

## **ELECTIVE (SSC5b) REPORT (1200 words)**

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

### **1. Describe how trauma is managed at the Royal London Hospital, the busiest trauma centre in Europe.**

**Discuss how any recent knowledge based on the experience of trauma experts at RLH could be used to improve outcomes in trauma care in developing countries.**

The Royal London Hospital (RLH) is a leading UK specialist centre in trauma. Emergency doctors at RLH deal daily with serious injuries caused by road traffic accidents, falls, fire and violent crime. Whilst on my elective I had the opportunity to observe and occasionally become involved in the management of a range of trauma patients presenting in Resus. This included patients with multiple falls injuries, stab-victims, head injuries (including a domestic violence case) and several RTAs involving motorcyclists/cyclists.

The focus of this elective was ultrasound in the ED, so I consider how the FAST (Focused Assessment with Sonography for Trauma) scan might be used to improve trauma outcomes in developing countries. Blunt thoracoabdominal trauma is a common presentation in the ED. FAST is a rapid and noninvasive bedside test which assesses for free intraperitoneal fluid (i.e. blood) resulting from injury to the peritoneal, pleural and pericardial cavities. FAST uses ultrasound to visualise four areas where blood tends to pool in trauma: the hepatorenal recess, the perisplenic angle, the subxiphoid pericardial window and the suprapubic window. It can also be extended to assess for pneumothorax and haemothorax. [1]

In resource-limited environments in the developing world, FAST can be used to speed-up decisions about which patients need surgery and thus decrease the time to surgical intervention. One study in a rural hospital in South Africa (where there is limited access to CT) demonstrated how FAST can play an important role in determining which trauma patients to transfer externally for specialist input. FAST can also be used for rapid triage of multiple injured patients in mass casualty situations in the third world. For example, it has been used in natural disaster scenarios like the 2004 tsunami in Indonesia or the Haiti earthquake in 2010. [2]

### **2. Consider how Point of Care Ultrasound Scanning (POCUS) is used in major trauma centres in the U.K.**

**and compare this to other countries in the developed world.**

In the UK, POCUS plays an integral role in diagnosis of patients presenting in the Emergency Department. Since 2010, proficiency in POCUS has been a mandatory element of core training in Emergency Medicine. There are four clinical applications of ultrasound that emergency doctors must be trained in, as follows [3]:

- **Focused Assessment with Sonography in Trauma**
- **Assessment of the Abdominal Aorta for Aneurysm**
- **Focused Echocardiography in Life Support**
- **Ultrasound Guided Vascular Access**

The United States and Canada have supported the use of POCUS in Emergency Medicine since the 1990s and it is now a standard part of EM training. The American College of Emergency Medicine requires ultrasound competence in some of the following main areas: trauma, pregnancy, AAA, cardiac echo, biliary system, urinary tract and DVT. POCUS is used extensively in EM throughout European countries. However, the current scope of POCUS in EM is country-specific and no central body exists to govern its use. A commentary on this subject is therefore beyond the scope of this essay [4].

**3. Explore the current role of Point of Care Ultrasound (POCUS) In the emergency department and the potential for its use in the primary care setting.**

I have already considered the role of POCUS in the ED, so will now look at its potential for use in primary care. Primary care involves dealing with an increasingly aging population. Ultrasound can be used effectively to diagnose and manage many of the diseases or conditions that affect the elderly, including:

- The evaluation of residual volume in the bladder in the context of urinary incontinence;
- Screening for abdominal aortic aneurysm;
- The evaluation of cardiac morphology and function in patients with heart failure or valve problems;
- Evaluation of prostate shape and size, as well as ongoing monitoring in response to medical treatment.

A systematic review on the subject in 2012 on the subject concluded that POCUS “holds great promise in primary care practices and in geriatrics. It appears that portable and handheld ultrasound machines are becoming the “stethoscopes of the future” and could easily be incorporated into the physical examination of patients. However, little is known about the appropriate application of this technology for clinical care in older adults” [5].

