



AAGBI SAFETY GUIDELINE

Care of the Critically Ill Child in Irish Hospitals 2015

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Membership of the working party

Dr G Maloney	Joint Chair, Convenor of Irish Standing Committee
Dr M J White	Joint Chair
Dr K Bailey	Honorary Secretary/Honorary Treasurer of Irish Standing Committee
Dr A Bergin	Consultant Anaesthetist
Dr D Corcoran	Consultant Paediatrician
Dr I Lambert	Consultant Paediatrician
Dr D Doherty	Paediatric Intensive Care Consultant Anaesthetist

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Introduction

Recent health controversies regarding the delivery of infants outside maternity units, combined with areas of difficulty in caring for critically ill older children in general hospitals, have prompted the Irish Standing Committee of the Association of Anaesthetists of Great Britain and Ireland and the Faculty of Paediatrics, RCPI, to review some aspects of paediatric care in general hospitals, both with and without paediatric and/or maternity units. Many general anaesthetists are worried that expectations of the service they can provide to critically ill children might be too great but, on the other hand, general paediatricians do not have the skills and ongoing experience to deal with critically ill ventilated children requiring intensive care. All anaesthetists nowadays have a paediatric module in their training but, because of a lack of ongoing experience, many anaesthetists worry about losing their paediatric intensivist skills. This problem in relation to the management of the critically ill child outside a specialist paediatric hospital is not exclusive to the Republic of Ireland, and we are aware that this debate is also occurring elsewhere.

1. Neonatal resuscitation in hospitals that have no paediatric service

Several hospital sites outside Dublin provide acute medical services but do not have paediatric cover. It is not an uncommon occurrence for these units to be required to manage a newborn infant, either as a result of the mother presenting in precipitate labour and delivering on-site or when the infant is born outside the hospital and is brought in by a parent or the ambulance services. In most cases such infants may only require basic support such as feeding and temperature control. On occasion, however, these infants, as a result of prematurity or other problems, may require more significant interventions such as airway management and intravenous fluids. The absence of paediatric staff at these sites means that all initial support will be provided by general adult clinicians and nurses. All possible steps should be taken to minimise obstetric and neonatal attendances at these units; however it is important that each of the non-paediatric units have agreed protocols to guide staff when such attendances do occur and that they are equipped to provide a basic level of neonatal resuscitation and care.

It is suboptimal for doctors or nurses to be required to manage clinical problems in which they are not trained or in which they do not have recent and continuing experience. In that context it is acknowledged that all assistance provided by medical and nursing staff is in accordance with the principle of providing limited emergency medical care. Practitioners are simply required to do their best given the circumstances. It should also be acknowledged that the generally thin layers of staffing in the non-obstetric/non-paediatric units around the country mean that it is possible that, in a given situation, no anaesthetist may be available to attend an obstetric/neonatal case because they are occupied with another emergency. The following is recommended on this issue:

1.1 Minimising risk

- Health Service Executive (HSE) hospital groups with responsibility for any acute medical hospital unit without an obstetric/paediatric department should make every effort to ensure maximum public awareness as to which hospital sites do, and which do not, provide these services. This is particularly important when those who may have language difficulties are housed by the HSE near such a unit. A special effort needs to be made to ensure that these vulnerable individuals understand that if they have a pregnancy-related problem, they should proceed to the nearest designated maternity unit.
- Each hospital site without obstetric/paediatric services should have clear signage at the entrance detailing the hospital sites within the region where these services are provided.
- All ambulance and general practitioner on-call services should be given clear instructions that all acute obstetric and paediatric referrals should be directed to the appropriate hospital.

1.2 Communication needs

In the opinion of the working party, communication failure is probably the most common contribution to negative outcomes in these situations. It is incumbent on hospital management and clinicians to ensure that clear, prescriptive communication pathways have been thought through in each unit so that the non-expert has rapid access to advice from an obstetrician and/or paediatrician when an incident arises. Dedicated communication infrastructure may be needed, such as dedicated bleep systems, but each unit should address its own individual needs in this area.

1.3 Equipment and facility needs

- All non-paediatric sites should have the basic equipment required for neonatal resuscitation and stabilisation readily available for use.
- Facility to provide less than 100% oxygen and to blend oxygen is required.
- All non-paediatric sites should have a designated facility where neonatal equipment is located and where short-term emergency neonatal care can be delivered.
- Hospital management should ensure that there is adequate training of staff in neonatal resuscitation and maintenance of the necessary equipment in all non-paediatric sites especially in the emergency department where most clinical events will occur.

