Transporting critically ill children

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Abstract

Increasing centralization of paediatric intensive care services and a reduction in the numbers of children cared for in adult intensive care units over the last 15–20 years has led to an increase in the numbers of critically ill children being transferred between clinical centres throughout the UK. Seventy-seven per cent of these retrievals are conducted by a specialist paediatric intensive care unit (PICU) team, the remainder by various other teams (with and without specialist intensive care experience). Various pressures made it increasingly difficult for PICUs to facilitate the timely retrieval of critically ill children whilst maintaining the provision of quality care to children already under their supervision. This situation has led to the development of regional, stand-alone transport teams throughout the UK. A typical example of such a team is the North West & North Wales Paediatric Transport Service (NWTS). This team uses the structured approach 'ACCEPT', advocated by the Advanced Life Support Group, Neonatal, Adult and Paediatric Safe Transfer and Retrieval (NAPSTaR) course. This acronym summarizes the key components of transfer: Assessment, Control, Communication, Evaluation, Preparation/Packaging, Transportation and places the evaluation, planning and execution of these elements in context by considering the defining features of transport medicine summarized as 'SCRUMP': Shared assessment, Clinical isolation, Resource limitations, Unfamiliar equipment, Movement and Safety and Physiology. Regional transport teams have improved patient outcomes and experiences when compared to previous models of service delivery. The approach used by these services may be adopted by all teams providing intra- and inter-hospital transfer of the sick or injured child.

Keywords Children; critical care transport; paediatrics

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Learning objectives

After reading this article, you should be able to:

- define the extent and nature of retrievals of critically ill babies, children and young people conducted currently in the UK
- list the benefits of a stand-alone regional transport service such as NWTS
- describe the optimal structure of organizing the retrieval of a critically ill child

Regional specialist paediatric transport services

Nicholas Geldard, a 10-year-old boy from the North West of England, died in 1995 during transfer to a PICU for specialist care following an intracranial bleed. He was transferred between four different hospitals, including a final transfer to an out-of-region PICU bed because both the PICUs in-region were full. The Ashworth inquiry into his death revealed a 'curious mix of praiseworthy staff commitment, ghastly misjudgement sending Nicholas out of region, ponderous bureaucracy that bedevils clinicians seeking expert advice and treatment' and 'wasted time finding intensive care beds'. Ashworth was shocked to learn that Nicholas's distressed parents had been unable to travel with their son, and been left to drive to a hospital in a strange city at 3 o'clock in the morning through a snow storm with no address or directions.[1] Over the last 20 years the learning from this and similar events has led to the development of service models that ensure that, wherever logistically possible, critically ill or injured children receive the right care, in the right place and at the right time and that their parents are supported throughout this process.[2] This model is largely orchestrated by the regional retrieval services working in concert with regional PICUs and the local hospitals they serve.

Following on from the NHS review of paediatric intensive care provision in UK (Paediatric Intensive care: Framework for the Future, 1997) paediatric intensive care in the UK was centralized, resulting in increased requirement for specialist transport services. Evidence from the literature supports the development of specialist transport services; providing safer transfers with fewer adverse events than those conducted by non-specialist teams.[3] Over time, changes to the structure of medical training in UK have made it increasingly difficult for PICUs to facilitate the timely stabilization and transfer of critically ill children whilst maintaining the quality of care being provided to their existing patients. This has led to the development of regional, stand-alone transport teams throughout the UK over the last 15 years.

In addition to stabilization and transport, specialist transport services provide access to co-ordinated, specialist consultant advice on patient management from the point of first contact. This advice may optimize management and prevent further deterioration; it may avoid the need for a transfer to a PICU. Regional transport teams use conference call facilities that engage with appropriate specialists throughout the referral and transfer process. This improves overall communication and facilitates co-ordination of care. It also ensures that the referring team receive appropriate specialist advice early during the stabilization period. Once a patient is accepted for transport, the transport teams take full responsibility for locating and securing an appropriate paediatric critical care bed; this allows the referring team to

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The SCRUMP mnemonic

Shared assessment	Inter-hospital transfer requires agreement from the referring, accepting and the transport teams that transport is appropriate, including timing, transfer method and final destination.
Clinical isolation & Resource limitations	During transfer a team is isolated, and requires sufficient expertise and equipment to ensure that they can provide optimal care for their patient whatever happens. Mobile phones may provide external expert advice, but cannot be relied on.
Unfamiliar equipment	Ad hoc teams may be using unfamiliar equipment that they may be trained on but not have used for a prolonged period. Regular training sessions should be provided on the equipment used for all those who will undertake patient transfers.
Movement & safety & Physiology	Critically ill patients may not tolerate forces of acceleration and deceleration well; small children and neonates are especially vulnerable to cold environments. Patients with pathology associated with entrapped air pockets may be adversely affected due to atmospheric pressure changes during flight. A working knowledge of these factors and how to mitigate against them is essential for a safe transfer.

Table 1

The ACCEPT mnemonic

Assessment	Thorough & methodical — using an ABCDE approach Includes: • What is the problem? • What is being done? • What effect is it having? • What is needed now?
Control	Identify a team leader Key tasks should be identified and allocated to specific individuals. Tasks should be within the capability of an individual to ensure best care for the patient and to maintain morale within the team
Communication	Clear communication is fundamental to a safe transfer Failures account for majority of adverse incidents or complaints. Communication should be directed by the leader, but the leader does not have to undertake all aspects Before transfer, liaise with the receiving team, briefly summarizing (2—3 sentences) the patients' clinical condition and current requirements Multidisciplinary handover (verbal and written) between nursing and medical staff is good practice. It must include a summary of all relevant information from first presentation to the end of transfer, all relevant images, observations and drug administration records
Evaluation	Appropriateness of transfer How urgently the patient should be transferred How unstable the patient is Method (road or air) Who should transfer the patient? In the UK the majority of transfers are by road, but if a patient requires a longer transfer (more than 90—120 minutes) or to areas with poor road connections then air transfer should be considered
Preparation & packaging	Stabilization of the child — using an ABCDE approach Preparation of equipment Preparation of staff Ideally any critically sick or injured child should be transferred with two points of intravenous access, which may include a central line or intra-osseous line (if inotropes are required) Checklists assist a team to prepare for any event during transfer, e.g. additional inotrope infusions, fluid boluses or reintubation kit The patient, team members and all equipment must be safely secured throughout the journey to prevent any injury especially in the unlikely event of an accident en route to the receiving hospital
Transportation	At all stages of transfer (moving between referring unit and ambulance, during transfer and from ambulance into receiving unit) any tube, line or monitoring is at risk of being dislodged. Care should be taken with lines and tubes to ensure that they are not hanging off the bed or trolley and vulnerable to snagging Most transfers (if child has been stabilized) will be uneventful. However, it is important that the team remains vigilant during transfer — deterioration may be due to patient physiology or equipment. If deterioration occurs check the patient using an ABCDE approach and address issues as identified

Table 2

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