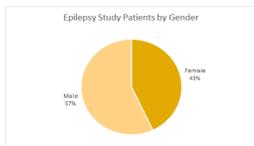
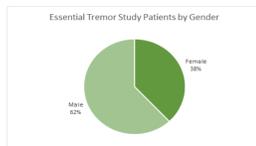
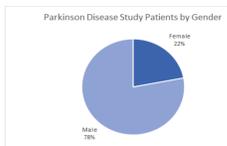


Introduction

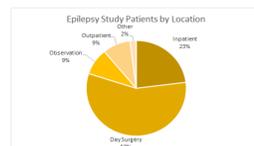
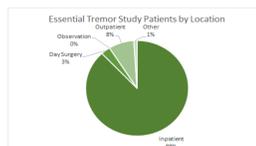
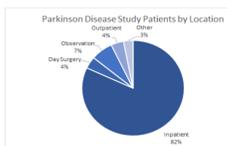
- ❖ Stereotactic implantation is a minimally invasive procedure that uses three-dimensional analysis to place devices such as deep brain stimulators to prevent tremors and responsive neurostimulators to prevent seizures throughout the nervous system, most prominently in the brain.^{1,2}
- ❖ This procedure has become an increasingly common treatment for conditions like Parkinson disease (PD), essential tremor (ET), and epilepsy. The procedure is also frequently used in cases of urge incontinence and musculoskeletal pain.^{1,2}
- ❖ When considering the risks and benefits of stereotactic implantation, one aspect to consider is postoperative length of stay (LOS). Longer LOS has been associated with increased risk for adverse drug reactions and hospital-acquired infections.³
- ❖ Although LOS has been analyzed for stereotactic procedures to treat multiple sclerosis, cancer, etc., LOS has not been thoroughly investigated for implantation of neurostimulators to treat PD, ET, and epilepsy.⁴⁻⁶
- ❖ The relationship between age versus LOS was analyzed in 219 patients who underwent stereotactic surgery for diagnoses of PD, ET, or epilepsy. Results of this research could add another variable when considering the safety of stereotactic implantation for potential candidates with PD, ET, or epilepsy. This study investigated whether a patient's age could be predictive of their LOS following stereotactic surgery.

Methodology

- ❖ Patient data was taken from Cerner Corporation's Health Facts database. The CPT codes used to identify patients who underwent stereotactic implantation were 61862, 61863, 61864, 61867, 61868, and C1778.
- ❖ All patients without the diagnosis of PD, ET, or epilepsy were removed from the study. In patients with more than one encounter listed, only the most recent encounter was studied. Patients without admit or discharge dates were excluded. Those with multiple relevant diagnoses were only listed by their primary diagnosis.
- ❖ This resulted in 101 diagnoses of PD, 65 patients with ET, and 53 patients with epilepsy. We studied 219 unique patients and encounters in total. The LOS was grouped into three categories: 0, 1, and 2 or more days. The data was analyzed using box and whisker plots and ANOVA.



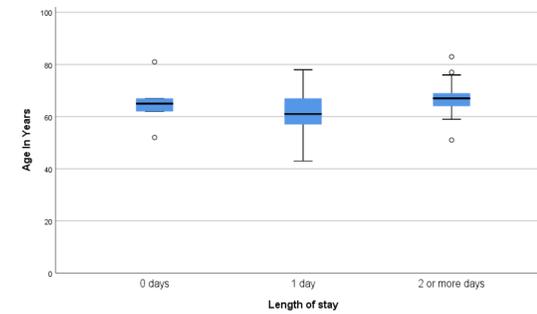
- ❖ The demographics of our data set shows that stereotactic implantation was of higher prevalence in males compared to females with PD, ET, and epilepsy. The data had a higher sample size for PD and a smaller sample size for ET and epilepsy.



- ❖ The data also shows that location type depends on diagnosis. In PD, 83 out of 101 patients had been treated inpatient. In ET, 57 out of 65 patients had been treated inpatient. In PD and ET, the patients were mainly treated inpatient with a few cases treated in other locations. In epilepsy, 30 out of 53 patients were treated in day surgery, with inpatient being the second most common location.

