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Independent Study & Mentorship

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Battle of the Scans

Assessment 9 - Research

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Subject: Computed Tomography Scans and Comparing it to MRI Scans

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McCollum, Daniel. "Head CT Interpretation Made Easy." *Youtube.com,* 28 September 2015, Accessed 21 Dec. 2018.

Odle, Teresa. "Computed tomography scans." *The Gale Encyclopedia of Medicine*, edited by Jacqueline L. Longe, 5th ed., Gale, 2015. *Science In Context*, http://link.galegroup.com/apps/doc/EDABJA733175019/SCIC?u=j043905010&sid=SCIC&xid=88dc63ac. Accessed 4 Dec. 2018.

Assessment:

In efforts to learn more about the different types of technology that are used to study the brain and diagnose neurological conditions, I decided to conduct research over CT scans and how to interpret its results. Previously, the science behind MRI scans and how to interpret such

scans was discussed, so the purpose of this assessment will be to explain how CT scans work and compare them with the functioning of an MRI scan.

To begin, CT scans, or Computed Tomography scans, employ the use of x-ray beams that create cross-sectional views of the body and its organs. A relatively new invention, CT scans have become the preferred method of scans due to their affordability and popularity with patients. Unlike MRI scans, CT scans are quick, and they dismiss the fears of claustrophobics due to its open internal structure. Although both MRI scans and CT scans are both relatively safe, they have their own set of risks. CT scans use radiation, so such a scan may not fare well with pregnant patients. On the other hand, MRI scans use strong magnets and this may pose grave consequences if proper precautions are not followed prior to using this technology. Although CT scans can be used to read the the brain, MRI scans are preferred because they are more detailed.

At first glance, both MRI and CT scan results look quite similar; they both provide a grayscale image of brain. However, in CT scans, there is a completely different method for reading the results. First off, different substances found in the brain such as air, fat, and water have unique windows which are measured in Hounsfield units (Hu). Using the Hounsfield units, neurologists can then create a more accurate diagnosis. Secondly, there is a distinct order that is followed when determining which structures to first look at in the scan. The order goes as follows: blood, cisterns, brain structure, ventricles, and bone. Learning about this order was interesting because it brought to light how much more methodical reading a CT scan is than reading an MRI scan. Thus, in the future, I hope to conduct more research on MRI scans and see

if there is a more structured way to interpret the scans rather than looking at all the parts as a whole.

While learning about how to read CT scans, I found the topic of interpreting blood accumulations to be quite interesting. In the past, I have done research on strokes, and hemorrhagic strokes, or strokes that lead to the bursting of a blood vessel, must be diagnosed quickly because they can do a lot of damage in a short amount of time. Thus, since CT scans take significantly less time than MRI scans, it is important to learn about the distinctions in brain blood accumulations using this specific types of technology. In the scan itself, blood appears as bright white and there are five different types of shapes that can be seen, each of which correspond to a specific type of injury.

Overall, I feel more confident in my ability to read and interpret MRI scans and CT scans. During Health Science Clinical Rotations, I often heard doctors discussing the results of such scans and now using my newfound knowledge, I can understand them better. Ultimately, this knowledge will be in useful for my original work when I start to diagnose patients using the case study model.