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Abstract

Going into my elective period I had a number of aims and objectives. As this was my last rotation as an undergraduate I felt it was important to complete my elective in an environment that would allow me to practice the clinical skills and knowledge that I have developed during the last 5 years. I saw this as an opportunity to prepare myself for my practice as a Junior House Officer and to experience healthcare delivery in a different setting. I also felt that as I entered my elective at the end of my undergraduate studies I would have a lot to offer to the teams working in the hospital I went to.

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Going into my elective period I had a number of aims and objectives. As this was my last rotation as an undergraduate I felt it was important to complete my elective in an environment that would allow me to practice the clinical skills and knowledge that I have developed during the last 5 years. I saw this as an opportunity to prepare myself for my practice as a Junior House Officer and to experience healthcare delivery in a different setting. I also felt that as I entered my elective at the end of my undergraduate studies I would have a lot to offer to the teams working in the hospital I went to.

Choice of elective

I chose to complete my elective in Australia for a number of reasons. Firstly, I felt I would gain most experience in an English-speaking environment, as I do not speak any foreign languages sufficiently well to practice medicine. Secondly, as a western society I felt the health care system would be similar in many respects to that in the UK. Thus I would see similar medical problems to those of a Junior House Officer, which would be extremely useful in my fast-approaching finals. Finally Australia has always been a place I have wanted to visit having heard many favorable reports from friends and other doctors. Consequently I wished to experience its culture and way of life for myself. Although described in many travel books as the "most isolated capital city in the World," I decided to base myself in Perth, Western Australia in the specialties of General medicine and Intensive Care. Two main hospitals exist within Perth, the Royal Perth Hospital (RPH) and the Sir Charles Gardiner Hospital. Both of these are teaching hospitals attached to the University of Western Australia (UWA) offering elective places. The city seemed to offer a diverse range of culture and entertainment and there was plenty of scope for exploring outside of the city. In addition Western Australia has some of the best autumnal weather. I therefore felt this would be an ideal environment to achieve my objectives and was successful in my application to the RPH.

Choice of Specialties

I shared my elective time between the specialties of general medicine and intensive care. I particularly wanted to do general medicine as I was keen to extend my experience in a broad range of conditions and clinical areas. Furthermore during my clinical attachments I especially enjoyed acute and general medicine. Although intensive care was not initially one of my first choice specialties, I felt that time spent in ICU offered experience in the management and continued care of acutely unwell patients and their families. I hoped to learn more about the practical procedures carried out in the unit, such as central line insertion, ventilation and other commonly used interventions. I also thought this area would expose me to a broad spectrum of patients, with a wide range of medical and surgical problems at various stages of their management, which would prove useful in my work as a House Officer.

Preparations

In order to be allowed passage into Australia I had to apply for a business visa specifically designed for medical students completing electives. This involved amongst other things having a chest x-ray to rule out tuberculosis. In addition, UWA required evidence of immunity to tuberculosis, hepatitis B, rubella, measles, mumps and varicella zoster. On arrival in Perth testing for methicillin resistant staphylococcus aureus would also be required at the department of occupational health. This highlights the importance of the vertical theme of public health (*Vertical Themes are aspects of the Edinburgh curriculum that run through all 5 years Ed.*), in ensuring my health and well-being, as well as that of my patients and colleagues. No

further vaccinations were required for travel to Australia. In addition I acquired adequate travel insurance to cover any medical expenses incurred whilst away, as well as to guard against theft or change in travel arrangements. The UWA also advised me that it was sensible to ensure I had adequate indemnity cover for seeing patients in the hospital. Before leaving it was important to make sure that I had given my family and the medical faculty contact details so that I could be contacted should the need arise.

The Health Care System

I found the health care system in Australia to be very similar to that of the UK in terms of type of conditions seen and healthcare delivery. There were however some differences between the NHS and Australian systems. In Australia a publicly funded scheme called Medicare exists which entitles all residents to care at public hospitals like RPH. As in the UK, the resources of these public hospitals are stretched and therefore many patients have private health care insurance to supplement their Medicare. This means that they are able to attend hospitals such as the Sir Charles Gardiner which offer more comfortable surroundings, faster access to patient-requested surgeons and physicians, and the opportunity to have non-essential procedures performed. During my time in Australia I felt that both public and private patients received investigations such as computed tomography very quickly and more readily compared to the UK. The hospital ran efficiently but at times it could be seen that staff and resources were stretched to their limits, as is often the case in the UK.