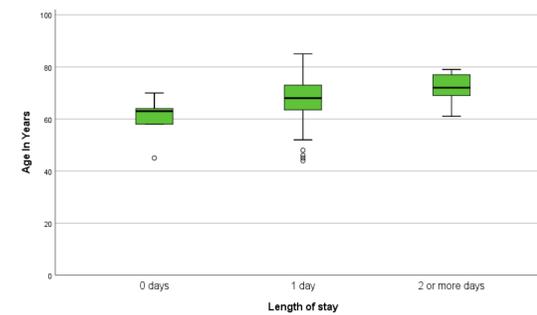
Results

Age vs Length of Stay in Parkinson Disease



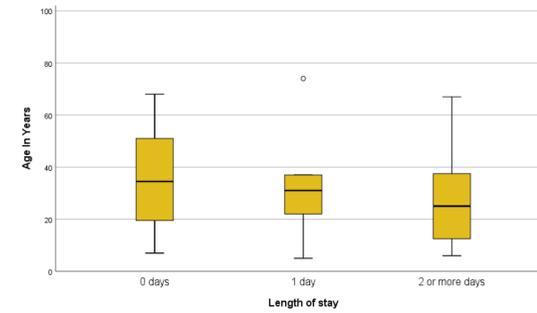
Parkinson Disease (n = 101)	
Length of stay	Mean age
0 days	65
1 day	62
2 or more days	67
p = 0.007	

Age vs Length of Stay in Essential Tremor

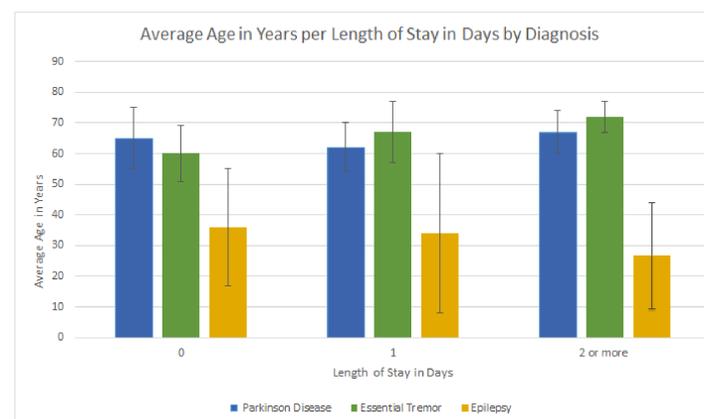


Essential Tremor (n = 65)	
Length of stay	Mean age
0 days	60
1 day	67
2 or more days	72
p = 0.027	

Age vs Length of Stay in Epilepsy



Epilepsy (n = 53)	
Length of stay	Mean age
0 days	36
1 day	34
2 or more days	27
p = 0.27	



Discussion

- ❖ PD patients showed less variability in age at the time of the procedure, with the average being 65 years old. Only 35 patients were under the age of 59 at the time of their stereotactic procedure, while 66 patients were aged 60 or above. This lack of age range in the most extensive diagnosis revealed that in the current standard of care for PD, stereotactic implantation is more heavily considered around age 65. The results revealed that the LOS did not share a dose-dependent relationship with the age of the patient, even though the mean ages between LOS categories within PD patients were significantly different (p=0.007).
- ❖ In ET, there was a greater range in ages since patients tend to choose this treatment when their quality of life is affected, which can vary. A dose-dependent relationship was observed. As the average age of the patient increases, the length of stay is also seen to increase. The average age with a stay of 0 days was 60. This increased to 67 in patients that stayed for 1 day. The patients who had stays of 2 days or longer had the highest average age of 72. Mean ages between LOS categories within ET patients were significantly different (p=0.027).
- ❖ Although the mean ages between LOS categories within epilepsy was not statistically significant (p=0.27), an inverse dose-dependent trend can be appreciated within epilepsy patients. The group of patients with a stay of 0 days was the oldest with an average age of 36. The average of patients staying for one day following the procedure decreased to 34. Patients who stayed the longest, 2 or more days, had the youngest average age of 27. This could point to the standard of care in epilepsy. Patients who receive the procedure much younger than others tend to be more severely affected by their disease and have other illnesses that would require longer periods of monitoring before discharge.

Conclusion

- ❖ Older age can predict longer LOS in patients undergoing stereotactic implantation for ET. The average age for ET patients with a LOS of 2+ days was 72.
- ❖ Older age does not predict longer LOS in patients undergoing stereotactic implantation for PD or epilepsy.
- ❖ Sources of error could include limited variability in the data set, patients being from a similar region of the country, analyzing a data set without enough data points and patients, methods of exclusion, and possibly coding a patient into an incorrect category.
- ❖ Future directions for research could include analyzing patients with more variable age presentations for PD, including more patients with early-onset PD. There could also be a study to look at the standard of care in these diagnoses and whether age affects when stereotactic implantation is chosen for treatment over other methods like medication. A larger data set focusing specifically on the three diagnoses mentioned before could give more definitive results.

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- *All students contributed equally to the research and analysis in this project.