice that psychoactive medication should only be used if the patient does not engage in psychotherapy. The guidelines also put the onus of assessment and recognition of these problems on all clinicians who interact with the patient. This means that critical care clinicians have a duty to patients and their families to recognize those who are in distress and not coping and ensure that appropriate help is offered to them.

Cognitive deficits post critical illness

Delirium during critical illness has been shown to be common and is probably the result of a combination of factors, such as the severity of illness and the large cumulative doses of sedative and/or opiate drugs patients receive. Longer-term cognitive deficits are now being reported and these may have an influence on patients being able to care for themselves. In adult respiratory distress syndrome patients 47% still had some impairment at 2 years post ICU (Hopkins et al, 1999).

One study with general ICU patients suggests that although some patients improve with time a significant number of patients remain impaired and may have problems with mental tasks such as financial management and driving (Sukantarat et al, 2005). These impairments often go unnoticed by health-care staff and it is the patient and their family who are aware of the change. In some cases the next of kin takes over the role of keeping track of hospital appointments where the memory problems patients are experiencing make this difficult. Patients can also have problems with strategic thinking and problem solving for some months after critical illness and tasks that require concentration, such as balancing a cheque book, may be affected.

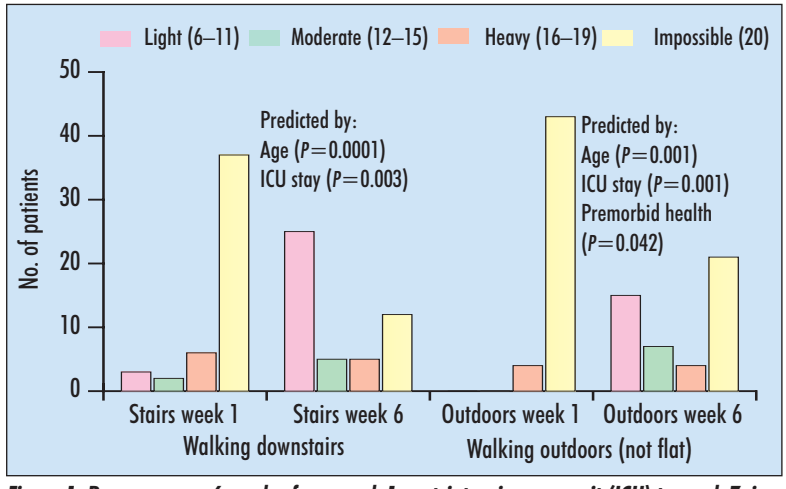
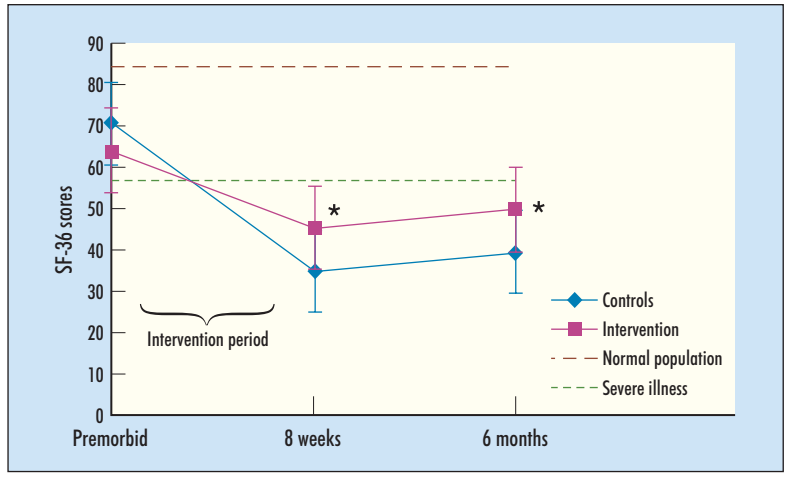


Figure 1. Recovery over 6 weeks, from week 1 post-intensive care unit (ICU) to week 7, in the effort (light, moderate, heavy and impossible) involved in patients walking downstairs and outdoors and the factors influencing the rate of change (P values repeat measures analysis of variance; ANOVA).

