ELECTIVE (SSC5a) REPORT (1200 words)

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

For the second part of my Christina Swain Trauma Fellowship, I spent 6 weeks at St. Joseph's Hospital and Medical Center (SJHMC) in Phoenix, Arizona. Traumatic injuries represent a huge burden on healthcare within the US, it is the leading cause of mortality up to the age of 45, with around 200,000 deaths due to unintentional injury each year, morbidity/mortality related to traumatic injury has only increased nationally over the last few years.[1,2]

Arizona itself reflects this national trend, with its trauma centers treating 796 per 100,000 every year.[1] The mechanism of traumatic injuries in Arizona consist chiefly of falls, motor vehicle collisions (occupant) with a small proportion of firearm related injuries. Although there is a higher incidence of trauma in Arizona compared to the UK, there is a similarity in the change of mechanism over the last decade, with falls and elderly trauma quickly becoming the largest contributor of burden in both the US and the UK.[2] Despite firearm-related injuries being a relatively small proportion of the trauma burden in the US, it is vastly more frequent than in the UK, where even senior ED clinicians can go whole careers without treating a gunshot wound.

The system of trauma care within the United States originates from a shift in the 1970's to designated tiers of trauma centers ranging from 1-4 (SJHMC being a level one trauma care).[3] This mirrors the comparably later changes to trauma care in the UK in 2012 to Major Trauma Networks, both changes demonstrated a morbidity/mortality benefit.[4] The efficacy of the US trauma nexus has its limits however, with criticism of its 'incomplete' nature allowing poorer outcomes in more rural/difficult to access areas of various states.[3]

In terms of my personal experience, the hours I worked were much higher than even the most work intensive health care placements I have been on, with the typical day being minimum 6am-6pm. Managing physical and mental fatigue was a skill I had to learn rapidly. I frequently opted to take one or two 24-hour call shifts per week, this was to ensure I could get the maximum hands on experience during times of high volume of injury. The nature of the placement meant I had very little downtime, and what I did have was often spent reading articles, papers and listening to podcasts about trauma; as such I treated this elective as a time to fully immerse myself in a trauma 'retreat'.

Most of my time was spent in the designated Trauma resuscitation area, consisting of 6 fully equipped bays. From here, various tiers of trauma (e.g. Code Yellow/Red) were brought in by the pre-hospital team (generally the local fire service). In comparison to the practice I'm used to at the Royal London (usually via paramedics/prehospital clinicians), the handover was more succinct, unstructured and delivered in a more uncontrolled milieu. The subsequent assessment by the team continued this theme, the bay felt a lot more crowded, with all members of the 'pit-stop' focused on completing their individual tasks (lines, primary survey, adjuncts etc). After reflecting on this with one of the trauma surgeon attendings, I began to appreciate this crowded resuscitation as a function of a fall in patient volume at St. Josephs, this could lead to a less slick team due to their new relative lack of exposure. It took a while to adjust to this way of running a trauma call, but after a few days I was able to integrate myself in to the team, whether that be helping to expose the patient, helping with blood samples, conducting the primary/secondary survey and/or transferring the patient to scan/OR, I even managed to build my way up to place arterial lines and assist with chest tube placement. Beyond the initial assessment, I had plenty of opportunity to improve my wound care skills, both in a temporizing sense with applying a variety of temporary dressings, but also more definitively with countless stapling and suturing.

The injuries I saw on a daily basis reflected the epidemiology described above, elderly 'ground level falls' were a frequent occurrence (as in the UK) but by far the most frequent mechanism was a form of motor vehicle collision or vehicle vs pedestrian. This reason became obvious upon thinking back to my view out of the taxi window after landing in Phoenix, with wide, pedestrian-unfriendly roads dominating the local landscape.

One particular patient stuck out amongst the rest, they arrived in extremis during one of my 24 hour on-call shifts. They had sustained a gunshot wound to the chest, and required both an anterolateral thoracotomy

and a median sternotomy in the OR to control the bleeding. He was subsequently monitored on the ICU and placed on ECMO. The rapid, pressured decision making involved in the emergent phases, combined with the extremes of surgical practice/physiology was a fantastic opportunity to learn from. His later stint on ECMO gave me an opportunity to further gain experience at the pinnacle of supportive critical care.

Outside of the less predictable trauma calls, my time spent on the trauma service was spent assessing Trauma ICU patients and then presenting these on 'rounds'. Regularly assessing these patients meant I gained practical experience with ventilators, various drains and tubes as well as developing management plans for a multitude of organ systems, often whilst considering their subsequent interplay.

In order to maximize our hands-on experience, Mat and I alternated our time between Trauma and the Acute surgery service. In reality, there was much overlap in terms of staffing between the two, so the trauma experience was not hampered by much. Following the surgical team gave me plenty of opportunities to assist in a variety of operations in the OR, learning myriad surgical skills along the way such as maintaining sterility, suturing and handling various surgical/laparoscopic instruments.

Interrogating the reasoning behind clinical interventions in the trauma bay led me to delve into the research behind smaller vs larger bore chest tubes for draining haemothorax, I was then given the opportunity to present this work at an internal conference, allowing me to further discuss the threshold for practice change in trauma, and the institutional barriers it entails.

This elective has not only given me the opportunity to experience healthcare provision in a different country, but it has granted me the privilege to assist in providing care to the patients at the extremes of injury and physiology. It has solidified my intention to work in the field of trauma via Emergency Medicine, and I will aim to translate the experience gained here to improve myself as a future trauma clinician in the UK.

References:

1. Trauma Facts [Internet]. The American Association for the Surgery of Trauma . [cited 2022 May24]. Available from: https://www.aast.org/resources/trauma-facts
2. Underlying Cause of Death, 1999-2020 Request Deaths occurring through 2020 [Internet]. Available from: https://wonder.cdc.gov/controller/datarequest/D76
3. Part 1: A brief history of trauma systems [Internet]. ACS. [cited 2022 May 25]. Available from: https://www.facs.org/quality-programs/trauma/systems/trauma-series/part-i/
4. Crawford SM. Changing the system — major trauma patients and their outcomes in the NHS (England) 2008–17. EClinicalMedicine. 2018;4-5:3.