

# INITIAL EVALUATION (60-90 MINUTES)



- Discussion of your symptoms and how they have progressed
- Current medical management
- Goals from potential surgery
- Other medical problems
- Cognitive and psychiatric symptoms



# PRE-OPERATIVE EVALUATION



- On-Off testing
  - Performed by movement disorders neurologist
  - Arrive OFF scheduled Carbidopa-Levodopa
    - undergo motor function evaluation
  - Take Carbidopa-Levodopa
    - repeat evaluation
  - Evaluate degree of improvement (responsiveness) to dopamine replacement



# PRE-OPERATIVE EVALUATION



- Neuropsychological testing
  - Performed by neuropsychologists
  - Series of cognitive and psychiatric tests
  - Goal is to identify factors that may make limit response to DBS

# DBS CANDIDATE

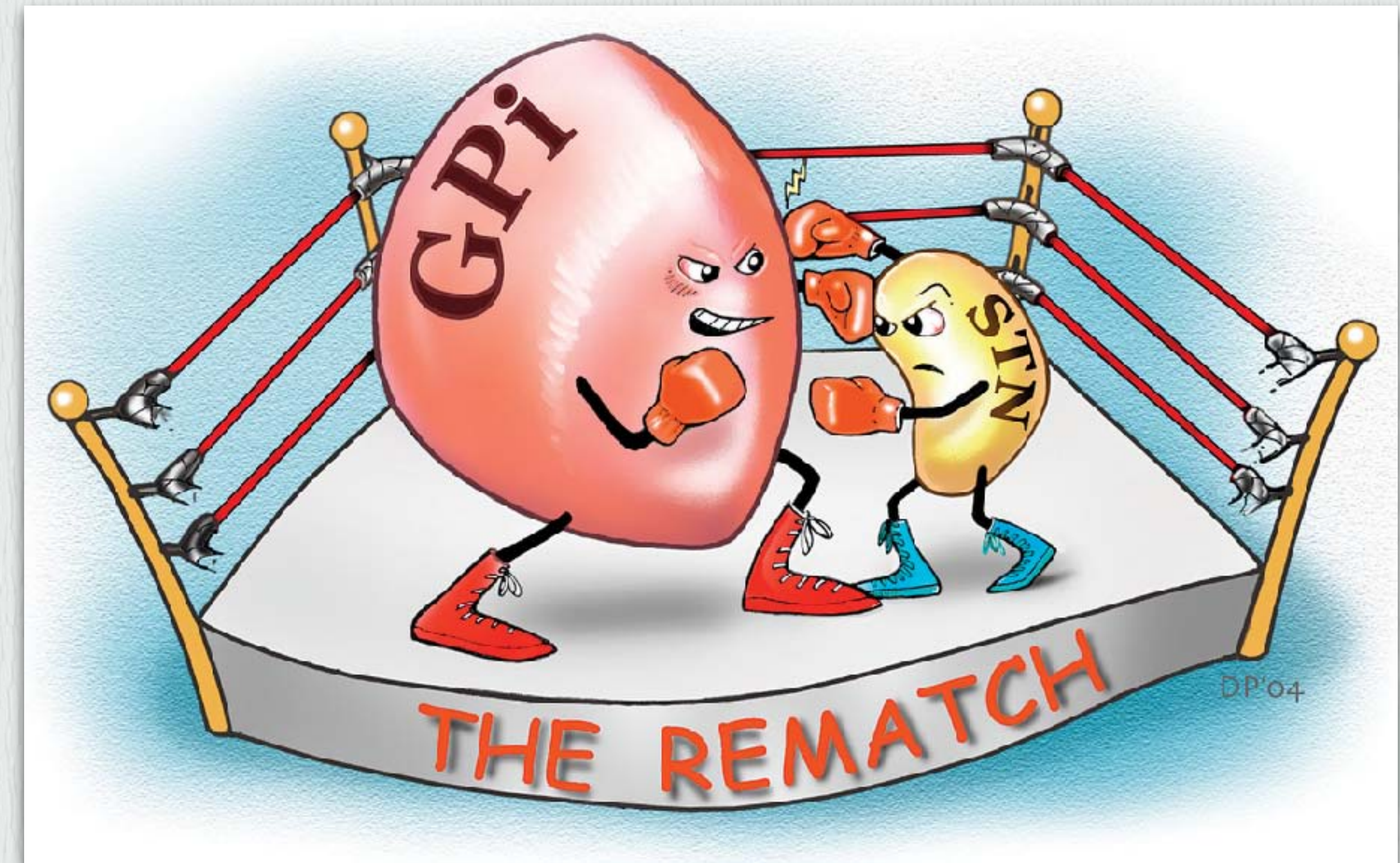


- Clear PD diagnosis (not atypical PD - multiple system atrophy)
- Good response to carbidopa-levodopa
- Best response to carbidopa-levodopa is best response to DBS (tremor may improve to greater extent with DBS)
- Good cognitive function