The Hospital

RPH is an 855 bed hospital providing a comprehensive range of medical and surgical services for adults¹. Areas of special expertise include: emergency services (RPH is the busiest trauma centre in Western Australia), coronary angioplasty, cardiothoracic surgery, stroke treatment, haematology, interventional neuro-radiology and burns¹. RPH admits over 67,000 patients annually, with 44,000 attendances to the accidents and emergency department¹. RPH is one of two large teaching hospitals in Western Australia, which together cater for a state-wide population of 1.8 million people². 1.4 million people live in Perth, with the rest distributed throughout a state larger than most European countries². Outlying rural hospitals are in place to cater for the rural communities. These however, are only able to offer basic services. Those patients requiring specialist help or input in their management were therefore transferred to the appropriate Perth-based hospital. The vast distances involved in transporting these patients meant that a flying doctors scheme was in operation for the retrieval and transport of these patients. I saw a number of patients who had been transported hundreds of kilometres to the hospital. This was a big difference from the UK, where distances to a hospital are no where near as vast. Whilst at RPH I was able to take part in the teaching program followed by the fifth year medical students at UWA. This involved attending tutorials, bed-side training sessions and some problem-based learning sessions. I found a major emphasis was placed on teaching at the hospital. There was a high level of involvement from the consultants, registrars and house officers in respect to undergraduate teaching, with medical students seen as an important part of the clinical team. Well-established post-graduate teaching programs were also in place.

Western Australia has a large number of indigenous aboriginals. These individuals frequently move from place to place in tribal and family groups and therefore often do not have a general practitioner. They also have minimal incomes and do not have private health insurance. As RPH was

a wholly public hospital a significant proportion of the patients attending were of aboriginal extraction. These patients often presented with poorly controlled medical conditions and their culture and beliefs often made their management an interesting challenge.

Clinical Experience

The medical and surgical problems seen at RPH were akin to those seen in Edinburgh. Common conditions seen in the general medicine setting included: diabetes, ischaemic heart disease, cerebrovascular disease, chronic obstructive pulmonary disease, pneumonia and deep vein thromboses with resultant pulmonary embolisms. In ICU a wide range of patients were seen with common presentations being multiple trauma following road traffic accidents, sepsis with multi-organ failure and as RPH was the neurology centre for Perth, I saw a large number of patients admitted following a subarachnoid haemorrhage. The ICU also received post-operative surgical patients with common procedures being coronary artery bypass grafting, abdominal aortic aneurysm repair and the removal of brain tumors. During my time in ICU I saw numerous procedures such as central line insertion and percutaneous tracheotomies.

Case Study One

During my time in general medicine I encountered the particularly interesting case of FB. FB was a 28 year old, aboriginal gentleman who presented to the emergency room of RPH with marked shortness of breath, high fever (39°C), severe headache and right, upper quadrant abdominal pain. On examination FB looked very unwell, was tachypnoeic with a respiratory rate of 30 breaths per minute, with evidence of intercostals in-drawing and use of accessory muscles of respiration. On auscultation of the chest there was reduced air entry bilaterally, with bilateral inspiratory and expiratory crackles.

Initial investigation revealed FB to be in acute renal failure with a creatinine of 300µmol/L and a urea of 70mmol/L. Liver function tests revealed increased levels of aspartate transaminase, alkaline phosphatase and alanine aminotransferase. A chest x-ray revealed multiple opacities throughout both lung fields.

Differentials considered were those of a viral/mycoplasmal/bacterial pneumonia, viral hepatitis. Delving further into FB's history revealed that he had recently been out hunting Kangaroos for his family and had prepared the animal carcasses. Amongst the doctors working at RPH this immediately raised the question of could this be Q-fever. Serology for this was therefore sent and a positive result was returned.

