

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

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

**Objective 1: Describe the pattern of disease/illness in the population within Liverpool and compare this to the rest of the UK and other countries.**

Based on The Index of Multiple Deprivation 2015, Liverpool is ranked as England's 4th most deprived local authority area, 3rd most deprived on the Health Deprivation & Disability domain and the Liverpool City Region specifically is ranked as the most deprived City Region in England based on Income, Employment and Health & Disability. (1)

Particularly relevant to forensic pathology, the Liverpool City Region ranks 7th most deprived on the Crime domain, whereas the overall Liverpool area ranks 40th. (1)

The prevalence of cardiovascular conditions (2014-15) in Liverpool are almost the same as those in England, yet the premature mortality (under 75 years) from cardiovascular conditions between 2013-15 were 31% higher in Liverpool than England. Infant and Perinatal mortality from 2012-14 in Liverpool was 16% higher overall than in England (2).

Chronic obstructive pulmonary disease was 60% more prevalent in Liverpool than the England average. Incidence of lung cancer between 2011-13 in Liverpool was double that of England overall (1.8x and 2.1x for men and women respectively). Premature mortality from respiratory diseases in Liverpool from 2013-15 was double that of England, the majority of which could be statistically attributed to smoking.

Although Liverpool has significant health deprivation and commensurate rates of premature mortality when compared to the rest of England, when viewed on a global context Liverpool scores highly overall.

Worldwide, leading causes of mortality include ischaemic heart disease, stroke and cancer. In the UK, the leading cause of mortality in women is now dementia, accountable for 15.2% of female deaths in 2015. (3) Ischaemic heart disease is still the leading causes of mortality in men as of 2015. Whereas all types of cancer as a group is the most common cause of mortality overall. (3)

**Objective 2: Describe the provision of histopathology and forensic pathology services in Liverpool and the UK and compare this with other countries.**

Histopathology is responsible for between 70-80% of all healthcare diagnoses and is therefore central to the efficient running of the health service overall. Surgical specimens taken during a procedure are examined by a Histopathologist within days if the sample is preserved in formalin, or within 20 minutes if frozen in liquid nitrogen, this gives very fast feedback to the surgeon as to or whether or not they need resection, or whether their resection margins are clear.

Forensic pathology provision in the UK is varied among different member countries. In Scotland, the Procurator Fiscal has jurisdiction over the examination of the deceased/human remains, where an external examination of the body/remains can be deemed sufficient, given the context of the circumstances surrounding the death, to decide whether a death is suspicious or not. In turn

mandating further examination by a forensic pathologist or to declare a cause of death with or without the aid of a Histopathologist.

In England, HM Coroner services have jurisdiction and will request a post-mortem examination be carried out in all sudden/unexpected deaths, especially deaths in the community which are more likely to be the result of foul play than deaths in hospital. The police have a vital role is discerning whether the circumstances surrounding the death are to be treated as suspicious or not. If a suspicious finding is uncovered at the PM examination or within the history and circumstances surround the death, then a Consultant Forensic Pathologist on the Home Office register is requested to perform a very detailed examination in collaboration with the local Police services. Many Home Office Pathologists work independently of the NHS, in local groups of at least 3 consultants. However other consultants may work within the NHS, partake in research and registrar training and may also perform PM examinations on behalf of the Coroner.

**Objective 3: Build on understanding of gross anatomy, and be introduced to post mortem examinations, attending crime scenes, and recognition of gross pathology and be able to consider differential diagnoses for cause of death.**

The forensic registrars have shown me many sets of crime scene photos and particular presentations of forensic findings. I have developed some familiarity in listing differential diagnoses for causes of death, for example being able to recognize some concerning features of a ligature (absence of a gap, horizontal lying ligature, excoriation marks etc), discerning bruises from hypostatic changes by incision, and being able to recognize post-mortem signs of asphyxia, drowning, hypothermia, traumatic brain injury, pulmonary thrombo-embolism and coronary thrombosis.

Being able to directly see the pathology at the post-mortem examination has been a brilliant opportunity to consolidate my anatomy and pathophysiology knowledge acquired at medical school, and I feel this will of benefit during my years of clinical practice to come.

**Objective 4: Consider histopathology and forensic pathology as possible careers and understand their role in medicine and society as a whole, including in criminal proceedings and how pathology research contributes to the development of the field and to that of clinical medicine.**

Being a discipline that aims to better understand the processes underlying disease, pathology is vitally important for development in the field of clinical medicine. It serves a crucial function of investigating the processes that caused death in a given individual. Supported by specimens taken for histology, toxicology and other specific tests, a cause of death, on the balance of probabilities, can be declared. By knowing a cause of death, it can be accurately recorded and contribute to the quality of epidemiological statistics and thence inform the focus of future research.

Through research, understanding of diseases and in turn their potential cures can be developed. Knowing the cause of death can also be beneficial for the family of the deceased offering peace of mind. In certain cases, genetic testing is advised by the pathologist to the family via the coroner's officers, which can confirm whether or not a familial disease is present and allows any appropriate treatment and follow-up to occur. Coroner's post-mortems also serve to screen for any potential foul play, and alongside the ensuing forensic post-mortem, ultimately serve to protect the public from danger.

During my six-week placement, I have attended or discussed over 12 forensic PMs along with their initial briefings and debriefings with the Police, including death by blast injuries, gunshot, stabbing, hanging, manual strangulation, positional asphyxia, neglect, bludgeoning and poisoning. I have attended over 20 coroner's PMs including severely decomposed bodies, and I can now appreciate the diagnostic difficulty such cases present. I have also discussed numerous other cases with the registrars and consultants. Having been given histology slides daily to examine I have gone from very rudimentary histology knowledge to having some faculty with the light microscope and a basic grounding in the normal appearance of most human tissues; I can now recognize and comment on some of the more common and important histological presentations including those of particular relevance to forensic pathology. I appreciate the importance of having a systematic thoroughness when performing post-mortem examinations and analyzing histology slides and other results such as toxicology.

I have greatly enjoyed my placement, both the forensic and non-forensic aspects. I am amazed how much information can be obtained through a post-mortem and histology slides, and appreciate how varied the day-to-day practice of a forensic pathologist can often be. I find the visual nature of pathology, with pattern recognition and the need to be immensely observant, very satisfying and the act of performing post-mortems is a very practical one which would contribute to a varied and fulfilling job. The depth and breadth of scientific knowledge required in pathology, which spans all areas of medicine, and being able to link this to a particular case where the disease process can be directly observed is another reason why I am seriously considering pathology as a career. The additional layer of legal considerations and ramifications inherent in forensic pathology greatly appeal to me and could allow for a further varied and rewarding career.

## References

- (1) The Index of Multiple Deprivation 2015, A Liverpool Analysis, Liverpool City Council. November 2015, accessed on 31st May 2017 at: <http://liverpool.gov.uk/media/10001/1-imd-2015-executive-summary.pdf>
- (2) Compendium of Health Statistics 2016, Liverpool City Council. Accessed 31st May 2017 at: <http://liverpool.gov.uk/media/9732/compendium-of-health-statistics-2016.pdf>
- (3) Deaths registered in England and Wales (Series DR): 2015. Office for National Statistics. November 2016. Accessed on 2nd June 2017 at: <https://www.ons.gov.uk>