ELECTIVE (SSC5b) REPORT (1200 words)

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

Describe how ACS and MI are managed in comparison to the UK, and discuss in the context of global health

Spending two weeks in a country that juxtaposes the UK's public healthcare system was an eye-opening experience, especially in a technologically integrated field that cardiology boasts over here in the States. Common presentations such as acute coronary syndrome, in the UK are funnelled into the ACS algorithm, which delineates the treatment into thrombolysis and PCI depending on resources (more specifically being the case for NSTEMI). In the US, resource is not a limiting factor. Financial burdens aside, any and every case of ACS is either treated with percutaneous coronary intervention (PCI) or CABG in line with the American Heart Association (AHA) and American College of Cardiology (ACC) guidelines on coronary revascularisation (1). With Tampa being serviced by at least five hospitals, four of which encircle Tampa General located in Downtown Tampa, the adage of "time is heart" is followed with little difficulty and outcomes remain consistently excellent. My experience in shadowing cardiologists that work in Zephyrhills, Plant City and Wesley Chapel, which are neighbouring towns adjacent to Tampa only emphasised the success and competency found in interventional cardiology that has prospered across the Atlantic not least because it is viewed as an effective business model first and foremost.

While not a major focus of the placement, the repercussions of this capitalist framework on clinical medicine are inescapable in the very instruments used in the cath lab. Take the example of fractional flow reserve (FFR), which is a value that corresponds to the ratio of coronary pressure distal to the lesion over proximal to it. FFR less than 0.75 prompts immediate revascularisation of the lesion, whilst an FFR score above 0.8 suggests ischaemia-inducing stenosis that can be treated with medication. The UK adopts an advanced version called iFR, first introduced by the Imperial group of Gotberg et *al*. since the 2017 randomised control trial. While the UK calculates an equivalent cutoff without the need for a hyperaemic agent such as adenosine when compared to FFR, this apparent advantage is also evident in the AI-derived calculations of FFR using new technologies such as CathWorks FFRAngio. This system integrated into the Cath labs in Tampa's auxiliary hospitals is able to spit out the FFR value with only a few images of select views on angiography. With its 91% sensitivity versus invasive FFR and 93% diagnostic accuracy over 5 cohort studies, FFRAngio is exemplary of the US' duality of being both cutting-edge and commercialised. What pushes this even further is the idea of representatives from these companies such as from CathWorks or Inari for thrombectomy devices becoming crucial players in the MDT. These reps play an advisory role during the procedure, often giving suggestions and information on what the next step of the case should be.

Describe the pattern of health provision in the US compared with the UK

The trade-off of the US healthcare system is that management approaches are more proactive instead of a slow scaling-up of treatment seen in the UK, but at the patient's expense. Insurance and hospital bills aside, cardiac chest pain prompts rapid escalation to the Cath lab even if said pain might have subsided. In the UK, the level of care, while free, follows an incremental approach, beginning with blood tests and examinations and there is a higher threshold in ordering scans for patients. This threshold does not exist In the US, scans are authorised by the clinician liberally, as they may also be requirements for certain treatments and procedures under insurance policy. This is more so true in what are known as 'offices' in the US, which are clinics for the specialty. A significant proportion of appointments with physicians in offices revolve around clearance of patients for surgery through necessary scans such as echocardiography or a nuclear stress test. This is to both rule out inducible cardiac ischaemia and chronic heart conditions and also to give the green light to the HMO for a certain procedure. In the UK, cardiology clinics also involve some pre-op assessment, but it represents a smaller proportion of appointments where many involve a standard follow-ups with medication optimisation and symptom control.

Investigate the impact of socio-economic factors on patient outcomes compared with the UK

One pivotal question that drastically affects the level of care in the US that is not asked in the UK is the type of insurance a patient has. Whether it's HMO or Medicare, there exists regulations on what can and cannot be ordered in terms of imaging and intervention. For instance, those with the simple health maintenance organisation insurance cannot request varicose vein treatment purely on a cosmetic basis,

whereas for Medicare, the threshold for venous sclerotherapy is much lower as loss of collateral vessels can cause and exacerbate venous ulcers, venous stasis and venous thromboembolism.

In certain scenarios, the disparity in accessibility for care is apparent due to strict regulations on who can receive said care packages, specifically MedicAid, which exists for people who are financially disadvantaged. Prognostically improving treatment such as valve replacement surgery may not be offered in the case of drug-induced cardiomyopathy especially in the setting of illicit drug abuse such as cocaine or heroin. In the latter case, this was seen due to the complications of IVDU and recurrent endocarditis, which made it difficult to justify surgical replacement of her dysfunctional tricuspid valve. The underlying reasoning would be that any benefit and remission to a disease-free state would be reverted in the long-term. This category of patients is seen unfavourably by insurance companies. That being said, a capitalist system such as this still allows for altruism at the discretion of the senior physician who would treat a patient knowing he would be paid next to nothing for doing the ensuing procedure. On these occasions, I was pleasantly surprised when this happened in interventional cardiology as you could feel how appreciative the patient was. It also proved that doctors, at least the cardiologists I was working with, demonstrated the same level of empathy that is central to clinical practice in the UK.

Of course, the reverse is also true. Patients with higher levels of insurance including a preferred provider organisation (PPO), are in no shortage of health screens, even in the cardiology space where stress tests and nuclear imaging are liberally performed. The threshold to greenlight everything from a stress test to a coronary angiogram is much lower in the USA compared to the UK if all things equal, which brings both pros and cons. Pros include better patient outcomes as stenoses are identified earlier before irreversibility and can thus be preemptively stented. However, such overt treatment before definitive pathology can lend itself towards iatrogenic risk and unintended harm when considering the injection of nephrotoxic contrast and the list of complications associated with PCI. While the NHS balances cost with pragmatism, the cost of that approach is that stents are only given when the infarction has already set in. Whereas, prevention of ACS in the States is beyond purely medical therapy like the UK where the control of risk factors represents the limit of care.

Objective 4: discern the differences in the doctor-patient relationship and communication between them

Cardiologists in the US, during rounds, show a similar level of swiftness that UK consultants do, but in general spend much less time breaking down the cases and interacting with said patients. This is because, a lot of the clinical workload, at this stage of the career when they own private clinics, is offloaded to nurse practitioners who take over the notetaking and prescribing before and after rounds. Another interaction unique to the US is that the cardiologists would hand out their own business cards, but this itself is not common practice in the case of hospitalist doctors for example. Residency in the US is often more intense than the foundation programme, where it is common for residents to spend 80 hours a week on the job, in comparison to the UK's upper limit of 48 hours. While I thought that doctors over in the States were more paternalistic than that of the UK, the innate altruism of these physicians I shadowed came through when they decided to help treat people below the poverty line, ignoring any loss they would be incurring because of it. This happened in the case of cocaine-induced dilated cardiomyopathy, where the patient was pending for MedicAid but was not under it. The cardiologist made the decision to continue with the life-saving cardiac catheterization without a second thought.