More recently, in 2016 a Danish study sought to examine and compare the use of POCUS in general practice in different European countries [6]. It found significant differences between countries in the clinical application of POCUS in primary care, as well as in how it was regulated. Key persons with knowledge on POCUS in primary care were identified in 12 European countries, including Denmark, Germany, the Netherlands, Sweden and Scotland (notably, no such person was identified in England). Each was provided with a questionnaire, which formed the basis of the following study results:

- Eight of the countries have national societies for POCUS in general practice;
- The proportion of GPs that use POCUS in each country varies considerably: e.g. only 1% in Denmark, 45% in Germany and 67% in Greenland;
- Nine of the countries have specific educational programmes on the use of ultrasound in primary care;
- The main clinical use of POCUS in primary care was for patients with obstetric, gynaecological, musculoskeletal, abdominal, urogenital, cardiac and vascular issues.

A systematic review of all of the literature on POCUS in general practice which commenced in April 2016 is ongoing [7]. This sets out to assess, amongst other things, which conditions POCUS is used for, what

training GPs do in POCUS, patient satisfaction with and financial implications of using POCUS in primary care. This will be an interesting read.

4. Expand diagnostic skills by learning how to use and interpret ultrasound scanning in the emergency department setting.

During my elective, I had the opportunity to attend multiple teaching sessions on the use of ultrasound in the emergency department. This included multiple morning ultrasound teaching sessions on subjects including cardiac echo, FAST scanning, ultrasound for DVT, lung pathology, as well as a practical session on kidney and gallbladder disease. In addition to this, I was fortunate enough to attend a day course on ultrasound in shock run by Prof Tim Harris for emergency trainees.

I also did a session in the ultrasound department with a radiologist who taught me about Duplex ultrasound for DVT scanning in detail, and allowed me to perform the limited compression ultrasound test on two patients. This formed part of my research for the presentation I prepared on how to diagnose DVT using ultrasound. Whilst this project proved to be very time-consuming, it forced me to understand research on the topic in detail and was a great opportunity to practice the skill of giving a 20 minute presentation. It was also a useful refresher on how to carry out a critical appraisal of a research paper.

## References

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2. Sippel et al. Review article: Use of ultrasound in the developing world. International Journal of Emergency Medicine 2011, 4:72 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3285529/>
3. The Royal College of Emergency Medicine webpage on Ultrasound Training. [http://www.rcem.ac.uk/RCEM/Exams\\_Training/UK\\_Trainees/Ultrasound\\_Training/RCEM/Exams\\_Training/UK\\_Trainees/Ultrasound\\_Training.aspx?hkey=b0565712-6409-49b9-96c3-eafbda02a404](http://www.rcem.ac.uk/RCEM/Exams_Training/UK_Trainees/Ultrasound_Training/RCEM/Exams_Training/UK_Trainees/Ultrasound_Training.aspx?hkey=b0565712-6409-49b9-96c3-eafbda02a404)
4. Whitson et al. Ultrasonography in the emergency department. Critical Care 2016 20:227 <https://ccforum.biomedcentral.com/articles/10.1186/s13054-016-1399-x>
5. Schumacher et al. Point of Care Ultrasound by Primary Care Physicians and Geriatricians: Old Adults, New Technology, Potential Benefits and Burdens. Journal of Gerontology and Geriatric Research 2012, V1, Issue 1
6. Mengel-Jorgensen et al. Variation in the use of point-of-care ultrasound in general practice in various European countries. Results of a survey among experts. European Journal of General Practice 2016 Vol. 22 No. 4, 274-277 <http://dx.doi.org/10.1080/13814788.2016.1211105>
7. Camilla Aakjær Andersen, Sinead Holden, Jonathan Vela, Michael Skovdal Rathleff, Martin Bach Jensen. Point-of-care ultrasound in general practice: a systematic review. PROSPERO 2016:CRD42016038302 Available from [http://www.crd.york.ac.uk/PROSPERO/display\\_record.asp?ID=CRD42016038302](http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42016038302)