# DBS TARGETS



- Subthalamic Nucleus (STN)
- Globus pallidus internus (GPI)



# SYMPTOMS INDICATE TARGET

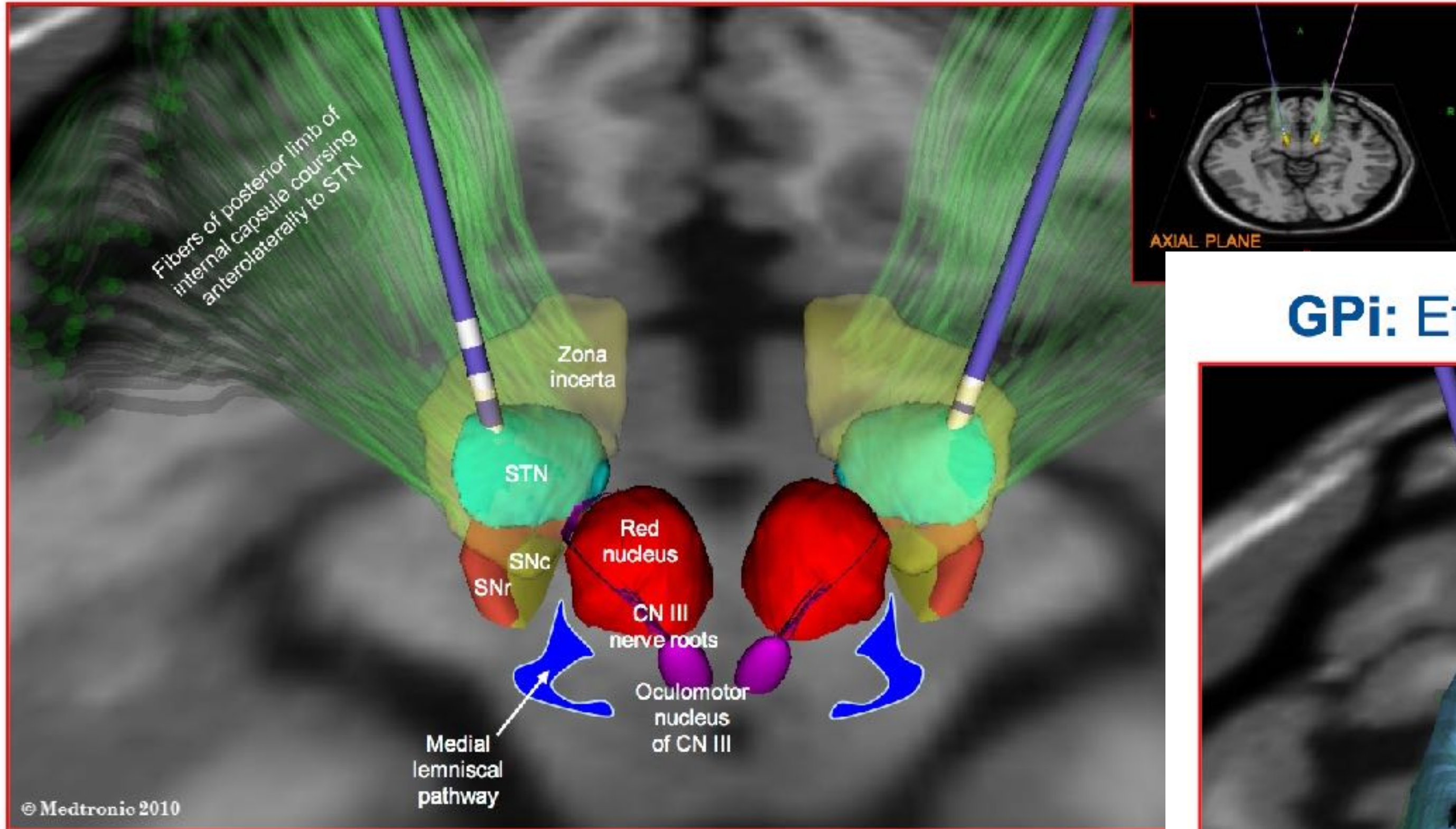


Favors STN	Favors GPi
<p data-bbox="916 1078 1349 1144">Severe tremor</p> <p data-bbox="849 1210 1416 1275">Severe fluctuations</p> <p data-bbox="749 1341 1516 1407">Medication reduction goal</p>	<p data-bbox="1849 947 2349 1013">Dystonic features</p> <p data-bbox="1832 1078 2365 1144">Severe dyskinesias</p> <p data-bbox="1899 1210 2299 1275">Gait instability</p> <p data-bbox="1649 1341 2548 1407">Cognitive/psychiatric symptoms</p> <p data-bbox="1965 1472 2232 1538">Age &gt;70</p>

