

Deep Brain Stimulation (DBS) for Parkinson's Disease



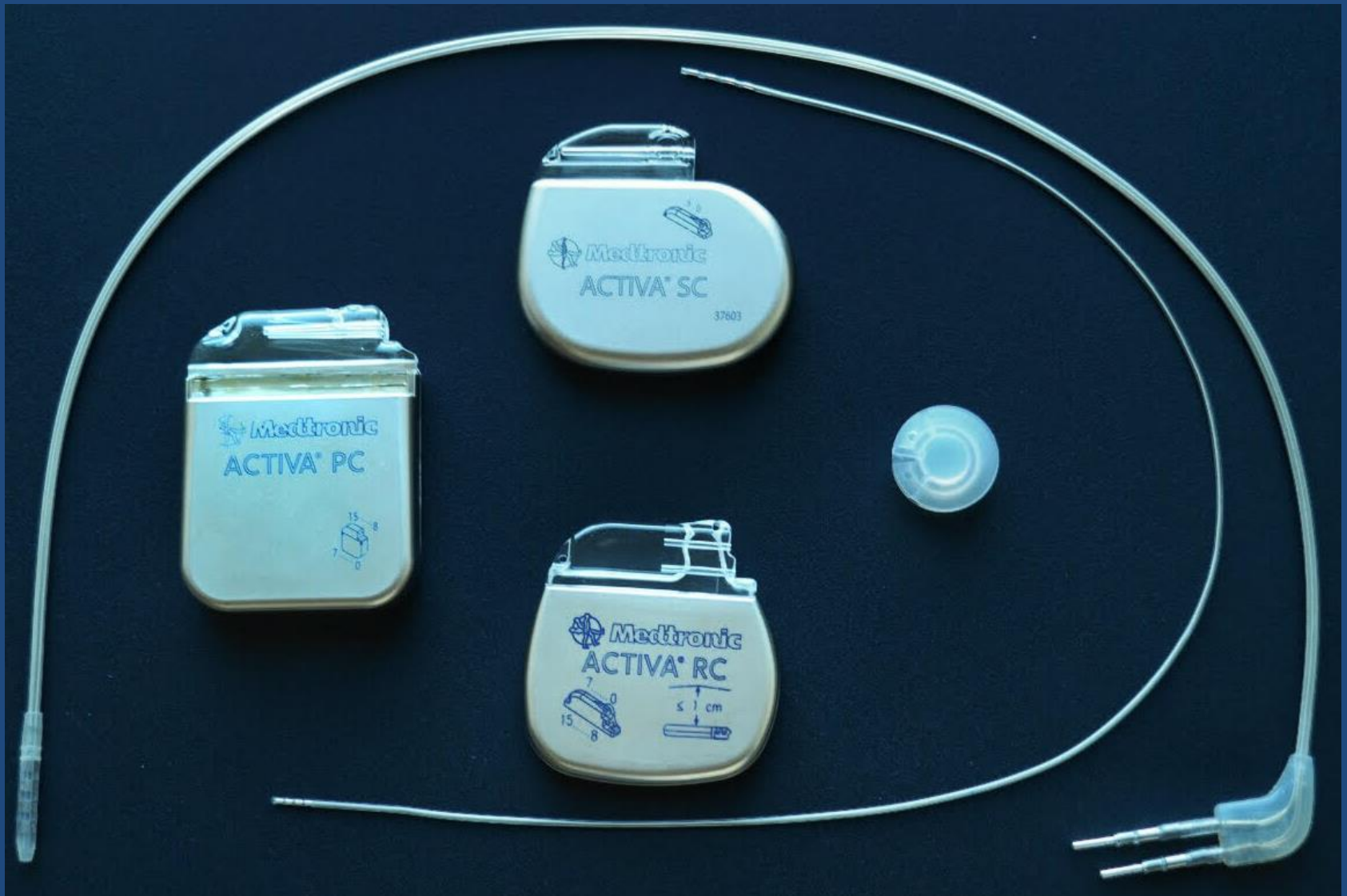
Objectives

1. What is DBS?
2. How does DBS work?
3. Benefits of DBS.
4. Who is a good candidate for DBS.
5. How do you get DBS?
6. What is involved?
7. Outcomes of DBS surgery.

What is Deep Brain Stimulation?



Components of DBS



Components of DBS





What does DBS help with?

