Can severely disabled patients benefit from in-patient neurorehabilitation for acquired brain injury?

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Neurorehabilitation may be most cost efficient in those with the most severe disability

The *Journal of Neurology, Neurosurgery and Psychiatry* publishes few papers on the systems and costs of health service provision. Those it does should have a clear clinical message for our multidisciplinary readership as is the case for the paper by Turner-Stokes *et al* (see pages 634–9) on the cost efficiency of neurorehabilitation.¹

Commissioners of health services, given the task of getting value for money for their patients, want to know that the treatments offered are effective and that the cost matches the size of the effect; treatments should be cost effective. But commissioners of rehabilitation services and long term care may also ask, can it save us money in the long term? By investing in this treatment will the patient need less expensive care in the future?

Turner-Stokes *et al* have addressed this last question by looking at the cost efficiency of in-patient neurorehabilitation; how efficient was their unit at reducing the costs of care? Assessment of the patient's dependency was used to estimate the daily cost of care; dependency levels at admission were compared to those at discharge and the reduction in daily continuing care costs calculated. Cost efficiency was defined as the number of days required for this reduced cost of continuing care to match the cost of the in-patient stay;

the shorter the time the greater the cost efficiency. Thus the in-patient stay of a patient who was heavily dependent at admission, but much less so at discharge, might be cost efficient despite the fact that the length of stay was very long, and therefore expensive. On the other hand, the (inexpensive) admission of a patient with a short length of stay might not be cost efficient if their care needs hardly changed during the course of the stay.

Turner-Stokes *et al* have then applied this measure of cost efficiency to examine the contention that there is little value in investing in the rehabilitation of very severely disabled patients who have suffered acquired brain injury because they are unlikely to improve regardless of how much rehabilitation effort is made. This is a conclusion that might be drawn from the observation that the most severely disabled may show no improvement in disability scores following rehabilitation,² and that those with intermediate scores make the most gains.³ Turner-Stokes *et al* confirmed that improvements in disability, measured using the functional independence measure (FIM), were most efficiently achieved in those with moderate disability. Despite this, cost efficiency was greatest in those with greatest disability; the more severe the disability the more quickly was the

investment going to be recouped. A little caution is needed in the interpretation of this finding. The FIM may well show floor effects. The costs of rehabilitation were calculated using a flat daily rate that was not dependent on severity of disability. This would probably have advantaged the severe disability group whose rehabilitation was likely to have been more expensive not just because of longer lengths of stay but also because each day was more costly. This was an observational study and it is possible that the improvements might have been seen regardless of rehabilitation. Some may argue that only randomised controlled trials can answer the important question, does rehabilitation work? But carefully considered analysis of routine data collection can inform clinical practice^{4–5} and may be particularly useful for answering the question, who benefits from rehabilitation?⁶ The rather surprising answer, in the case of in-patient neurorehabilitation, may be that it is the most disabled patients who can make the most valuable use of rehabilitation.

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