



AAGBI SAFETY GUIDELINE

Interhospital Transfer

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Section 1 Recommendations

1. Transfer can be safely accomplished even in extremely ill patients. Those involved in transfers have the responsibility for ensuring that everything necessary is done to achieve this.
2. The need for transfers between hospitals is likely to increase. Transfers for non-clinical reasons should only take place in exceptional circumstances and ideally only during daylight hours.
3. The decision to transfer must involve a senior and experienced clinician.
4. Hospitals should form transfer networks to coordinate and manage clinically indicated transfers.
5. Networks should take responsibility for ensuring that arrangements can be made for accepting transfers to an agreed protocol with minimal administrative delays.
6. Protocols, documentation and equipment for transfers should be standardised within networks.
7. All doctors and other personnel undertaking transfers should have the appropriate competencies, qualifications and experience. It is highly desirable that this should include attendance at a suitable transfer course.
8. A professional, dedicated transfer service has many advantages and is the preferred method of transferring suitable patients.
9. Hospitals must ensure that suitable transfer equipment is provided.
10. Hospitals must ensure that they have robust arrangements to ensure that sending personnel on a transfer does not jeopardise other work within the hospital.
11. Hospitals must ensure that employees sent on transfers have adequate insurance cover and are made aware of the terms and limitations of this cover.
12. Arrangements must be in place to ensure that personnel and equipment can safely and promptly return to base after the transfer.
13. Details of every transfer must be recorded and subject to regular audit and review.

Section 2 Background

The AAGBI Council decided to commission a Working Party to produce guidelines in the usual format of the Association to provide instruction and help to those arranging transfers and those involved with the actual transfer of the patients between hospitals.

A large number of interhospital transfers already take place and the number is likely to increase. Anaesthetists are commonly involved in transferring the sickest of these patients. This has the potential to affect an Anaesthetic Department's budget and ability to maintain a service and on-call rotas. This document addresses transfers between hospitals, not within a hospital. However, the principles for the safe movement of patients are also applicable to transport within a hospital.

Section 3 Introduction

In 1997 it was estimated that over 11,000 critically ill patients were transferred between intensive care units in the UK [1]. The majority of transfers are for appropriate clinical reasons for patients requiring care not available in the referring hospital. Such specialist care includes neuroscience, paediatrics, burns, spinal injury, etc. There is a limited number of paediatric and neonatal centres with high-level critical care support. Transfer of critically ill children must be a consideration in any hospital with an emergency department. Many transfers are undertaken for non-clinical reasons commonly related to the relative lack of critical care beds. It is government policy that these transfers should be as few as possible and contained within critical care transfer groups [2]. A relatively small percentage of patients transferred between hospitals involve repatriations of patients previously transferred. Patients may be transferred from the emergency department, critical care units, operating theatres, wards or other areas of the hospital. Transfers often occur outside of normal working hours and take place at short notice [3]. During the transfer the patient is in a noisy, difficult and potentially dangerous environment and the transferring medical team is operating independently. All hospitals that may be involved in transfers must ensure that the appropriate personnel, equipment, training and support are available. In the past, inexperienced doctors with inadequate training, supervision and equipment carried out many of the transfers [1,3-5]. Although the situation has improved, in many regions of the country there are still significant limitations in the process of arranging and carrying out a transfer.

This booklet should be read in conjunction with 'Recommendations for the Safe Transfer of Patients with Brain Injury' published by the Association of Anaesthetists in 2006 (<http://www.aagbi.org/publications/guidelines/docs/braininjury.pdf>). Other guidelines have been published including those from the Intensive Care Society ([6] available from www.ics.ac.uk). This booklet is not intended to be an in-depth document on transfer but should be read in conjunction with these and other guidelines.

Section 4 The decision to transfer

It is essential that a systematic approach is taken to the process of patient transfer; starting with the decision to transfer, through the pre-transfer stabilisation, and then the management of the transfer itself. This will encompass all the stages including skilled evaluation, communication, documentation, monitoring and treatment, handover and return to base. Education and preparation are central to any safe transfer.

The decision to transfer must not be taken lightly. It has the potential to expose the patient and transferring staff to additional risk, requires trained personnel, specialised equipment and a vehicle, and may result in additional expense and worry for carers and relatives. A senior doctor, normally a consultant, should therefore be involved in making this decision. Documentation of the decision should include the name of the doctor making the decision with their grade and contact details, and the date and time at which the decision was made. Reasons for the decision should be given including whether it is for clinical or non-clinical reasons.