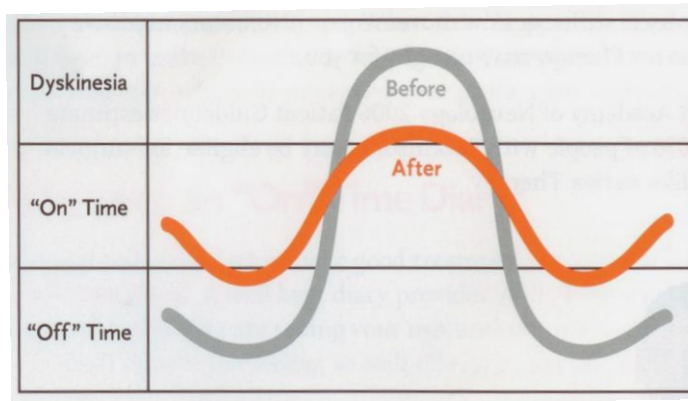


What symptoms does DBS Help?

- Motor Fluctuations that do not respond to optimal medication

DBS in PD

- Even up movement pattern over day



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Motor fluctuations

Dyskinesias

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Motor fluctuations

Dyskinesias

Tremor

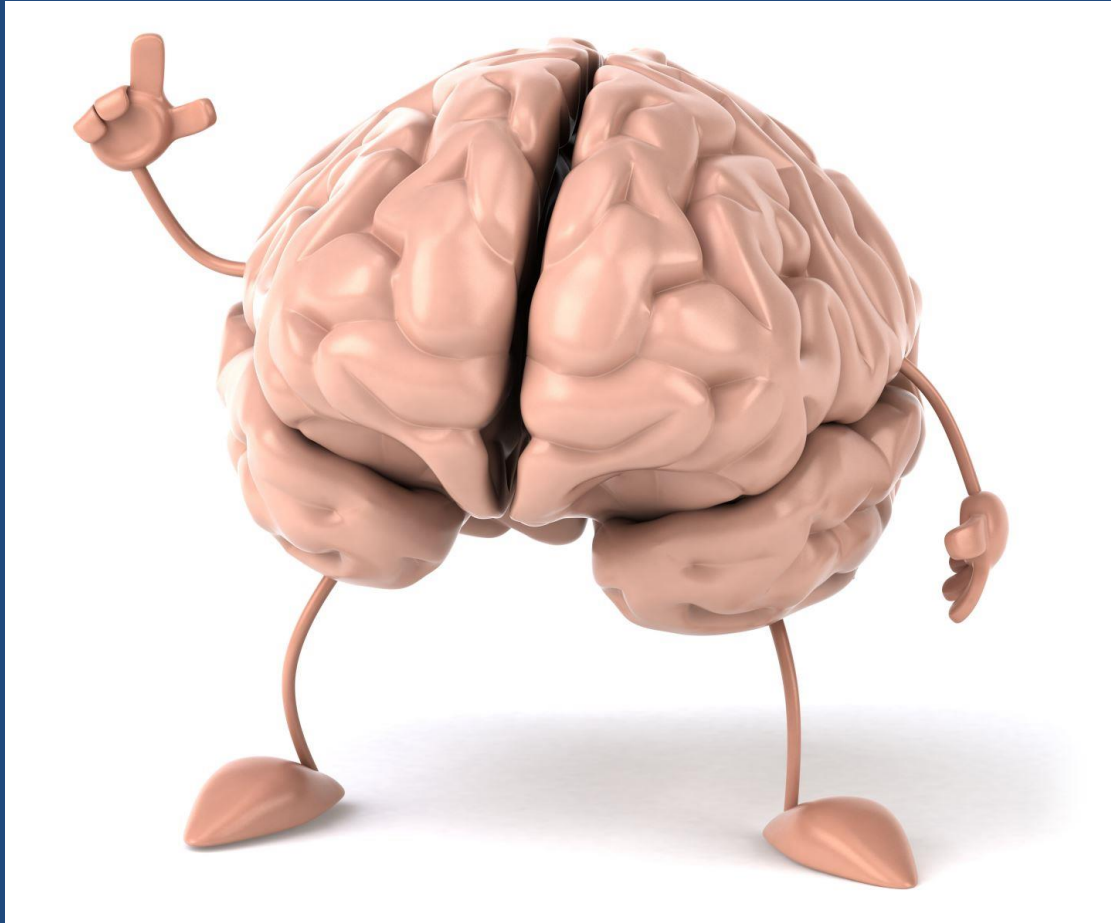
What DBS wont help with

- Balance
- Swallowing
- Speech
- Memory and Thinking
- Depression
- Anxiety
- Constipation
- Progression of PD

