Should critically ill adults be transferred or retrieved?

The secondary transfer of patients between hospitals for specialist treatment or repatriation has resource ramifications and important patient safety implications. Mackenzie at al (1997) estimated that over 11 000 interhospital transfers occur per year in the UK and the task of ensuring the best possible patient outcomes represents a significant challenge for the NHS.

Currently in the UK the majority of transfers are carried out by a team from the referring hospital. This exposes the patient to risk centred around the level of experience and training of those accompanying the patient but also related to the objective hazards of transfers. Flabouris et al (2008) suggested that patient transfer is independently associated with increased mortality and a longer length of stay on the intensive care unit. It is also well established that adverse events during patient transfer can lead to poor outcomes, particularly in patient subgroups such as the traumatic brain injury cohort as highlighted by Gentleman and Jennett (1981).

An alternative model used elsewhere in the world, and one that is currently used to transfer paediatric and other specialist patient groups in the UK, is the retrieval model. This model comprises a dedicated specialist team whose raison d'être is to facilitate the transfer of critically ill patients.

Which model is preferred?

At governmental level retrieval teams have been advocated by the Department of Health. Supporting evidence comes from a prospective observational study conducted in the Netherlands by Wiegersma et al (2011) that looked at physiological para-meters in patients transferred by their 'mobile intensive care unit' in 2009 and compared them to prospectively collected data on patients transferred by ambulance in 2005 in the same region. Distribution of differences in arterial blood gases during transfer in 2009 *vs* 2005 showed significantly better values for the variables pH (P=0.02), PaO_2 (P=0.001) and $PaCO_2$ (P=0.02) in the patient group transferred by mobile intensive care unit. There was also a significant increase in the number of patients who were transferred without a specialist retrieval team and who required emergent airway management immediately after arriving on the intensive care unit.

Bellingan et al (2000) compared patient outcomes between those who were transferred by a specialist retrieval team (group A) and those who were transferred by a team from the referring hospital (group B). Both groups were well matched with no significant differences in demographic characteristics and severity of illness; significantly more patients in group B were severely acidaemic compared to those in group A (pH <7.1 11% *vs* 3%, P<0.03) and hypotensive (mean arterial pressure <60 mmHg 18% *vs* 9%, P<0.03) on arrival at the receiving hospital. Most importantly there were more deaths within the first 12 hours after admission with 7.7% deaths (7/91) in group B *vs* 3% (5/168) in group A.

Expert opinion favours retrieval as the gold standard for patient transfer and the Intensive Care Society (2011) and the Association of Anaesthetists of Great Britain and Ireland (2009) have adopted guidelines advocating the retrieval model.

Evidence against retrieval is not borne out in the literature. One could postulate that if reliance was placed on retrieval teams then occasionally unforeseen circumstances could require deskilled staff to perform the precarious task of patient transfer. If the capacity of a retrieval service was overwhelmed leading to delays the likely ensuing indecision over how to transfer the patient would further delay what is already likely to be a suboptimal transfer. The cost of equipment procurement including vehicles, and staff training would be a significant burden on any burgeoning retrieval service making this model less economically viable.

Conclusions

The authors recognize that there is a need to conduct quality randomized controlled trials in this area. Taking into consideration the available evidence and in line with expert opinion it is the authors' view that critical care networks should move towards the retrieval model to facilitate an equitable and safe transfer system. BJHM

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