Once the decision is made a hospital and medical team must agree to take the patient. In much of the United Kingdom critical care transfer groups have been established with a role of co-ordinating and facilitating transfers within a network. If a critical care bed is required, direct consultant-to-consultant contact is often the best way to make arrangements. In the appropriate circumstances and for the right patient many intensive care units are able to accommodate patients at short notice. However, the further away the referring hospital and the more tenuous the links, the less responsibility the accepting hospital is likely to feel. We would therefore strongly advise groups of hospitals to form networks to facilitate and organise transfers.

Most of the country is covered by bed bureaux such as the Emergency Bed Service (EBS). They contact critical care units on a regular basis and are able to provide some indication of the availability of beds. They do not take responsibility for arranging the transfer and it is still necessary to negotiate directly with individual units. Once a critical care unit has agreed to accept a patient it is necessary for the patient's medical team to arrange for the appropriate medical speciality in the receiving hospital to take overall responsibility for the patient during their admission to that hospital.

This process may require many telephone calls and take several hours [7]. Streamlining this process should be a responsibility for a transfer network. The process of arranging the transfer must be documented including the name, grade and contact details of those making the arrangements both at the referring and receiving centres, the date and time of calls made and details of any advice received.

A limited number of retrieval services able to perform transfers exist in the UK, mainly covering paediatric patients. A professional, dedicated transfer service has many advantages and is the preferred method of transferring suitable patients. Networks should aim to fund and develop such teams. Members of these teams have the training and competencies to undertake transfers; such teams have appropriate equipment and can work with the ambulance service, hospitals and other interested parties on protocols and guidelines. They also ensure that transfers can be safely achieved without compromising the work of the transferring hospital.

Although these services are extremely welcome they cannot be relied upon to provide a service at short notice and at all times [8-10]. Every hospital that may transfer patients must have suitable arrangements in place for providing transfers. Most transfers are in an ambulance by road. There is an increasing number of transfers in rotary and fixed wing aircraft. Air transfers confer additional hazards and expense and require further training [11,12].

Section 5 Stabilisation before transfer

Although transfers are potentially associated with additional risk to patients [13-15], they can be safely accomplished even in extremely ill patients [16-18]. Generally, a transfer should not be undertaken until the patient has been resuscitated and stabilised. All hospitals involved in transfers must ensure that they have appropriate arrangements in place for this. It may be several hours after the decision to transfer before the transfer can take place. It may be necessary to secure the airway, and many patients will require a tracheal tube or tracheostomy with appropriate end-tidal carbon dioxide monitoring. Appropriate venous access must be in place and monitoring instituted. Continuous invasive blood pressure measurement is the best technique for monitoring blood pressure during the transfer of ill patients. Treatment should not be delayed while waiting for the transfer. The accepting hospital may be able to provide advice on the immediate management in specialised situations. A 'scoop and run' philosophy is only appropriate on rare occasions when the urgency of the situation and the need for definitive treatment will limit the time available for stabilisation before transfer. For example, transfer of a patient with a leaking aortic aneurysm to a vascular centre may be time-critical. Even in these situations the transfer should not begin until essential management and monitoring has been undertaken. It is good practice to establish the patient on the transport ventilator and other equipment for a period of time before they are moved.

Section 6 Accompanying the patient

A critically ill patient should be accompanied by a minimum of two attendants. The precise requirement for accompanying personnel will depend upon the clinical circumstances in each case. The level of a patient's critical care dependency provides a guide to the personnel who should accompany them [19]. A senior doctor, normally a consultant, should take the decision on who should accompany the patient. Before departure the senior individual undertaking the transfer should be satisfied with the state of the patient and all other aspects associated with the transfer. Many patients do not need anaesthetic support during interhospital transfer.

These patients include:

- patients who are not likely to need airway or ventilatory support
- patients for whom attempting cardiopulmonary resuscitation would be inappropriate
- patients being transferred for acute definitive management for whom anaesthesia support will not affect their outcome

Levels of patients' critical care needs as a guide to transfer requirements. The decision should be made by a senior doctor [19]

Level 0:

Patients whose needs can be met through normal ward care in an acute hospital should not usually need to be accompanied by a doctor, nurse or paramedic.

Level 1:

At risk of their condition deteriorating, or those recently relocated from higher levels of care and whose needs can be met on an acute ward with additional advice and support from the critical care team will require a paramedic ambulance crew and may require a nurse, paramedic and/or medical escort.

Level 2:

Requiring more detailed observation or intervention including support for a single failing organ system or post-operative care and those stepping down from higher levels of care must be escorted by competent, trained and experienced personnel, usually a doctor and a nurse or paramedic.