Treatment Options for PD

- Preventative
 - Not available
- Symptomatic
 - Pharmacological
 - Non motor symptom management
 - Allied Health-PT/OT/Speech
- Focused Ultrasound
- Surgical
 - Lesioning
 - Deep brain Stimulation
- Experimental
 - Stem cells/ Gene Therapy

Benefits of DBS



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 - No destruction of brain tissue
 - Reversible
 - Can be performed on both sides of the brain

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- Disabling tremor
- Unable to tolerate or increase PD medication due to side effects.

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- PD for at least 5 years
- “ON/OFF” fluctuations, with or without dyskinesias
- Disabling tremor
- Unable to tolerate medication due to side effects
- PD symptoms that interfere with daily activities

Contraindications to DBS

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Contraindications to DBS

- Parkinson's Plus symptoms
- Dementia or poor cognition
- Poor functional state while "ON" (PD patients)
- Other health concerns

What about age?



Am I a Good Candidate for DBS?



Pre Operative Assessment



Brain Targets

MOVEMENT DISORDERS

TARGETED STIMULATION

Deep-brain stimulation (DBS) is under study for the treatment of numerous brain diseases. From psychiatric disorders, such as depression and obsessive-compulsive disorder, to neurodegenerative ailments, such as Parkinson's and Alzheimer's, the insertion of electrical probes into the brain to either stimulate or inhibit neuronal activity is proving effective in reducing symptoms. The trick is finding the right target.

THALAMUS

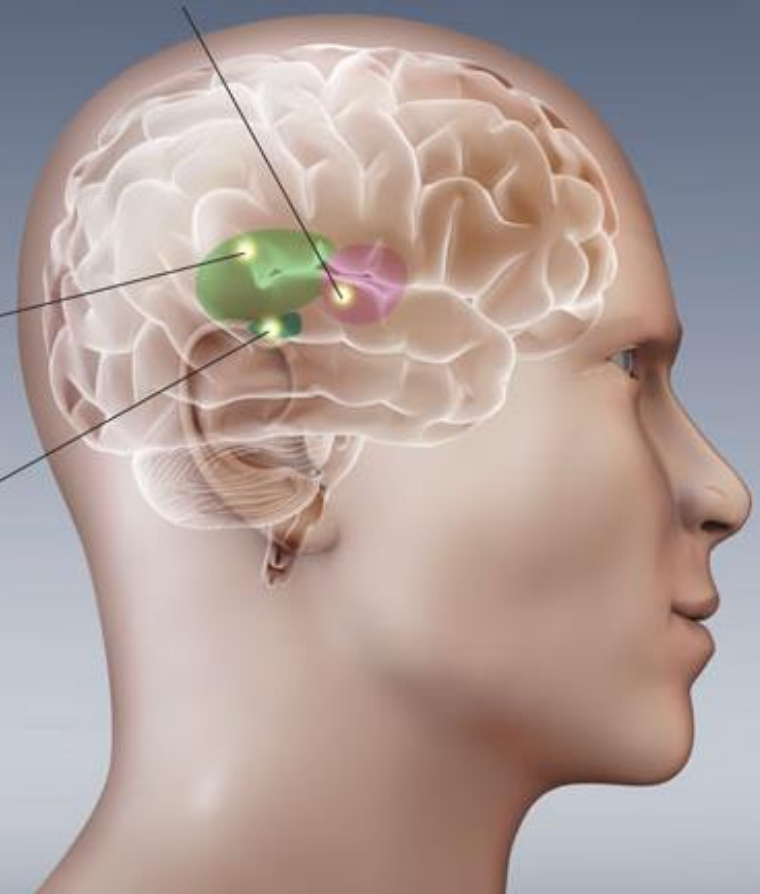
A region critical for relaying motor commands and feedback to and from the cerebral cortex, the thalamus has been targeted by DBS in the treatment of both Parkinson's and Tourette's.

SUBTHALAMIC NUCLEUS

Electrical stimulation in this region involved in voluntary movement helps relieve some symptoms of Parkinson's disease.

