



An Elective in Paediatric Intensive Care Medicine

The Royal Children's Hospital, Melbourne

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I was fortunate to be able to undertake my elective placement in paediatric intensive care at The Royal Children's Hospital (RCH) in Melbourne, Australia. The unit has 30 beds and cares for approximately 1700 children per year, including 700 post cardiac surgery patients, from the state of Victoria and across Australia.

Whilst on attachment, my time was split between the general and cardiac sides of the ward. I attended the daily handover and ward rounds, observing the progress and management of the patients. Between rounds, I was able to observe and assist with a number of clinical procedures such as arterial lines and intubation. I really enjoyed having an extended placement on a single unit as it allowed me to follow the children from admission through to discharge. I also had the unique opportunity to join the PIPER retrieval service and accompanied the team transferring children back to the RCH from a number of locations within the state.

Parallel to the clinical experience, I undertook a review project, examining whether nitric oxide can modify patient outcomes following cardiopulmonary bypass (CPB). Great progress in terms of patient outcomes has been made since the first successful use of CPB 55 years ago¹, with a falling 30 day mortality over the last decade despite increasing case complexity^{2,3}. However, approximately 43% of children will experience post-operative complications following cardiopulmonary bypass⁴- some of which can be attributed to the systemic inflammatory state triggered by CPB^{5,6}. Endogenous nitric oxide (NO) causes vasodilation⁷, but in states of inflammation, synthesis and release of NO has shown to be impaired⁵. Thus, has been proposed as an adjunct to CPB in order to reduce post-operative morbidity. Experimental mouse models have demonstrated decreased myocardial injury due to ischaemia reperfusion following CPB and an associated reduction in neutrophil infiltration, attenuating the inflammatory response⁸. Only two studies^{9,10} to date have been conducted in the paediatric population both indicating a cardioprotective effect associated with nitric oxide. One of these trials was conducted by the team at the RCH¹⁰, children undergoing any form of cardiac surgery were randomised with the intervention arm receiving nitric oxide through the CPB oxygenator. The proportion of children developing low cardiac output syndrome was substantially lower after receiving NO (15 v. 31%, $p = 0.007$), further highlighting the potential benefits of NO.

The elective placement offered me the opportunity to gain exposure to wide range of conditions I have not encountered before, as well as observe cutting edge interventions. I observed many emotionally challenging situations, where children had very serious injuries or illnesses, the caring and sensitive manner in which the team dealt with their families highlighted the importance of good communication. I feel I gained confidence, especially in presenting patients during ward rounds. The entire experience has definitely furthered my desire to pursue a career in paediatric intensive care medicine.

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References

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