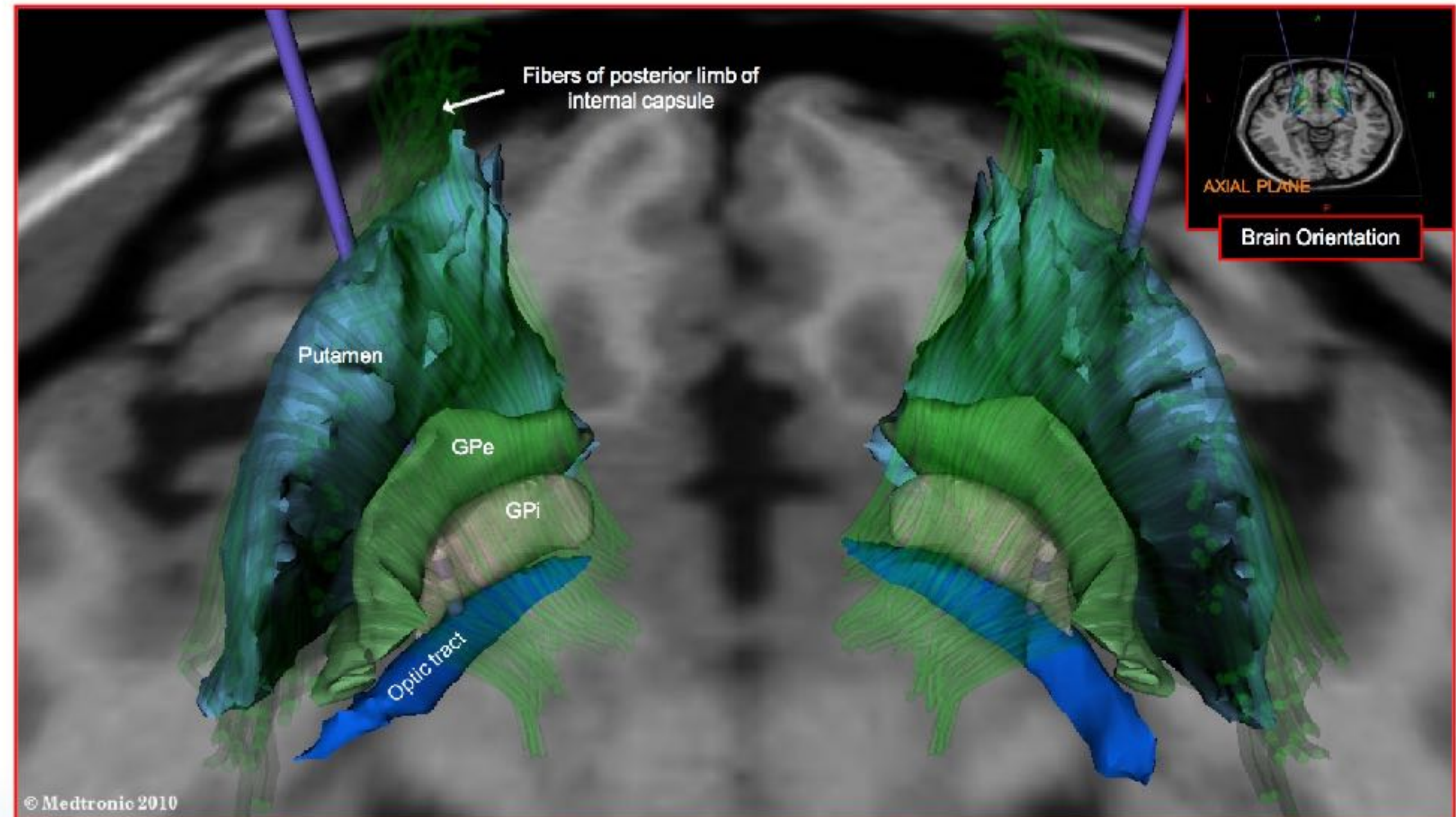
# ULTRA-PRECISE TARGETING



## STN: Effectively-Placed Bilateral Leads



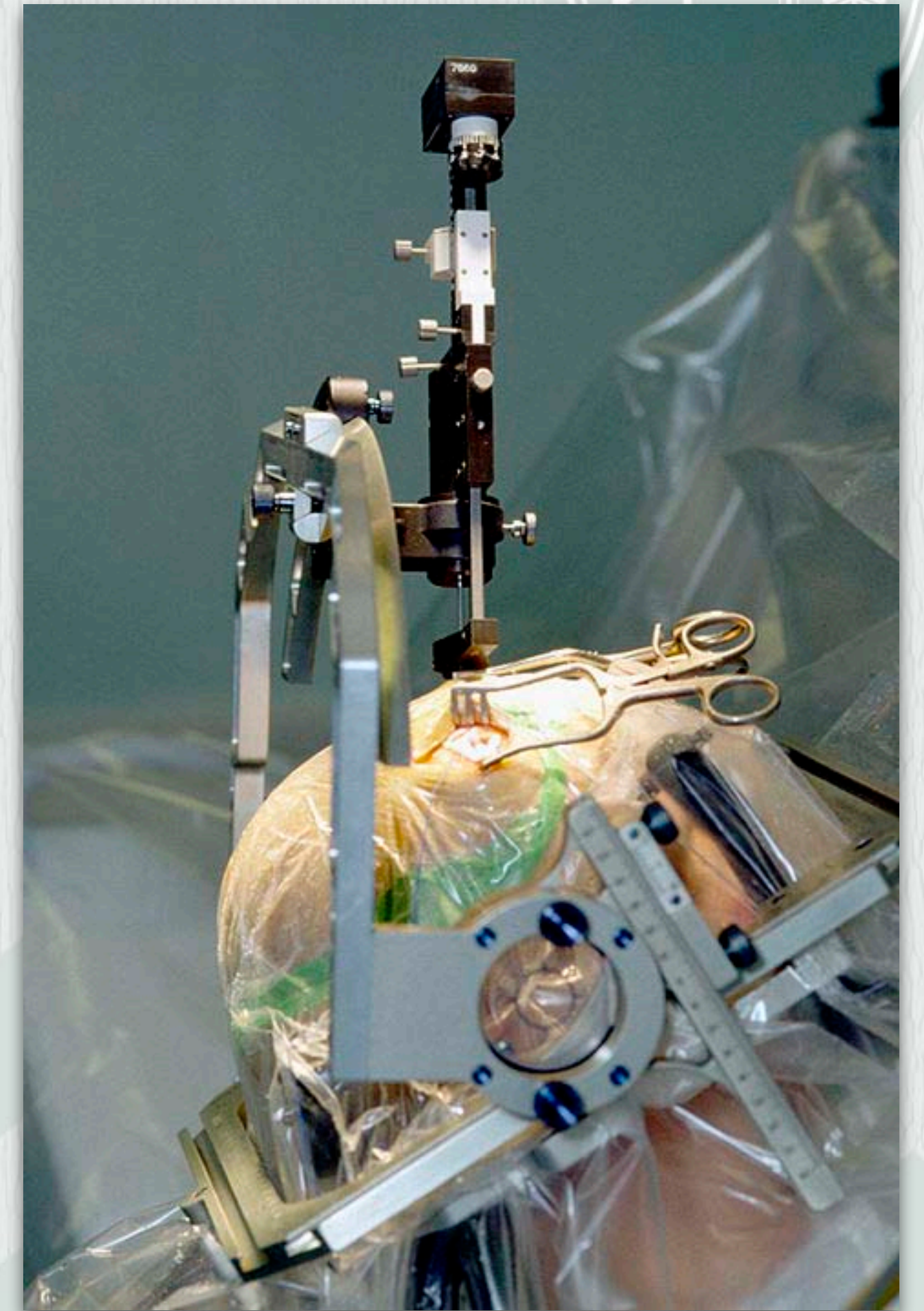
## GPI: Effectively-Placed Bilateral Leads



# TRADITIONAL STEREOTACTIC FRAME



- Accurate
- Frame bolted to OR table
- Blocks peripheral vision





# “FRAMELESS” STEREOTAXY



- StarFIX system - No longer fixed to the OR table
- Custom 3D printed frame made for each patient
- Improved comfort
- Excellent accuracy



# THREE PART SURGERY



## **Part 0:** Bone Anchor Placement (outpatient)

- MRI (45 minutes)
- Fiducial placement (two frontal, two posterior parietal), under local anesthetic (20 minutes)
- Thin-cut stereotactic CT (5 minutes)

## **Part 1:** DBS Electrode Placement (inpatient)

- Sedated but not asleep
- Intra-op brain recording and physiologic testing
- Immediate post-op CT
- Admitted to ICU for 24 hours, followed by discharge home next day

## **Part 2:** DBS Extension Lead Tunneling and IPG Placement (outpatient)

- General anesthesia
- Tunneling from cranial to chest incision subcutaneously
- DBS battery is OFF when first implanted
- Usually go home, but if in discomfort, can stay in observation status overnight

# ADVANCED SURGICAL FACILITY



- Surgeries all done at DHMC Lebanon in Center for Surgical Innovation
- Advanced operating room with built-in MRI and CT scanners

