

## Stimulating the brain: moral concerns about deep-brain stimulators

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### Essential Tremor (ET)

The most common *movement disorder*  
(compared to Parkinson's, Dystonia)

7.01 million cases in the US.

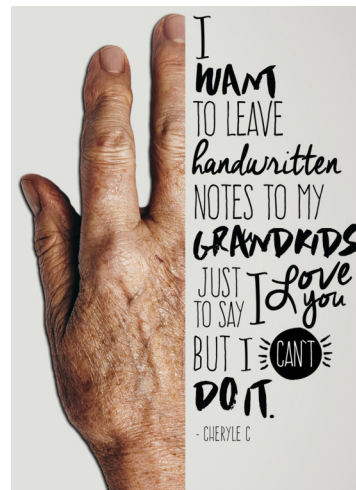
Features:

- \* Involuntary tremor in the hands, feet, and head.
- \* Typical onset in 40's-50's.
- \* Progressive.

Treated with:

- \* Propranolol (beta-blocker)
- \* Primadone (anticonvulsant)

We don't understand it.



International Essential Tremor Association (IETA), [essentialtremor.org](http://essentialtremor.org)

## Parkinson's Disease (PD)

1 million cases in the US.

Four signs / symptoms:

- \* Tremor
- \* Bradykinesia (slow movement)
- \* Rigidity and stiffness
- \* Poor balance

Features:

- \* Typical onset in 50s-60s.
- \* Progressive (and often fatal)

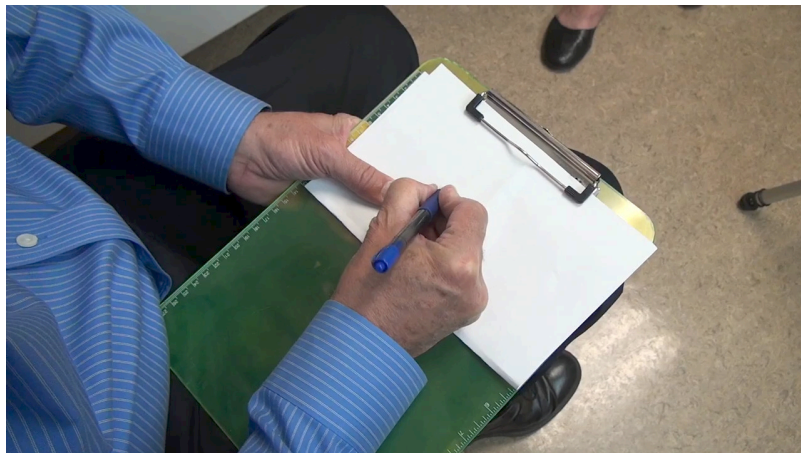
Treated with:

- \* Levodopa
- \* Carbidopa



National Parkinson's Foundation, <http://www.parkinson.org>

## Essential Tremor (ET)



Barrow Neurological Institute, <https://www.BarrowNeuro.org/DBS> / <https://www.youtube.com/watch?v=FsON79DZIW0>

## Deep Brain Stimulation (DBS)

"Pacemaker" device in chest applies current to electrodes implanted in brain.

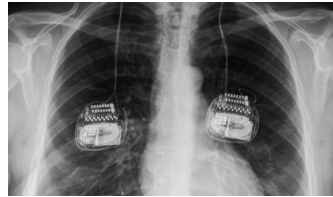
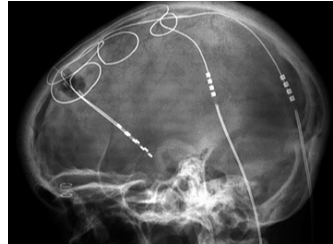
Over 100,000 units in use for Essential Tremor, Parkinson's, and Dystonia.

