The role of anaesthetists in paediatric intensive care units

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With increasing demands on anaesthetic registrars for exposure to various surgical and critical care disciplines, the usefulness of a paediatric intensive care unit (PICU) rotation was investigated. A brief overview of the experiences of anaesthetic registrars at a South African teaching hospital rotating through a PICU is presented, as well as the potential advantages for both trainees and the unit.

Life support skills are tools which we share in common with both paediatricians and surgical colleagues in the icu setting. There is however some areas where anaesthetists specialised skills can be utilized. The benefit is reciprocal, with the trainee learning as much they are willing to teach.

Trainees' are exposed to aspects of airway management such as the anatomical considerations of potentially difficult intubations and extubations in patients with congenital syndromes, upper airway obstruction and respiratory tract infections (e.g. viral croup, epiglottitis) and traumatised airways (e.g. burns victims) which occur readily in a PICU setting. Not only does the PICU present an opportunity to exploit these skills but also it provides valuable experience in a controlled environment. The anaesthetist can also provide insight into surgical considerations such as tube placement and likely post operative problems.

The anaesthetic trainees may also provide valuable input on their working knowledge of ventilation, different ventilation modes, ventilation strategies and humidification systems.

The ability to obtain vascular access (particularly central venous pressure (CVP) and arterial access) and our knowledge of the monitoring of these invasive measurement devices is a skill highly prized in the PICU.

Providing anaesthesia in the PICU allows the performance of minor procedures in the PICU without taxing an already overbooked theatre system and bypasses the logistical problems and transport associated risks which may occur with movement to and from theatre. Minor procedures that could be done include placements of central venous catheters, placement of intercostal drains, removal of drains, dressing changes in burns patients and planned extubations. Similarly anaesthetists' knowledge of perioperative analgesia as well as our practical knowledge of epidurals and regional anaesthetic skills may be vital asset within the PICU.

The PICU also exposes the trainee to new or unfamiliar drugs. (e.g. Noradrenaline and nitric oxide) providing an opportunity to transform trainee's theoretical knowledge into practice.

The exposure gained within a multidisciplinary ICU setting provides unique training opportunities for the peri-operative and post-operative considerations of the critically ill child. The registrar's acute resuscitation skills may be usefully applied in the PICU. They may also provide input regarding anaesthetic related perioperative considerations such as the duration of anaesthetics and temperature regulation. This provides the necessary bridge between the theatre and the ICU to further enhance continuation of care. The result is that the ICU ceases to become a `drop-off point' for the delivery service anaesthetist and the actual management issues become pertinent.

Registrars and junior consultants at the University of Cape Town, who had completed a registrar rotation through the multidisciplinary Red Cross Children's Hospital PICU, since its inception in 1999, were interviewed via a questionnaire regarding their experiences.13 from a potential 18 trainees replied.

The trainees' opinions as to the usefulness and shortcomings of this rotation were highlighted.

Their comments provided insight as to the aspects which they felt were of most benefit, the amount of anaesthetics given in the unit, and aspects of concern to the trainees.

Over 80% of respondents completed a rotation of more than 2 months. 100% felt that the rotation had improved their confidence in dealing with paediatric emergencies and the management of the critically ill child, while over 70% felt increased confidence in dealing with the management of upper airway obstruction and post operative cardiac management. Over 80% reported that the rotation had increased their technical skill at inserting peripheral, CVP and arterial lines. More than 70% reported an improvement of their knowledge of paediatric fluid management, the availability of auxiliary paediatric resources, sepsis control and prescribing post operative analgesia.

100% of the trainees provided anaesthesia within the unit. 70% felt more confident handling emergencies in the unit and 80% felt that it had improved their pre and post operative management of patients. 90% raised concerns as to the unfamiliar environment within the PICU, especially when managing critically ill children whose condition they did not fully understand. Some commented that the PICU was a very stressful environment "where you need to know more paediatrics than anaesthetics". The overall experience however, was enjoyed by 70% of respondents all of whom would recommend it to a colleague. Of this group interviewed, 60% considered the PICU training as an advantage to their future practice as a general anaesthetist.

The paediatric intensivists supervising the unit were also interviewed for their opinion. 5 out of 6 potential respondents replied to the set questionnaire and were asked for additional comments. Their comments provided insights into the benefits and shortcomings of having anaesthetic registrars' working in the PICU.

80% of the respondents felt that anaesthetic registrars were more technically skilled in placing CVP and arterial lines, and in intubating the critically ill child or managing the difficult airway than the average paediatric registrar rotating through the unit.

They reported that the trainees also had a better knowledge of ventilators, gas cylinders and invasive monitoring than the average paediatric registrar. All of the respondents felt that the quality of anaesthetics given was done so safely.

The registrars' most common strengths were reported to be their clinical skills at intubating (100%), obtaining vascular access (100%), the trainees' ability to recognise emergency situations, their background of icu experience and their knowledge of cardiovascular and respiratory interactions. Limitations included limitations of general paediatric knowledge, variable attitudes of trainees and inadequate knowledge of fluids and nutrition. All the respondents felt that a longer rotation within the PICU would address these shortcomings and enhance the experience of trainees.

Despite some drawbacks, both trainees and intensivists remain positive as to the potential benefits of having anaesthetists in the unit.

Tomlinson[1] reports that although previous recommendations in the United Kingdom (UK) limiting the involvement of non specialist anaesthetists and surgeons in the care of children, these recommendations failed to take into consideration the management of the critically ill child. In this situation the general anaesthetist may well be the most qualified person able to deal with airway control, ventilatory management and stabilisation of such patients before transfer to a tertiary centre. Tomlinson goes on to raise concerns regarding the potential de-skilling of general anaesthetists in district hospitals in the UK with a lack of confidence and knowledge among consultants when faced with the unexpected resuscitation of the critically ill child. This is particularly relevant to South Africa, with our ongoing focus on delivery of healthcare in rural settings and scarce availability of tertiary resources. Often the nearest tertiary paediatric ICU may be several hundred kilometres away, and the outcome of a critically injured child could well be pre-determined by the training which an anaesthetist has received. Taylor and Donnison[2] add that if the long term outcome for well managed critically ill children is so much better than for certain adult conditions requiring critical care then why are there such little emphasis on PICU training?'

The main concerns of trainees are summarised by Evans[3], "my experience is that it is a resource that is more than happy to be tapped by those that value its existence…..where unfamiliarity rather than a lack of basic skills is usually the concern to most anaesthetists"

The role of anaesthetic registrars in a PICU has been shown to have a considerable benefit to both trainees and the unit itself, where they can fulfil a vital and integral role in the management of critically ill children. This should be an asset to any tertiary anaesthetic training programme.

References

1. *Tomlinson. A. Anaesthetists and care of the critical ill child. Anaesthesia 2003;58,309-311*
2. *Taylor, Donnison. Correspondence. Anaesthesia 2003;58,1024-1025*
3. *Evans E. Correspondance. Anaesthesia 2003:58,829.*