1.4 Guidelines for management of newborn infants and imminent deliveries presenting to a non-paediatric unit

- If the infant is active and well, transport of the mother and infant to the appropriate obstetric/paediatric unit should be arranged. Management of the infant can be discussed with the on-call consultant paediatrician prior to transfer.
- If the infant is significantly premature or is unwell, the on-call consultant anaesthetist, if available, should attend to assist with the management of the baby.
- Ongoing management of a sick infant and transport arrangements should be organised in consultation with the on-call consultant paediatrician in the designated unit.
- Ideally, transport of a sick neonate should be conducted by paediatric staff. In the absence of the National Neonatal Transport Service, which at the time may be directed to other high risk neonatal transfers and is based in Dublin, there should be capacity to provide dependable neonatal support at short notice from within each region to give a timely response. At present staffing levels, it may not always

be possible for paediatric personnel to attend such a delivery outside their own hospital. Responsibility for resourcing such a service remains with the HSE.

- If a woman presents in an advanced stage of labour, and delivery is judged to be imminent, she should be moved immediately to the designated area within the hospital where she can deliver her baby and neonatal care can be provided.
- If neonatal resuscitation is required over and above normal supportive care, the on-call consultant anaesthetist, if not otherwise involved in emergency care, should attend to assist in the resuscitation.
- The on-call consultant obstetrician and paediatrician in the regional unit should be informed as soon as possible and they will guide further management of the mother and baby and advise on transfer.

2. Neonatal resuscitation in hospitals that have a paediatric service

- Neonatal resuscitation is the responsibility of the paediatric service, which will ensure adequate availability of trained personnel at all times. All paediatric units should be in a position to ensure the on-site presence, throughout a 24 hour period, of at least one staff member capable of performing full neonatal resuscitation, in accordance with the American Academy of Pediatrics neonatal resuscitation programme.
- All paediatric personnel attending any delivery in the labour ward or theatre must have completed the American Academy of Pediatrics neonatal resuscitation programme. This should be updated at the end of every two-year period.
- The anaesthetist's responsibility during a caesarean section is towards the care of the mother.
- There will be occasions, however, when paediatric staff may require the support of anaesthetic colleagues to assist with resuscitation of an infant. If a consultant anaesthetist and a non-consultant hospital anaesthetist are present, and if the mother is stable, the consultant anaesthetist may assist in the neonatal resuscitation if so requested, provided that the consultant paediatrician has been called to attend.
- In a situation where a non-consultant doctor has not yet completed the American Academy of Paediatrics Neonatal Resuscitation course (e.g. at the beginning of January and July when staff change jobs), he/she should only attend the labour ward or theatre while accompanied by another member of staff with up-to-date neonatal resuscitation qualifications.
- Acutely ill neonatal patients from the community should be directed to the appropriate paediatric centre rather than the maternity hospitals.

3. Care of the critically ill child in hospitals without a paediatric service

There are currently ten acute general hospital sites outside Dublin providing acute medical services that do not have paediatric cover. It is not uncommon for these sites to be required to manage a critically ill child, either as a result of a traumatic injury or an acute medical condition. Every effort should be made to minimise the frequency of these attendances but when they do occur, it is important that there are clear, concise and workable guidelines for clinical management.

3.1 Minimising risk – the National Clinical Paediatric Programme recommends

- There should be consensus among all units in a region regarding the age criteria for a paediatric patient.
- HSE with responsibility for any acute medical hospital unit without a paediatric service should take robust steps to ensure maximum public awareness of which hospital sites do, and which do not, provide these services.
- Where vulnerable populations who may have language difficulties are housed by the HSE near units without paediatrics, specific, targeted communication initiatives may be needed to ensure their understanding that, if their child is acutely unwell, they should proceed to the nearest designated paediatric unit.
- Each hospital site without a paediatric service should have clear signage at the entrance detailing the hospital sites within the region where these services are provided.
- Paediatric Advanced Life Support/Advanced Paediatric Life Support (PALS/APLS) training should be available to front-line staff in non-paediatric hospitals. It is recommended that an APLS certified or suitably trained staff member should be on duty at all times.
- The ambulance service should be given clear instructions that all ill children should be taken to the nearest hospital with a paediatric service. The ambulance service should only take an ill child to a non-paediatric hospital site in extreme circumstances such as a child requiring active cardiopulmonary resuscitation or with an upper airway obstruction.
- General practitioner/GP on-call services should be given clear instructions that all acute paediatric referrals should be directed to the appropriate site.

