



2022 LEAD Capstone Poster Session

A Cognition Mapping Program for Awake Brain Surgery (COMPAS)

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Abstract

- Brain surgery is often associated with cognitive changes as side-effects, and while most will resolve quickly, some may be permanent
- UTSW, unlike other top medical centers, does not have an advanced cognition mapping program to preserve cognition during brain surgery
- A cognition mapping program would provide new opportunities for precision medicine, research into plasticity of brain functions, and comprehensive training for neurosurgery & neuropsychology residents
- Building a program would enhance collaborations across Departments, help shorten surgery times, improve long-term cognitive outcomes, & potentially contribute to improved US News and World Report rankings



Objectives

- Create a sophisticated, standardized Cognition Mapping Program for Awake Brain Surgery (COMPAS) at UTSW
- Establish a training curriculum for neuropsychology and neurosurgery residents to understand how to assess in real-time the links between brain tissue and cognition and be prepared for carrying out a COMPAS program when becoming faculty at UTSW or other institutions
- Compare patient outcomes from the current standard of care to those after implementation of COMPAS to determine success in shortening surgery times & improving cognitive outcomes



Background Information

- Cognitive deficits are common in patients undergoing brain surgery for epilepsy & tumors, often involving language and memory problems
- With surgery aiming to maximize resection to reduce seizures or improve life expectancy, healthy tissue can become damaged
- Decrements in cognitive functioning have been documented in up to 60% of patients after receiving brain surgery to treat epilepsy/tumors
- Cognitive decline can lead to poor patient outcomes (inability to work)
- Mapping cognition during an “awake” (not sedated) brain surgery is an approach to identify the importance of healthy tissue to guide surgery to preserve functioning and lower risk of declines



Project Plan

Prepare Benchmarks

- Identify the ratio of patients that would be considered for COMPAS by UTSW neurosurgeons
- Record data from the current standard of care to evaluate effectiveness on patient outcomes pertaining to cognitive functioning (e.g., timing in return to work, life satisfaction)

Create COMPAS

- Gain rights to freely use an iPad-based testing platform designed to assess brain functions
- Design & complete training simulations to build effective collaborations with surgical teams
- Patients get tested before & during surgery to have a baseline to identify changes

Education & Patient Care

- Develop training activities on COMPAS for neuropsychology & neurosurgery residency programs
- Patients will be scheduled a 2-month neuropsychology post-op visit to help promote emotional adjustment & manage readiness for return to work or school



Innovation and Significance

- COMPAS provides a method to simulate cognitive deficits in real time in the OR before brain tissue is resected, lowering risk for cognitive decline
- Involving a neuropsychologist before/after surgery could improve adjustment and time to return to activities by teaching coping strategies
- COMPAS would further UTSW's mission to provide state-of-the-art, precision medicine to promote favorable patient outcomes
- Improving patient outcomes, a critical component in US News and World Report rankings, could contribute to improved rankings for the institution
- The program would provide unique training to residents about brain plasticity & circuitry involved in cognitive functions to make the residency programs for neuropsych/neurosurgery more marketable



Application of What You Learned at LEAD

Leadership

- I learned ways to adapt & personalize my style of leadership to each team member and their stage of development to cultivate a shared vision & goals
- I began & feel comfortable delegating tasks to team members and saying "no" to tasks that were not necessary to my role or career development

Conflict Resolution

- I learned to assess the values of others in situations with conflicting viewpoints
- I have been able to negotiate to accomplish desired goals that are mutually beneficial

Hiring New Personnel

- I was able to more effectively outline expectations and evaluate the skillset and needs when hiring my own research coordinators for the first time