Rehabilitation post critical illness

The importance of rehabilitation has been recognized in other patient groups, such as post myocardial infarction, but largely neglected following critical illness. There is one study using a patient-directed, home-based rehabilitation programme which was tested in a randomized controlled trial at three hospitals against the routine follow up of ward visits and outpatient clinic visits (Jones et al, 2003b). The endpoints of the study were physical and psychological recovery and smoking cessation at 8 weeks and 6 months post ICU discharge. The programme was shown to accelerate physical recovery (*Figure 2*) and to be effective in aiding smoking cessa-

Figure 2. SF-36 physical function scores over time by rehabilitation group from Jones et al (2003b). *Repeated measures analysis of variance (ANOVA) P = 0.006.



tion. Psychological recovery, however, was much more complicated with a trend to lower levels of depression (12% *vs* 25% in the controls) but no reduction in anxiety or PTSD symptoms.

However, a non-randomized study suggested that the provision of an ICU diary giving a daily account of the patient's stay was associated with lower levels of PTSD-related symptoms (Jones et al, 2006). This was even more marked in those patients recalling delusional memories following their stay in ICU. This requires further research in the form of a controlled randomized trial to verify the results.

Conclusions

The combination of amnesia for the period of critical illness, possible recall of delusional memories and slow physical recovery means that patients have information and rehabilitation needs following a stay in ICU in order for them to make the best recovery possible. Following up patients on the wards and in outpatients allows the assessment of physical, psychological and cognitive problems and appropriate help to be organized. The use of patient diaries in ICU with photographs has the potential to help patients to fill the memory gap and possibly reduce PTSD-related symptoms. Physical, psychological and cognitive rehabilitation following critical illness is needed to ensure that patients return to as close to their optimum health and quality of life as possible. **BJHM**

KEY POINTS

- Physical recovery after critical illness can be prolonged.
- Psychological problems are common and include anxiety, depression and post-traumatic stress disorder.
- Cognitive deficits may include problems with memory, concentration and problem solving.
- Rehabilitation can accelerate physical recovery.
- Psychological health should be assessed after an intensive care unit stay and patients referred for appropriate help.

Conflict of interest: none.

Griffiths RD (2002) Nutrition after critical illness. In: Griffiths RD, Jones C, eds. *Intensive Care After Care.* Butterworth and Heinemann, Oxford: 48–52

Hopkins RO, Weaver LK, Pope D, Orme JF, Bigler ED, Larson-Lohr V (1999) Neurophysiological sequelae and impaired health status in survivors of severe acute respiratory distress syndrome. *Am J Respir Crit Care Med* **160:** 50–6

Jones C, Griffiths RD (2000) Identifying post intensive care patients who may need physical rehabilitation. *Clin Intensive Care* **11**(1): 35–8

Jones C, Twigg E, Lurie A, McDougall M, Heslett R, Hewitt-Symonds M, Griffiths R (2003a) The challenge of diagnosis of stress reactions following intensive care and early intervention: a review. *Clinical Intensive Care* **14**(3–4): 83–9

Jones C, Skirrow P, Griffiths RD et al (2003b) Rehabilitation after critical illness: A randomised, controlled trial. *Crit Care Med* **31**(10): 2456–61

Jones C, Capuzzo M, Flaatten H, Backman C, Rylander C, Griffiths RD (2006) ICU diaries may reduce symptoms of posttraumatic stress disorder. *Intensive Care Med* **32**(Suppl 1): S144

Jones C, Backman C, Capuzzo M, Flaatten H, Rylander C, Griffiths RD (2007) Precipitants of post traumatic stress disorder following intensive care: a hypothesis generating study of diversity in care. *Intensive Care Med* **33**(6): 978–85

National Institute for Clinical Excellence (2004a) *Anxiety: Management of Anxiety (Panic Disorder, with or without Agoraphobia, and Generalised Anxiety Disorder) in Adults in Primary, Secondary and Community Care.* National Institute for Clinical Excellence, London (www.nice.org.uk/pdf/CG022NICEguideline.pdf accessed 1 August 2007)

National Institute for Clinical Excellence (2004b) *Depression: Management of Depression in Primary and Secondary Care.* National Institute for Clinical Excellence, London (www.nice.org.uk/pdf/CG023NICEguideline.pdf accessed 1 August 2007)

National Institute for Clinical Excellence (2005) *Post-traumatic Stress Disorder – The Management of PTSD in Adults and Children in Primary and Secondary Care.* National Institute for Clinical Excellence, London (www.nice.org.uk/pdf/CG026NICEguideline.pdf accessed 1 August 2007)

Sukantarat KT, Burgess PW, Williamson RCN, Brett SJ (2005) Prolonged cognitive dysfunction in survivors of critical illness *Anaesthesia* **60:** 847–53

Tian ZM, Reis Miranda D (1995) Quality of life after intensive care with the sickness impact profile. *Intensive Care Med* **21:** 422–8