GLOBUS PALLIDUS

Helping to regulate voluntary movements, the globus pallidus is a target of DBS for Parkinson's, dystonia, and Tourette's patients.



Surgery



Attaching the head frame and MRI

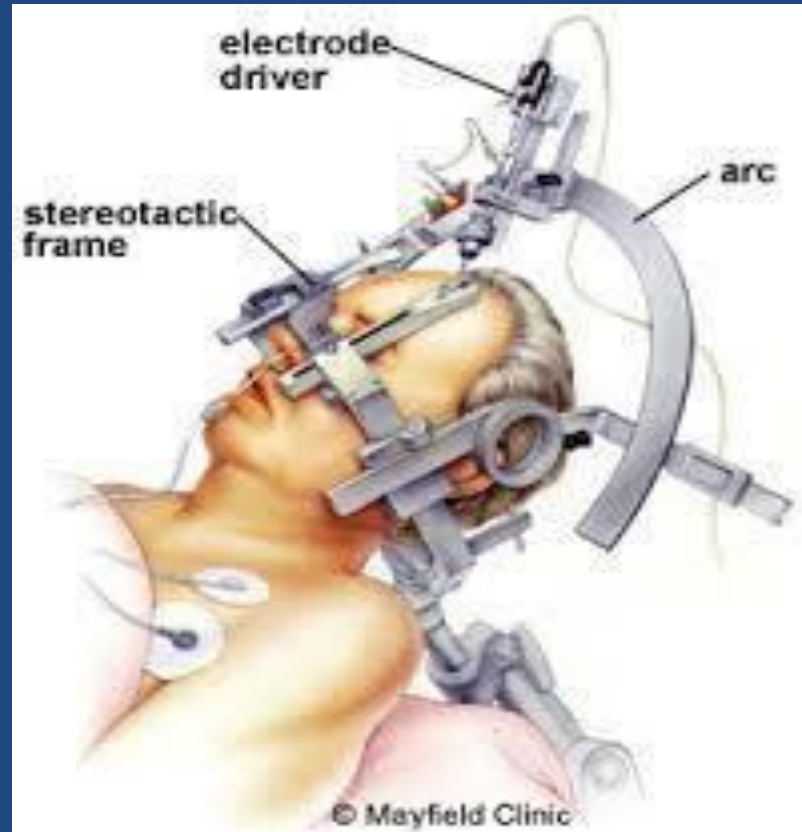




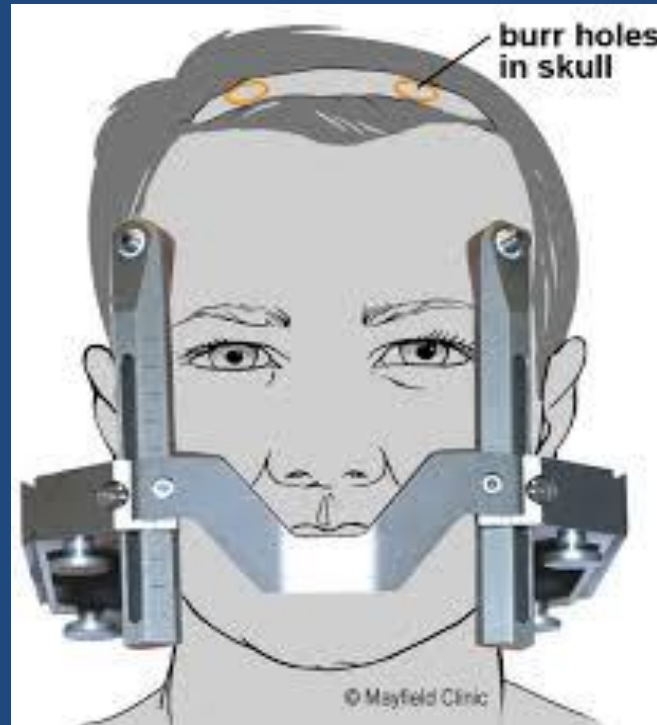
Planning the Trajectory



Placing the Electrode



Skin and skull incision



Stimulate the brain cells

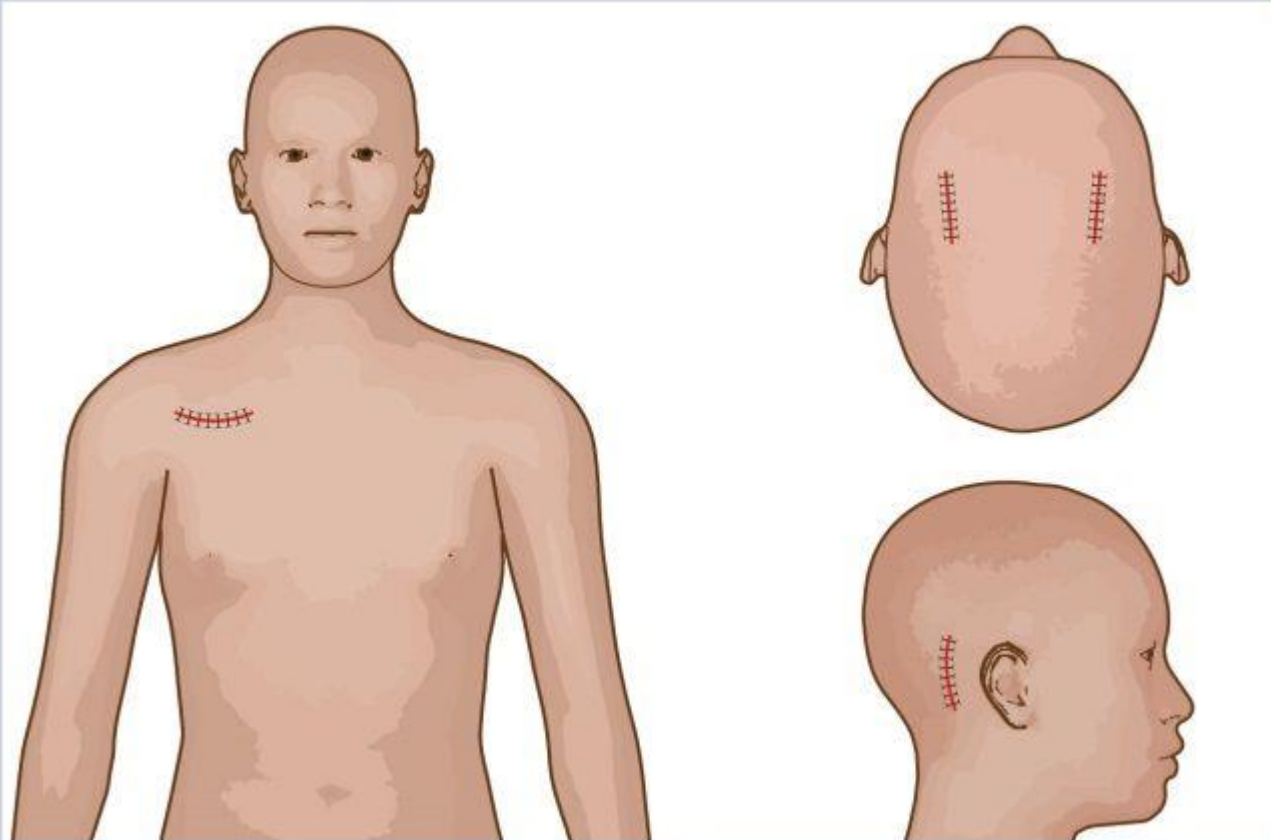


Placing the extension wires and neurostimulator



Incisions

