Improving interhospital paediatric transport

**Comment**

In *The Lancet* today, Padmanabhan Ramnarayan and colleagues report the outcomes of unplanned admissions to paediatric intensive care units (PICUs) in England and Wales, UK. Contrary to some studies, today’s investigators found that patients’ outcomes were better when patients were transferred from external sources (local hospitals) rather than from internal sources (wards within the same hospital as the PICU), and patients’ survival was better when critically ill children from other hospitals were transported by specialist retrieval teams rather than non-specialist retrieval teams.

Of the nearly 58,000 children admitted to PICUs in today’s study, crude mortality rates of 8% were reported in 17,649 unplanned admissions from other hospitals, and of 6% in 15,843 unplanned admissions from within the same hospital (odds ratio [OR] 1·27, 95% CI 1·16–1·38). The risk-adjusted mortality rate was lower in patients admitted from external sources than among those admitted from internal sources (0·65, 0·53–0·80). Items of the paediatric index of mortality score were used as a risk-adjustment method; they were collected during the first hour in PICUs for internal admissions, and data missing at first contact between patient and retrieval team were collected up to the first hour after PICU admission for external admissions. Many items of the paediatric index of mortality score are modulated by management, such as the ratio of FiO₂ to PaO₂ (fraction of inspired oxygen to partial pressure of arterial blood oxygen).

24 countries that contributed to the study, yearly health expenditure per citizen varies from $40 to $5500 (2007 US dollars), which reiterates the important moral question—what is the justification for introducing a treatment that might enable one individual to live a few months longer, but will consume, for each person treated, the total yearly health expenditure for scores of their fellow citizens?

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Some treatments that were started by retrieval teams onsite before transport could have increased the risk of mortality, resulting in a better-adjusted mortality rate in patients admitted from external sources than from internal sources, but it is impossible to estimate the importance of this problem with the data provided by Ramnarayan and colleagues.

The higher adjusted mortality rate in admissions from external sources compared with admissions from internal sources might also be attributed to selection bias, or to the absence of an early warning system or medical outreach team in participating hospitals. Early warning systems help nurses to more quickly identify patients in need of further assistance, and therefore staff on other hospital wards are informed sooner.6,16 A medical outreach team can improve how patients’ calls are handled. Outreach teams and early warning systems seem to improve the outcome of patients transferred from paediatric wards to PICUs.1,5,8–11 However, Ramnarayan and colleagues did not report data on these systems. The outcome of unplanned admissions to PICUs from external sources might be better than from internal sources when done in a centralised system by a specialist retrieval team, but uncertainty remains.

Ramnarayan and colleagues reported higher survival rates in 13729 critically ill children transferred by specialist retrieval teams than in 3146 transferred by non-specialist teams (0.58, 0.39–0.87). Other studies have reported similar findings.5-11 A specialist team consists of nurses and respiratory therapists with several years of paediatric critical care experience and skill training in transport medicine (some teams have a resident, fellow, or specialist in paediatric critical care or emergency medicine).5,10 Before transport, a specialist retrieval team can provide guidance to caregivers from the local hospital; furthermore, it can stabilise the critically ill child on site before transfer.10

The American College of Critical Care Medicine recommended that each hospital should develop its own plan for intrahospital and interhospital transport of critically ill patients;12 Ramnarayan and colleagues’ study suggests this plan should include a paediatric specialist retrieval team. The transport of critically ill children from a local hospital to a regional PICU was as safe, if not safer, than the transport from internal sources when done by a specialist retrieval team. However, it is too soon to determine whether paediatric specialist retrieval teams should do all transports to PICUs. More studies that evaluate the severity of illness with similar criteria collected at a similar time to today’s study (first hour after contact) are needed. In future studies, attention must be paid to the case-mix and to the decision process that leads to transport by a specialist or a non-specialist retrieval team. Finally, data must be collected on the expertise of the retrieval team, distance between hospitals, patients’ stabilisation before PICU admission, and the presence of an early warning system and an interhospital outreach team in local and regional hospitals.

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