3.2 Who is in charge?

Children with injuries/surgical problems and children with acute medical emergencies (e.g. status epilepticus, acute severe asthma, meningococcal sepsis or diabetic ketoacidosis) should continue to be placed under the care of adult clinicians prior to transfer. In units with an emergency department consultant on-site, it may be agreed locally that he/she should take primary responsibility for critically ill children. Where there is anaesthetic involvement, care should be jointly anaesthetic with the admitting clinician. The admitting clinician and/or anaesthetist should consult directly with the paediatric consultant in the receiving hospital prior to transfer.

With the expected introduction of paediatric retrieval, clinical responsibility will transfer to the Retrieval Team on departure from the referring hospital. The consultant paediatrician assumes clinical responsibility when the child arrives in the receiving hospital.

3.3 Paediatric clinical guidelines

It is the responsibility of each non-paediatric hospital unit to have a set of paediatric guidelines available which cover the management of the common paediatric emergencies. These guidelines should be facilitated by the paediatricians and other relevant consultant specialists in the region.

3.4 Paediatric resuscitation trolleys

Each non-paediatric hospital unit should have a formal paediatric resuscitation trolley set up in the A&E department. The use of the Broselow tape system is strongly recommended for the management of the child in the A&E setting.

3.5 Paediatric drug formulary

The *British National Formulary for Children* is now widely accepted as the standard paediatric formulary in Ireland. An up-to-date copy of this publication should be available in all non-paediatric A&E departments, with new editions replacing old as they are published. APLS/ PALS manuals should also be available.

The Our Lady's Children's Hospital, Crumlin, formulary and prescribing guide app is available for download from the iTunes Store for a small fee.

4. Care of the critically ill child in general hospitals with a paediatric service

Children are admitted to the hospital under the care of a paediatrician or surgeon. If they are deemed to be critically ill, the admitting consultant (paediatrician or surgeon) should consult with the anaesthetic consultant about admission to ICU or ventilated transfer to another centre as they deem appropriate. Management in ICU should be jointly anaesthetic and paediatric (or surgical). Some hospitals have high dependency areas on the paediatric unit and it may be appropriate to maintain children requiring respiratory support in this setting with appropriately trained nurses.

The AAGBI recognises the dilemma faced by general anaesthetists who feel they are working outside their usual area of practice when dealing with critically ill children. The best local expertise should be used in the management of these children. The anaesthetist is generally the most skilled person available to deal with intubation and ventilation of children outside the neonatal period.

A decision whether to transfer the child to a paediatric intensive care unit is made jointly by the local hospital clinicians and the paediatric intensivist. Referring hospitals should seek telephone advice from the tertiary paediatric intensive care unit (PICU) using the centralised telephone referral (1890-213-213) and online via <http://www.hse.ie/go/picu>. This is the only avenue of referral to PICU in the Republic of Ireland, regardless of the nature of the presenting complaint. Initial communication should be a consultant-to-consultant referral between the referring physician and receiving paediatric intensivist.

In general, critically ill children presenting outside of the tertiary paediatric centres should be resuscitated, stabilised and prepared for transfer to a PICU. Should a decision be made to admit a child to an adult ICU, the child's care should be shared by the admitting consultant and the consultant anaesthetist. Ongoing telephone advice from the paediatric intensivist should be readily available.

Care of a critically ill child in an adult ICU should only occur in exceptional circumstances. There should be local protocols and guidelines readily available for the management of mechanical ventilation, physiological monitoring, intravenous fluid and medication administration, which reflects current practice in PICU. The centralised referral line and website should be considered as a resource to guide the management of paediatric patients under these circumstances.

There are some situations when, after consultation with the tertiary unit, a critically ill child may not be transferred out, such as:

- When there is no paediatric intensive care bed available in the tertiary centre.
- When the child is too ill to transfer.
- When the outcome is deemed to be very poor, or when brainstem death has occurred. Care of a child with a neurological determination of death for the purposes of organ donation is a niche area in medicine, best done by PICUs with practice and protocols for this.