### Benefits:

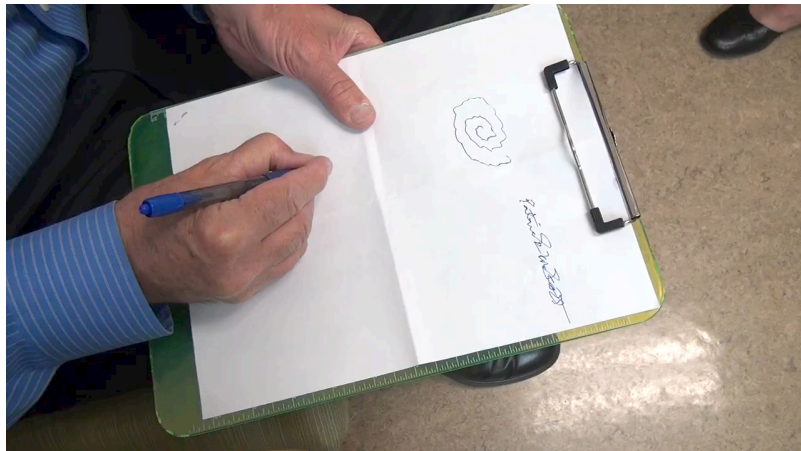
- \* Fewer pharmaceuticals necessary.
- \* Minimal damage, (maybe) reversible.

### Drawbacks:

- \* Side-effects (dyskinesias, slurred speech, induced hypomania).
- \* Battery replacement requires surgery. (Every 3-5 years.)
- \* Personality/Behavioral Changes



## Deep Brain Stimulation (DBS)



Barrow Neurological Institute, <https://www.BarrowNeuro.org/DBS> / <https://www.youtube.com/watch?v=FsON79DZIW0>

## DBS' psychological / social impact

Yves Agid (et. al.) asked 29 DBS users with Parkinson's about their life with DBS.

Self-image problems:

- \* Still expecting symptoms: "...my body is cured but my mind is still sick."
- \* "I feel like a 'Robocop'" — "I'm an electronic doll"



Loss of control:

- \* "'I'm under remote control'."
- \* "I feel I'm forced to live like a prisoner in an alien body that's out of control"

Relationship changes:

- \* "When he was ill, we were the perfect couple. Since the operation, he wants to live like a young man: going out, meeting new people...It's unbearable! I prefer him as he was before, always nice and quiet."

## How do we explain these changes?

What do we call these changes?

- \* Maladaptation?
- \* Authenticity?
- \* Self-narratives?

Is DBS a *threat* to the people who use it? What is threatened?

- \* Identity? ("Am I the same person I was before surgery?")
- \* Autonomy? ("Is the implant coercing me?")
- \* Agency? ("Is this me acting? Or is it the implant?")

**Let's think about a (real life) case**

- \* A man cannot walk or talk because of Parkinsonian Tremor.
- \* Drugs don't help enough.
- \* He decides to try DBS as a last resort.
- \* DBS is a really big help. He can walk and talk again.
- \* He has a side-effect: severe mania.
- \* He must choose between: tremor and mania.

**Questions**

- \* What would you decide?
- \* Is this personality change an identity change?
- \* Should the patient make their decision with the stimulator on or off?
- \* How much of a say should his family members get?

### **It only gets more complicated from here...**

Researchers want to use DBS to treat mental illness:

- \* Major Depressive Disorder (MDD)
- \* Obsessive Compulsive Disorder (OCD)
- \* Generalized Anxiety Disorder (GAD)
- \* Drug addiction

Are the moral problems worse when we use them for psychiatry?

What are the (moral) limits to using DBS to treat things?

### **Let's think about another (real life) case**

- \* You are a neurosurgeon.
- \* Your patient has OCD and Anxiety, and drugs don't help.
- \* She decides to try DBS as a last resort.
- \* When she uses it, she finds it doesn't help with her obsessions and compulsions.
- \* But it does make her feel euphoria when it's on.
- \* She wants to keep the stimulator on.
- \* She thinks it will help her deal with her situation.

### **Questions**

- \* Is it okay to keep using DBS this way? What would tell your patient to do?
- \* Would it be different if the patient's condition were different? What if she had depression?
- \* Would it be okay if the treatment were less invasive?
- \* Is there any difference between recreational drugs and DBS here?