

## **ELECTIVE (SSC5c) REPORT (1200 words)**

A report that addresses the above four objectives should be written below. Your Elective supervisor will assess this.

**1. I undertook my elective placement at the Ronald Reagan Hospital in Los Angeles and worked as part of the neurosurgical team. Whilst there, I met a huge variety of patients and witnessed procedures and operations covering almost all aspects of neurosurgery. Based on personal interest, the majority of my time was spent observing the management of patients with brain tumours, both malignant and benign. A comprehensive list of what I saw includes: meningiomas, gliomas including astrocytomas/oligodendrocytomas, acoustic neuromas, DNET (dysembryoplastic neuroepithelial tumours), PNET (primitive neuroectodermal tumours) and cortical/subcortical tubers (from tuberous sclerosis). I was relatively familiar with meningeal and glial based tumours but had never heard of, nor seen a DNET or PNET whilst on placement in London and so this particularly stands out as something completely new that I was able to learn about.**

**Other than cranial neoplasms, I also witnessed a considerable amount of neurovascular surgery including the repair of cranial aneurysms, arteriovenous malformations and arteriovenous fistulae which I had not previously witnessed at the Royal London Hospital. As this is a subspecialty that in the UK is now largely managed by the interventional neuroradiologists it was extremely educational to witness the open approach to aneurysm clipping and to see how this meticulous microsurgery is performed.**

**The other aspect of neurovascular surgery which is a prominent part of neurosurgery in Los Angeles is that of cranial haemorrhage in the context of trauma. On this subject, I learnt a considerable amount about extradural, subdural and subarachnoid haemorrhages and witnessed several times how haemorrhages are evacuated and managed thereafter in the Intensive Care Unit. This aspect of neurosurgery is very similar between the Ronald Reagan Hospital and the Royal London Hospital – both are maximum level trauma centres within prime inner city locations and thus deal with high levels of trauma and are responsible for managing the most seriously injured of patients. The high level of complex trauma patients is increased by the use of the Air Ambulance at both hospitals.**

**One contrast between the Ronald Reagan Hospital and the Royal London Hospital was the amount of pituitary surgery I saw. Ronald Reagan hospital has a specialised pituitary neurosurgeon who oversees all of the trans-sphenoidal endoscopic surgery of pituitary micro/macroadenomas. My experience in London has been that this type of surgery is typically managed by the endocrine surgical department rather than neurosurgery.**

**Overall, I think that the pattern of neurosurgical disease is very similar between here and Los Angeles, simply by virtue of both being large, densely populated cities in the developed world with a reasonably similar demographic population and with similar resources available. However I think that the main difference is the division of teams and sub-specialties and the determination of which specialty is best suited to managing the particular medical condition.**

2. I had originally planned on identifying how accessible treatment is in terms of financial viability but as it turned out, it is very difficult to identify from a medical student point of view who is able/unable to receive treatment. In hindsight, I think this issue would be easier to address if working in A&E - the universal rule (as far as I understood it) is that no-one is denied emergency treatment but cannot be referred on for subsequent (non-life-threatening) treatment without appropriate insurance. Most of the patients fell into either of these two categories (emergency treatment or referred treatment) and thus I wasn't acutely aware of people being turned away due to lack of insurance. The only time I was vaguely aware of financial issues was during clinic appointments, most notably when the neurosurgical team felt it would be prudent to gain a second opinion (neurologist, endocrinologist etc) and had to enquire whether the patient had appropriate insurance to do so.

However, without focusing on the topic of personal health insurance on a patient specific basis, there were many occasions where I noticed a profound difference by being part of a privately-funded, and therefore partially money-driven collective rather than a state-funded health system. Unsurprisingly, the efficiency and application of services was, on the whole, considerably quicker. There are a few examples of this which immediately spring to mind.

One which stands out in particular is that it appears to be a routine procedure to obtain, deliver and receive the results of pathology specimens intra-operatively. In the NHS I have only ever seen pathology results obtained long after the operation has finished. I found this concept particularly interesting – if we were to be able to incorporate this in to the NHS we would require many extra resources and staff, BUT if these extra outgoings were possible initially then we might actually maximise efficiency in the long-run as this intra-operative result may change the course of the operation. One example is that when removing a tumour you can immediately identify the type of tumour and determine how aggressive the excision needs to be to prevent further operations which not only maximises efficiency for the department but is considerably less traumatic for the patient.

3. When diagnosing/managing brain tumours, the major difference to me seemed that there were considerably less biopsies performed in Ronald Reagan compared to the Royal London – the majority of cases were managed with complete excision at the time of surgery. As mentioned previously, this may be due to the ability to obtain intra-operative diagnostic specimens which then allows you to determine the type of tumour immediately and proceed accordingly with a complete excision if necessary. In the NHS I have seen biopsies performed using the Stealth guided stereotactic system many times but I only saw this once in the US and they seemed more unfamiliar with the equipment used for it.

The UK and the US are very similar however in their use of stereotactics for brain tumour resection. At the Royal London we exclusively use the STEALTH system whereas Ronald Reagan use BrainLab. From what I can gather, the BrainLab system is more advanced with an extensive brain mapping function allowing you to outline the important structures within the brain such as the primary motor strip and Broca's/Wernicke's to ensure these are not damaged during the operation. If this is a feature available on the STEALTH system then I have never seen it used. I also saw intra-operative functional brain mapping using plates placed directly on specific brain structures which I had not previously seen at the Royal London. One such operation utilised this technology in conjunction with an awake craniotomy which was a particular highlight of my time spent in theatre.

4. In terms of opportunities to meet patients and formulate my own management plans based on identifying specific diagnoses, I found that this was best catered for during my time in clinic. This gave me the chance to see my own patients, perform a full history and examination, review the appropriate imaging and discuss with the consultant what I believed the next appropriate step was. One such instance which stands out was being able to diagnose a patient with a profound case of Cushing's syndrome secondary to a massive pituitary macroadenoma which subsequently required immediate admission to the hospital. I found this particularly useful as I was the first clinician to see him and I was therefore able to identify this syndrome without a prior diagnosis having been made by someone else.