Level 3:

Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure. These patients must be escorted by competent, trained and experienced personnel, usually a doctor and a nurse or paramedic.

When the request for anaesthetic care during transfer exceeds the Department of Anaesthesia's ability to do this safely, decisions about priority and relative risk may have to be taken. Although the patient would benefit from anaesthesia management, the issue may be one of either delaying transfer until resources are available or sending the patient without an accompanying anaesthetist but with another doctor. Anaesthetic Departments should use interhospital transfers to provide doctors with training and experience under the direct supervision of an experienced transfer team.

All individuals involved in the transport of critically ill patients should be suitably competent, trained and experienced. A competency-based training curriculum is being developed by the Royal College of Anaesthetists. There are generic training courses available but consideration should be given to the development of local Trust and Network training and simulation programmes. Good communication skills are essential. Each Trust should have a designated consultant who is responsible for secondary transfers, guideline production and training and audit.

While safety is of paramount importance during transfer, there is always a remote possibility of an ambulance being involved in an accident resulting in death or serious injury to staff. The insurance situation in these circumstances is complex. It is essential that all members of staff who might be involved in transporting patients and their employers ensure that adequate financial arrangements are in place for themselves and their dependents in the event of an accident and that they are made aware of the terms and limitations of this cover. In addition, the AAGBI has negotiated insurance for all their members involved in the transport of critically ill patients. Details of the appropriate insurance schemes and the cover benefit of membership are available from the AAGBI (www.aagbi.org). The AAGBI also recommends that doctors involved with the transfer of patients are members of a medical defence organisation.

Section 7 Monitoring, drugs and equipment

Patients with level 1, 2 or 3 critical care needs will require monitoring during the transfer. Monitoring needs to be established and secure before the transfer is started. This may require the insertion of central venous lines, arterial lines and equipment for measuring cardiac output, as well as end-tidal carbon dioxide monitoring.

The personnel involved in the transfer should ensure that they have adequate supplies of the necessary drugs. These may include sedatives, analgesics, muscle relaxants, and inotropes. Many of these drugs are best prepared beforehand in pre-filled syringes. The patient should be established on the medication to be used during the transfer before the transfer commences.

As much of the equipment as possible should be mounted at or below the level of the patient. In particular, large arrays of vertical drip stands should be avoided. This allows unhindered access to the patient and improves stability of the patient trolley. All equipment should be robust, durable and lightweight. Electrical equipment must be designed to function on battery when not plugged into the mains. Additional batteries should be carried in case of power failure. Portable monitors should have a clear illuminated display and be capable of displaying ECG, arterial oxygen saturation, non-invasive blood pressure, two invasive pressures, capnography and temperature. Non-invasive blood pressure may rapidly deplete battery power and is unreliable when there is external movement and vibration. Alarms should be visible as well as audible in view of the loud background noise levels.

Portable mechanical ventilators should have, as a minimum, disconnection and high pressure alarms, the ability to supply positive end expiratory pressure and variable inspired oxygen concentration, inspiratory:expiratory ratio, respiratory rate and tidal volume. In addition, the ability to provide pressure-controlled ventilation, pressure support and continuous positive airway pressure is desirable. Additional equipment for maintaining and securing the airway, intravenous access, etc should also be available.

Ideally, all equipment within a Critical Care Network should be standardised to enable the seamless transfer of patients without, for example, interruption of drug therapy or monitoring due to incompatibility of leads and transducers.

Section 8 The ambulance

The European Committee for Standardisation has published specifications for ambulances. Private transport services may use Type C mobile ICU vehicles. These will have 240V AC power, a secure critical care trolley and carry a ventilator and syringe drivers. It is more usual to request an ambulance from the local ambulance service to perform the transfer. This is likely to be a Type B or equivalent vehicle that has 12V electric sockets, oxygen supply and limited monitoring and other equipment.

Before transfer it is essential to ascertain what needs to be taken with the patient to support the transfer. The oxygen supply and battery operated equipment must be more than sufficient for the anticipated duration of the transfer. Unless a transfer service is used, everything except the oxygen supply usually has to be supplied by the transferring hospital. Hospitals involved in transfers must ensure that the appropriate equipment is available for likely transfers at all times.