Nursing care of the critically ill child requires ICU and paediatric nursing expertise. Ideally the nurse managing the child should have PICU training. However in situations where this is not available, nursing may be provided by the joint management of an ICU nurse and a paediatric nurse. It is the responsibility of hospital management to ensure the availability of appropriately trained nursing staff to meet the needs of critically ill children. Suitable equipment should be available both in the emergency department and in the ICU.

Training: In spite of the fact that all anaesthetists undergo a paediatric module during training, the Group recognises that loss of paediatric skills is an issue.

APLS training with regular updates for all staff who may be involved with critically ill children is desirable, alongside available supranumary clinical sessions in anaesthesia and PICU available in the paediatric hospitals.

5. Inter-hospital transfer – current practice

Children undergoing treatment in general hospitals with paediatric departments may need to be referred to a specialist paediatric unit for investigation and/or treatment. The manner in which such transfer is carried out will depend on the severity of the child's condition, and the urgency of transfer.

Where the condition is serious and has already warranted admission to the ICU, common current practice is for the ICU anaesthetic staff to accompany the patient. This arrangement has the obvious benefit that specialised interventions such as mechanical ventilation are supervised by the trained staff, but at the same time takes specialist staff away from the primary admitting unit.

It is recommended that a member of the paediatric team also accompanies such critically ill patients. While the specialist interventions are quite properly the remit of the ICU doctor (almost always anaesthesia staff), the underlying condition may well be more familiar to paediatricians.

It is apparent that this joint approach, while carrying obvious benefits for the paediatric patient, is not the universally adopted practice. The AAGBI recommends a joint paediatric/ anaesthetic approach.

The AAGBI recognises that transfers will inevitably be required without direct input from the National Retrieval Service. It is recommended that the most senior personnel are available to accompany the child, both from paediatrics, anaesthetics and an experienced paediatric nurse.

6. National neonatal and paediatric retrieval services

Among consultants working in paediatrics and anaesthetics there is consensus that, for critically ill children who need to be transferred to tertiary units, a 'paediatric retrieval system' is required. This has been demonstrated to provide optimal, specialised PICU facilities during an especially hazardous phase of the child's management. This service already exists for newborns up to the age of 6 weeks (National Neonatal Transport Service) and for adults (Mobile Intensive Care Ambulance Service). Children outside these age groups are currently denied this service. The National Neonatal Transport Service is awaiting funding to extend its service to 24 hours, 7 days a week.

The need for a nationwide paediatric retrieval service has been well accepted internationally and this document should be viewed as a strong recommendation for the implementation of such a service, available 24 hours a day and 7 days a week.

The transport team should consist of members as determined by the paediatric hospital. The team requires access to road ambulance and occasionally air transport. The provision, staffing and day-to-day management of the paediatric service should be under the control of the paediatric receiving hospitals.

7. Summary

The purpose of this document is to provide guidelines to improve the quality of care of critically ill children.

The AAGBI recognises that care of critically ill infants and children outside a paediatric hospital is a problematic area for hospital management, nurses, clinicians, paediatricians and general anaesthetists.

Mothers in labour should be encouraged to attend hospitals with an on-site obstetric and paediatric service, and to bypass hospitals which do not have these services. HSE should put in place signage and communication lines to ensure that this occurs.

When, in spite of the above, a newborn baby or woman in advanced labour presents to a hospital without paediatric or obstetric departments, and if there is a need for more resuscitation of the infant than standard supportive care, the consultant anaesthetist or their delegate, and any other consultants deemed necessary, should assist in the resuscitation of the infant. Paediatricians and anaesthetists in general hospitals, when presented with a critically ill child, should arrange for jointly conducted safe and rapid transfer of the child to a PICU.

There is a need for national 7-day/24-hour neonatal and paediatric retrieval services. These services should be managed centrally by the neonatal intensive care services of tertiary maternity hospitals for critically ill neonates and the paediatric intensive care services of tertiary paediatric hospitals, to ensure prompt and safe transfer of critically ill children and newborns. Until these retrieval services become available, a joint anaesthetic/paediatric team should transfer critically ill children with advice from the receiving unit. All staff that may be involved with critically ill children should be trained in paediatric advanced life support.



THE ASSOCIATION OF ANAESTHETISTS
of Great Britain & Ireland

21 Portland Place, London, W1B 1PY
Tel: 020 7631 1650
Fax: 020 7631 4352
Email: info@aagbi.org
www.aagbi.org