Deep Brain Stimulation Technology

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Introduction

- What is DBS Technology?
- Why is it important?
A Brief History

- **Scribonius Largus, 50AD**
  - Electrical torpedo fish to treat headaches/gout

- **Luigi Galvani, 1786**
  - Conducted electricity through frogs leg nerves

- **Alessandro Volta**
  - Current through wire—built a basic but working battery

Surgery

- Pre-operative target planning to determine electrode placement
- Hole drilled in skull
- Electrode placement

- 4.5 hours for unilateral implant, 6 hours bilateral implant

### Risks

#### Surgery
- Brain Bleed
- Stroke
- Infection
- Breathing Problems
- Nausea
- Heart Problems
- Incision scarring

#### Post Surgery
- Seizure
- Infection
- Headache
- Insomnia
- Memory problems
- Temporary pain/swelling

#### Side effects of Stimulations
- Numbness/tingling sensations
- Muscle tightness in face/arms
- Speech and balance problems
- Lightheadedness
- Mood Swings

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Programming DBS

- Programming done post-op
- Various variables to consider
  - Electrode polarity
  - Amplitude
  - Pulse width
  - Frequency
- Increase until finding desired effect
- Process is about 20 hours


Conclusion

- Very helpful for people with Parkinson's, OCD, and other related diseases
- Looking into using this for depression, anxiety, and other related diseases
- Still needs a lot of work, but future looks bright