Fig 1. **Deep brain stimulation surgical incision sites**



video

What happens after surgery



DBS Clinic

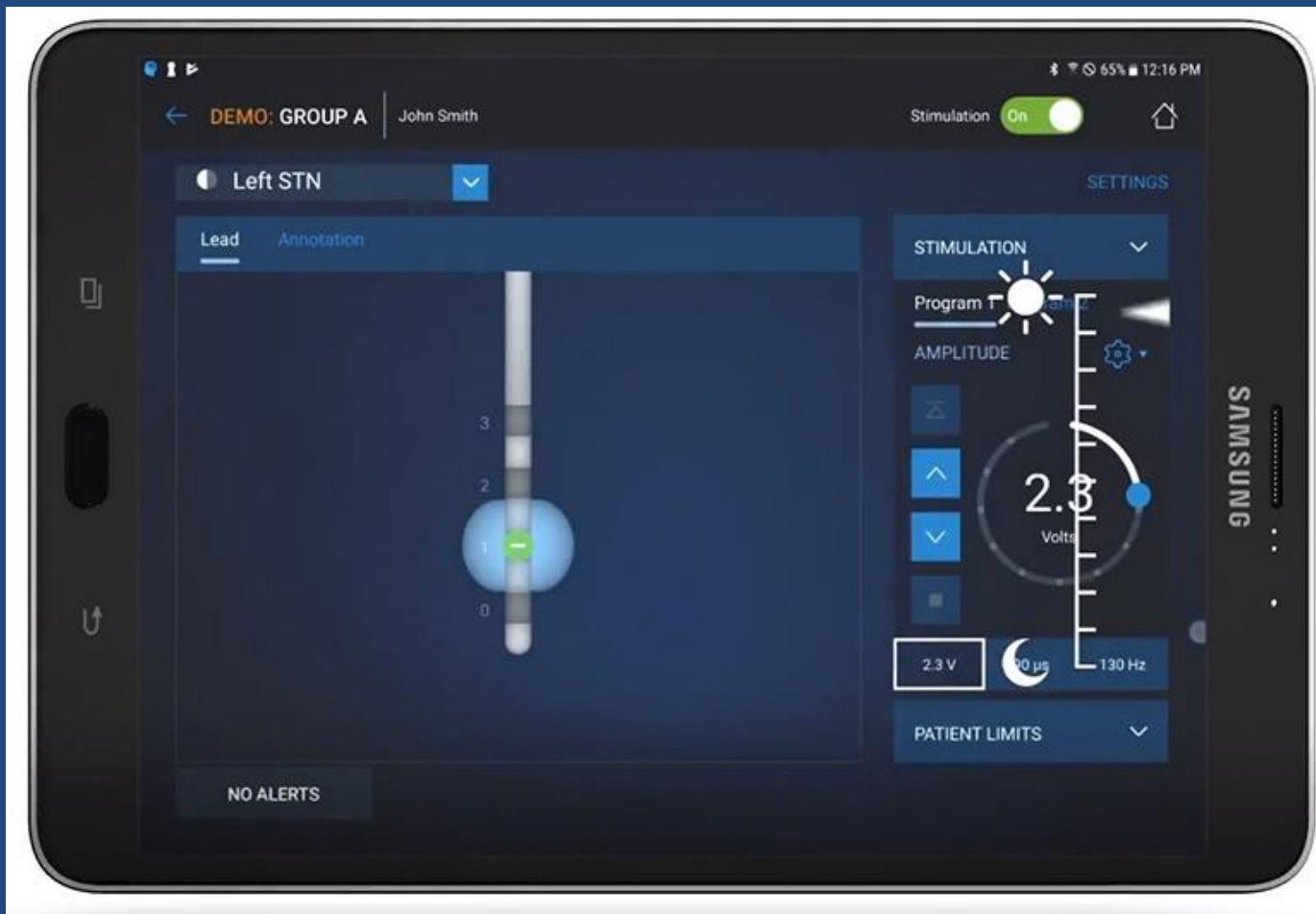


Programming the stimulator





Pic of programmer





Will my medications change afterwards?



Medication

STN

- Decrease in medications up to 40% possible.

GPI

- No reduction, may be able to increase medication to manage PD symptoms.

VIM

- Possible reduction in medication if other PD symptoms are controlled on lower doses.

Meds do more than help movement



Realistic Expectations after DBS?



Restrictions after DBS Surgery



What are the risks of DBS?

- Intracranial hemorrhage/CVA (<3%)
- Paralysis, coma, death (< 1%)
- Infection (5%)
- Allergic response to implants (<1%)

Advances in DBS

- Directional Leads
- 8 contact leads
- Blue Tooth connectivity
- Adaptive DBS



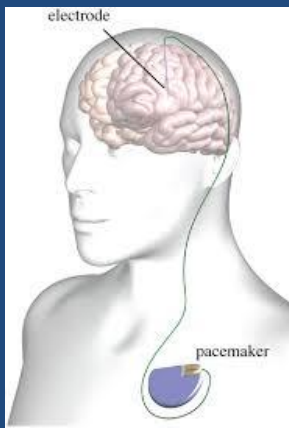


Questions?



How does DBS Work?





Implant
system

Frame

Listen to
the
Neurons

PROCEDURE

MRI Scan

Insert
Electrode

Pre Op
Target

