

Elective Report - NZ Air Ambulance and Intensive Care Unit, Hastings Memorial Hospital, New Zealand

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'Get to the Chopper!' The BK117 B2 rescue helicopter sits on the helipad outside Hastings Hospital, ready to retrieve a patient from Wairoa, 133km North.

Location

Hastings Memorial Hospital is situated in the Hawkes Bay region of New Zealand, on the east coast of the North Island. Famous for its sunny climate and vineyards, Hawkes Bay is also home to a significant Maori population (24% of the local population¹) and many rural farming communities. The HB District Health Board covers a vast area, including the rural town of Wairoa 133km North, and the Chatham Islands 680km out into the South Pacific. HB Air Ambulance Service is the busiest medical flight hub in New Zealand, performing rescue missions as well as coordinating patient transfer to tertiary centres in Auckland, Wellington and Christchurch. The fleet includes 5 fixed-wing aircraft and 2 helicopters, including the one above. So far, the service has safely transported over 30,000 patients across New Zealand. A team comprising flight-nurse and ICU registrar manage airborne patients, who are brought via ED to the ICU department in Hastings Hospital. This is an 11 bed unit, providing both ICU and HDU care.

Intensive Care

My time in the hospital was divided into three parts, namely clinical experience on the ward, work on my research project, and aeromedical flights. During my time on the ICU ward, I saw a wide variety of patients, including a lady with legionella which progressed to full-blown sepsis, resulting in bilateral

below-knee amputations and the loss of 9 out of 10 digits on her hands. I followed the management of 'common' ICU presentations, including head injury, acute pancreatitis and out-of-hospital cardiac arrest. Registrar teaching included emergency airway management, AKI, dialysis fluids and in-depth ABG analysis, and student teaching covered emergency management of stroke and common prescription errors. I observed multiple central lines and tracheostomies being done, as well as helping out with day-to-day jobs on the ward.

Aeromedical Flights

We were most often called out by helicopter to Wairoa hospital, 133 km up the coast. The most memorable flight, however, was a 12 hour round trip by fixed-wing ambulance to the Chatham Islands in the South Pacific. There we picked up a young boy with appendicitis, and transported him to Christchurch for further investigation. This was memorable for several reasons. First, the Chatham Islands are incredibly remote; with a permanent population of 600, they lie 680km out into the Pacific Ocean. There is only one doctor on the island, who functions both as a GP and mans the local hospital (a 4 bed converted bungalow). Second, the mission included an exchange of goods; we provided apples and milk for the Islanders, and in exchange were given an enormous crayfish and a 500g steak of Hapuku (a rare local fish). Third, it was eye-opening to realise that though we think of New Zealand as a developed nation, there are pockets of the country where health is incredibly poor, because the populations are so remote that they don't tend to access medical care until the problem is critical. Flight medicine presents a very unique challenge to the medical team; not only must you anticipate and plan for every possible scenario (including, for example, massive blood loss in the case of a femoral aneurysm), but you must also take account of the effects of altitude on patient physiology. It was fascinating to be part of the flight team.

Research Project

Globally, more than nine people die each minute from injuries or violence², and hemorrhage is responsible for the death of 35% of these patients before they reach hospital³. Many die after the arrival of the emergency services but before they can reach a centre capable of definitive intervention. Resuscitative endovascular balloon occlusion of the aorta (REBOA) is a method of circulatory support designed to help sustain critical physiology, until definitive haemorrhage control. Pre-hospital REBOA has proved itself to be of use in London. My research project aimed to analyse data from patients with pelvic trauma, who were admitted to Hastings hospital via air ambulance, and to retrospectively assess from their parameters whether pre-hospital REBOA might have been a useful intervention to improve patient morbidity and mortality. I have collected data from the 41 patients who presented in this way between 2004-2014, and am in the process of analysing the results.

Conclusion

The elective not only met but exceeded all my expectations. It provided eye-opening experience to a diverse range of medical settings, and the challenges of an unconventional medical environment. I take away from it improved practical skills, the importance of calm teamwork in an emergency environment, and the very definite possibility of a career in aeromedical medicine. I thank the Association for providing financial support for such a wonderful experience.

1. NZ National Census 2006

2. World Health Organization (WHO). Injuries and violence: the facts. Geneva, Switzerland: WHO; 2010.

3. Kauvar, D.S., Lefering, R., and Wade, C.E. (2006) Impact of hemorrhage on trauma outcome: an overview of epidemiology, clinical presentations, and therapeutic considerations. *J Trauma* 60, S3-1