FB was immediately given oxygen, and support was instigated in the form of renal dialysis. On diagnosis of Q-fever, tetracycline therapy was started.

Q-Fever is caused by a rickettsia-like organism, *Coxiella Burnetii*^{3,4,5}. It is transmitted by inhalation of contaminated dust or droplets from infected carcasses, as seen with FB. It was interesting to see this unusual condition, which I certainly would never have considered in my differential list. In 2002 Western Australia had 21 cases of Q-fever⁴. Q-fever is a notifiable disease in Australia and therefore it was important to notify the consultant in public health so that follow-up and monitoring of FB and his contacts could occur. Treatment of Q-fever can suppress symptoms and shorten the clinical course, but it does not always eradicate the infection. Hence it was vital that FB was adequately followed up to ensure that he did not go on to develop chronic Q-fever. In many of the aboriginal patients seen at RPH this can prove very difficult due to the way of life and the culture they follow. Aboriginal communities often move from place-to-place to find new food supplies and settlements. This makes follow-up and compliance with therapy very difficult at times. Good communication skills are paramount in this situation to ensure that the need for follow-up is explained, in a way that the person, who has often not attended formal education, can understand.

Case Study Two

Another thought-provoking case was that of GR, a 17-year old male admitted to ICU following a high-speed motor vehicle accident in which he was the front seat passenger. At the scene of the crash GR was GCS 4 and his extraction from the car was prolonged – taking 45 minutes. He

arrived at the hospital still GSC 4 and was sedated. An endotracheal tube was passed and he was ventilated and transferred to ICU. Initial assessment and investigations revealed GR to have extensive injuries including a large subarachnoid haemorrhage, 2 broken ribs on the right with resultant pneumothorax and multiple fractures to his lower limbs. He went to theatre for evacuation of the subarachnoid haemorrhage and insertion of a ventricular drain, a chest drain and fixation of his fractures.

Over the next few days numerous therapies were tried to keep his intracranial pressure (ICP) low but on day 7 his ICP rose uncontrollably and his pupils became fixed and dilated. Staff felt that GR was brain dead and wanted to perform brain stem testing. GR had however been given Thiopentone during his management. This drug has a long half-life and therefore would take a number of days to be cleared from his body. Criteria for brain death could therefore not be met until sufficient time had passed for the drug to be eliminated. The ICU doctors therefore sought permission from GR's family to perform cerebral angiography. This was done and confirmed no cerebral blood flow. Treatment was withdrawn and GR passed away in the arms of his family.

This case had numerous learning points for me. It illustrates well the need for a good understanding of the pharmacology of the drugs we give to patients, particularly when dealing with brain death. We must be sure that the decision is absolutely correct. The case also made me think about the ethical issues surrounding the withdrawal of treatment. It was very interesting to see how the staff in the ICU worked as a team to support the family during this time. Good communication skills were required in breaking the bad news to the family, and providing adequate explanation of what needed to be done. Having been through this case I feel better equipped in dealing with these emotional issues and hope that with time I too will be able to help families through these difficult times.

Final Reflections

I really enjoyed my time at RPH. I was made to feel a part of the health care team and felt confident in the clinical setting. I was also able to apply the key skills, such as IV cannulation and arterial blood sampling, and fundamental knowledge that I have acquired throughout my undergraduate training. Being able to shadow the UWA students was definitely beneficial. It allowed for revision of key topics and enabled me to see patients with other students watching so that we could then feed back to each other. This may prove very useful going in to my summer exams and I am pleased that I took time out to do this. I think my choice of elective destination suited me very well and I feel that I have achieved my objectives. Australia is a country I could see myself working in at some point in the future. The health care system is very similar, as are the clinical problems in general medicine, which was ideal I feel at this stage of my career. ICU reconfirmed for me the importance of multi-disciplinary care for patients and revised the important principles of caring for critically ill patients, something that will come in useful next year. My elective has taught me the importance of seeing as many patients as possible and that medicine is a career of life-long learning. As I near the end of my undergraduate training I hope to use my PRHO year to build confidence in the duties and responsibilities of a doctor, whilst striving to meet the expected standards in competence of care and conduct.

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