The standard ambulance trolley is ill-suited to patient transfers. Ideally, it should be able to carry all the equipment including oxygen supply, a ventilator, syringe drivers, suction and backup batteries. These items should be placed below the patient, and the trolley should be secured within the ambulance to allow free access to all sides with a fixation capable of withstanding up to 10 G in all directions. It is not acceptable to place items on the patient's trolley or on shelves within the vehicle. Gravity feed drips are unreliable in moving vehicles. Sufficient syringe or infusion pumps are required to enable essential fluids and drugs to be delivered. Pumps should preferably be mounted below the level of the patient and infusion sets fitted with anti-siphon devices. Portable warm-air devices for maintaining the patient's temperature can be useful and can also be mounted on the patient's trolley.

A major issue relating to safety during transport is the speed of travel. For the majority of cases high-speed travel is not necessary and the safety of all passengers and other road users is paramount. Medical personnel present may offer advice as to the patient's clinical condition and the speed of travel but they should be aware of the requirements of the Road Traffic Act in such cases. The decision to use blue lights and sirens rests with the ambulance driver. The goal is to facilitate a smooth and rapid transfer with the minimum acceleration and deceleration. A police escort may be required through

heavily congested areas, but not all police authorities provide this service. Staff should remain seated at all times and wear the seat belts provided. If, despite meticulous preparation, unforeseen clinical emergencies arise and the patient requires intervention, this should not be attempted in a moving ambulance. The vehicle should be stopped appropriately in a safe place and the patient attended to. Where staff may be required to move outside the vehicle, high visibility clothing must be worn. On safety issues all staff in the vehicle must obey the instructions of the crew.

Air transport should be considered for longer journeys where road access is difficult or when, for other reasons, it may be quicker. Perceived speed of air transport must be balanced against organisational delays and inter-vehicle transfers at either end of the journey. Helicopters vary in size, capacity and range. They generally provide a less comfortable, more cramped environment than a road ambulance or pressurised fixed wing aircraft. In addition, they are expensive and have a poorer safety record.

The transport of patients by air presents medical escorts with many problems unique to this mode of travel. Staff involved in aeromedical transport must have both a high level of expertise, specialist knowledge and practical training. Staff without appropriate training should not undertake aeromedical transfers. Minimum requirements include safety training, evacuation procedures for the aircraft and basic on-board communication skills (particularly for helicopters). However, more advanced training in aeromedical transport medicine is desirable. Training should also address the special physical, physiological and psychological stresses that are important when flying as well as provide a detailed knowledge of how medical conditions can be affected by this environment and the necessary precautions needed to facilitate safe transfer.

Section 9 Documentation and handover

Clear records should be maintained at all stages. This is a legal requirement and should include details of the patient's condition, reason for transfer, names of referring and accepting consultants, clinical status prior to transfer and details of vital signs, clinical events and therapy given during transport. Standard documentation should be developed across networks and be used for both intra-hospital and interhospital transport. The clinical record should briefly summarise the patient's clinical status before, during and after transport, including relevant medical conditions, environmental factors and therapy given. This should include a core data set for audit purposes and the transport team should be able to retain a duplicate. There should be a process to investigate specific problems, including delays in transportation.

Clear information should be given to the transport team before departure about the location of the receiving area for the formal handover of the patient. On arrival at the receiving hospital, there should be a formal handover between the transport team and the receiving medical and nursing staff who will assume responsibility for the patient's care. Handover should include a verbal and written account of the patient's history, vital signs, therapy and significant clinical events during transport. X-rays, scans and other investigation results should be described and handed over to receiving staff.

After handover, the transport team is relieved of the duty of care to the patient, who is now in the medical care of the receiving hospital. This is an important part of the transfer of care and the status of the patient should be formally noted by the receiving team. It should be noted that the ambulance crew or air crew may not always be able to return the transfer team whence they came. The transfer team should be prepared to return home by taxi or other appropriate means and therefore thought should be given to clothing, the amount of equipment to be carried and the means of payment for the return journey.

APPENDIX

1 Departure checklist

- Do attendants have adequate competencies, experience, knowledge of case, clothing, insurance?
- Appropriate equipment and drugs?
- Batteries checked?
- Sufficient oxygen?
- Trolley available?
- Ambulance service aware or ready?
- Bed confirmed? Exact location?
- Case notes, X ray films, results, blood collected?
- Transfer chart prepared?
- Portable phone charged?
- Contact numbers known?
- Money or cards for emergencies?
- Estimated time of arrival notified?
- Return arrangements checked?
- Relatives informed?
- Patient stable, fully investigated?
- Monitoring attached and working?
- Drugs, pumps, lines rationalised and secured?
- Adequate sedation?
- Still stable after transfer to mobile equipment?
- Anything missed?

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