

ELECTIVE (SSC5b) REPORT (1200 words)

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

RADIOLOGY ELECTIVE REPORT

BARTS AND THE ROYAL LONDON

Objectives:

1. What are the prevalent cardiothoracic diseases within London and how does this relate to challenges and changes seen in health in the UK and around the globe?

London has a large and diverse population with a range of ethnicities, social backgrounds ages and so shows a vast array of pathologies. Nevertheless, the most important causes of mortality in London still reflect the patterns seen in the rest of the country. In 2012, the leading causes of mortality in men in London were: 1. Ischaemic heart diseases; 2. Malignant neoplasm of trachea, bronchus and lung; 3. Chronic lower respiratory diseases; 4. Cerebrovascular diseases; and 5. Dementia and Alzheimer's disease and in women were: 1. Ischaemic heart diseases; 2. Dementia and Alzheimer's disease; 3. Cerebrovascular diseases; 4. Malignant neoplasm of trachea, bronchus and lung; and 5. Chronic lower respiratory diseases. [1] [2]

During my placement I found that the greatest exposure was around malignant disease in particular of the lung and nearby structures (as well as other malignancies). This is due to Barts being a cancer centre. Imaging these cancers is done routinely with a variety of methods (see objective 2). Despite recent developments lung cancer remains the leading cause of cancer death in the UK (22%, 6.2% of deaths overall) however new small molecule inhibitors have had a promising impact on this disease. [3] COPD and pneumonia are two non-malignant pulmonary pathologies which are responsible for 5.3% and 5.1% of all deaths in the UK [4] and coupled with decompensation of cardiovascular disease, were predominant pathological findings on chest radiographs during my elective.

An important disease to remember as well is TB. Newham has a very high incidence of TB with 118 new cases per 100,000 population compared to the city centre which has an incidence of 13.5 new cases per 100,000. Importantly, a migrant population is an important factor here both due to new immigrants and individuals visiting home frequently and bringing back the disease. [5]

Globally the high prevalence and disease burden of TB can be categorised to two large factors. Multi drug resistant form of the bacteria means treatment is ineffective (e.g. Bangladesh, Pakistan, Somalia and middle east) and co-infection with HIV results in reduced immune function (e.g. Swaziland, Ghana) again resulting in higher prevalence. [6] Both these patterns of disease are seen in the UK albeit less frequently.

2. How do the types of radiological investigation instigated in a tertiary centre differ to that of other centres in the areas in the UK and abroad?

A key factor here is the localisation of specialist services within certain centres. The most relevant example to my elective is St Bart's Hospital which is the trust's cancer specialist centre. As a result requests for specific radiological investigations that relate to malignancies are localised to the same centres. One such example is Positron Emission Tomography (PET) which highlights areas of the body with increased metabolic activity highlighting malignant metastatic lesions well.

This is in contrast to other investigations such as plain radiographs, ultrasound and fluoroscopy which due to their relative cheapness, availability and safety (less or no radiation exposure involved) are more common. These are requested by primary, secondary and tertiary care. The affordability of these imaging modalities is also an important reason for their use in less developed countries compared to CT and MRI. Additionally skilled operators and radiologists are required for these relatively more complex scans which may be a limiting factor in some areas.

3. To better understand the impact of ordering a radiological investigation for a patient and the associated costs and difficulties for the NHS and its staff.

From the point of view of the clinician, requesting scans and other radiological investigations is a useful tool. The ease of requesting and availability of imaging (especially CXR and US) means clinicians have come to rely on these modalities to help in the process of diagnosis. The development of accurate and quick imaging modalities has undoubtedly been beneficial for patient care. During my placement, I have been fortunate enough to experience this from both the radiologist and radiographers point of view. As a result I was exposed to certain cases where one could question the need for the investigation in the first place. It was not uncommon for requests to be sent lacking the adequate clinical details to help tailor the scan. This was especially common with ultrasound scans with referrals coming from more junior members of teams and from GPs in the community. Commonly, referrals for scans were made for vague abdominal symptoms with no abnormalities found on the subsequent scan or lower limb scans looking for DVT with oedema being the only symptom. Lists are very pressured with sonographers, radiologists and the imaging staff working hard to incorporate outpatient scans as well as inpatient procedures requiring ultrasound. This highlights the importance of vetting of CT scans to prevent inappropriate referrals preventing patient receiving high doses of radiation unnecessarily. This will shape my future practice as I shall ensure thorough clinical examinations are completed prior to imaging requests, as well as ensuring the request itself has all relevant clinical details as well as a clear clinical question to allow the radiologist to better tailor the scan for the patient's clinical need.

4. To improve my skills at interpreting imaging of a wide range of modalities, namely US, X-ray, CT and MRI.

Much of the radiology teaching I have received as a medical student has been ad hoc teaching on wards, highlighted usually when there was specific pathology of note relevant to the placement at the time. The process of formally interpreting plain radiographs of the chest and abdomen was addressed early in third year with the expectation of recognising basic pathology only. In my final year, where placements were tailored towards preparation for working as a junior doctor it became obvious that I would need to be able to interpret radiographs of greater complexity as well as being able to identify abnormalities on other commonly used imaging modalities namely CT, ultrasound as well as MRI. I was fortunate and grateful to receive formal teaching on these topics. I knew knowledge of anatomy and understanding of the underlying physics behind imaging would be important however I was surprised at the depth of knowledge with regards to pathophysiology needed to interpret images such that they are useful clinically. A key overriding theme has been the use of a systematic approach (which does vary depending on the individual) to ensure any and all (small and possibly significant abnormalities maybe be missed due to finding obvious problems) pathology is identified and highlighted to the appropriate clinical team.

Bibliography:

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