Reflection # 2 – Lecture 7 Neurorehab Interventions

This lecture talked about recovery vs. compensation. Recovery means that you are able to execute behaviour just like you used to before you lost motor control. Compensation means you execute the same behaviour through other means. For example, if trunk movement occurs when someone who’s had a stroke tries to reach something that originally would have been at arm’s reach is compensation. Recovery is when the person can reach the object in the same way as they did before stroke. This can be related to transcanal endoscopic ear surgery (TEES) in the following way. Traditional microscopic surgery allows two hands to operate but TEES does not. Tasks that require two hands would have to be completed single-handedly, requiring a degree of compensation. For example, cutting bone within the middle ear. A drill is used to cut bone and it requires irrigation and suction simultaneously to suck up the bone pieces. The drill head provides irrigation, but no suction. Therefore, to compensate the loss of one hand to operate, the surgeon has to irrigate/drill a little bit, then take out the drill and insert suction. The surgeon keeps switching tools in such a way to ensure the task of drilling bone is done appropriately. Through repetition, the surgeon will be able to do this more easily which can be compared to the neurorehab intervention of repeated movements, helping patients learn how to regain motor control.

We also learned that sleep enhances motor control learning after stroke. It would be interesting to study whether regular sleeping patterns would help the surgeon learn how to perform single handed surgery with higher skill. Resident doctors are usually not on regular sleeping patterns due to the demanding hours of their job and so a research question could be: do residents’ abnormal sleeping patterns affect their motor learning for surgical techniques? It would be hard to find a control group of residents who would have regular sleep patterns due to their demanding job.

As well, to learn the motor movements required to perform TEES, instead of task-oriented training which would be learning how to perform tasks during surgery, performing movement-oriented training may be effective. This follows with the Kata project, a therapy for post stroke patients which includes a robotic dolphin game simulation. For TEES, the patients would simply move instruments to learn motor control instead of performing a task. Here, the trainee surgeon would feed the instrument inside the ear canal alongside the endoscope and explore around the anatomy to see where and how to reach and move effectively inside the surgical field.