An Overview of Parkinson's Disease

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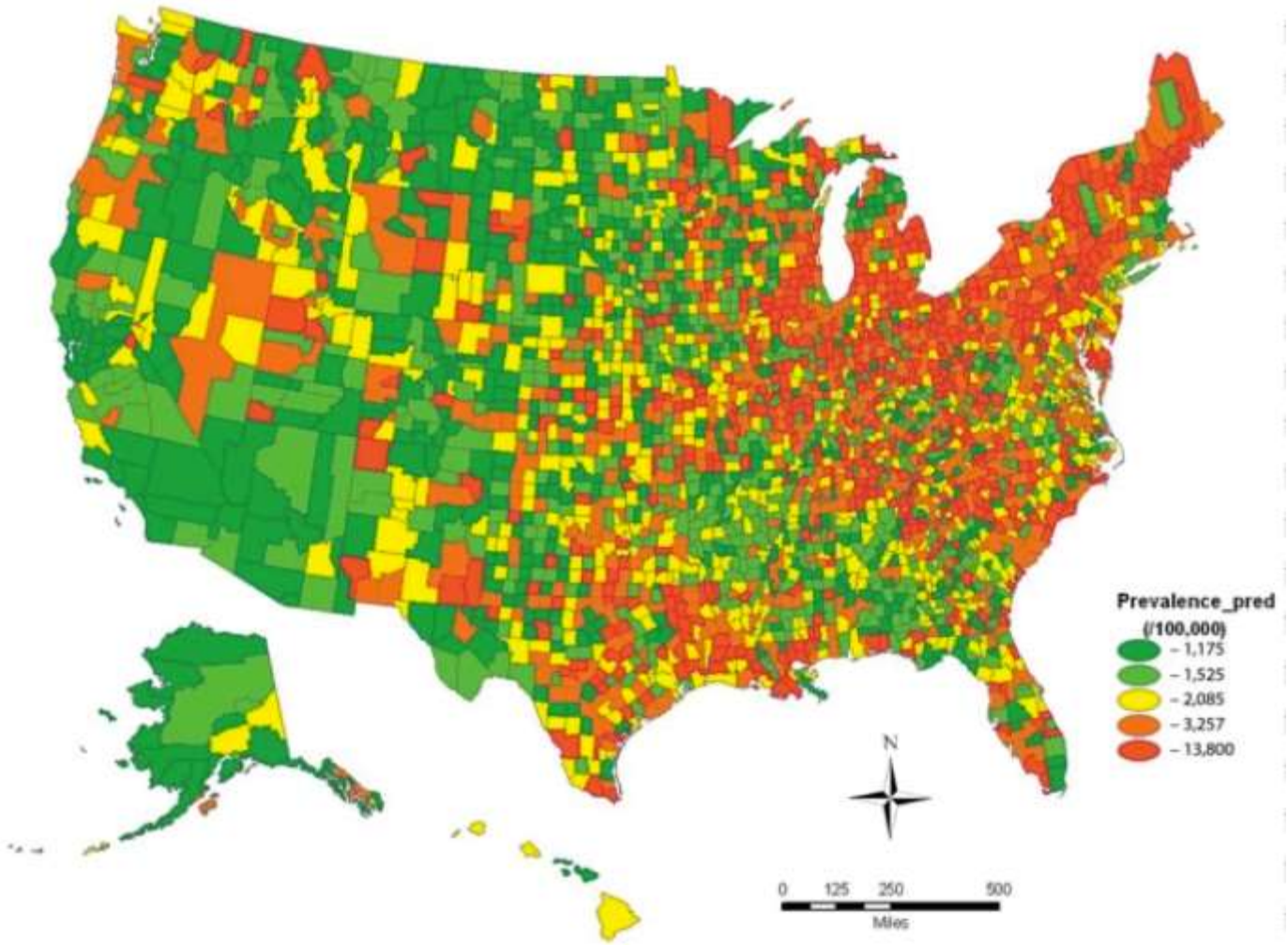
Epidemiology of PD

- 2nd most common neurodegenerative disorder after Alzheimer's
- 1-2% of the population over 60 years (increasing over time)
- Combination of genetic and environmental components
- Lower risk of PD associated with coffee/tea consumption, smoking and alcohol
- Higher risk of PD with well-water, herbicide/pesticide exposure, welding and agent orange exposure





Prevalence of PD in the US

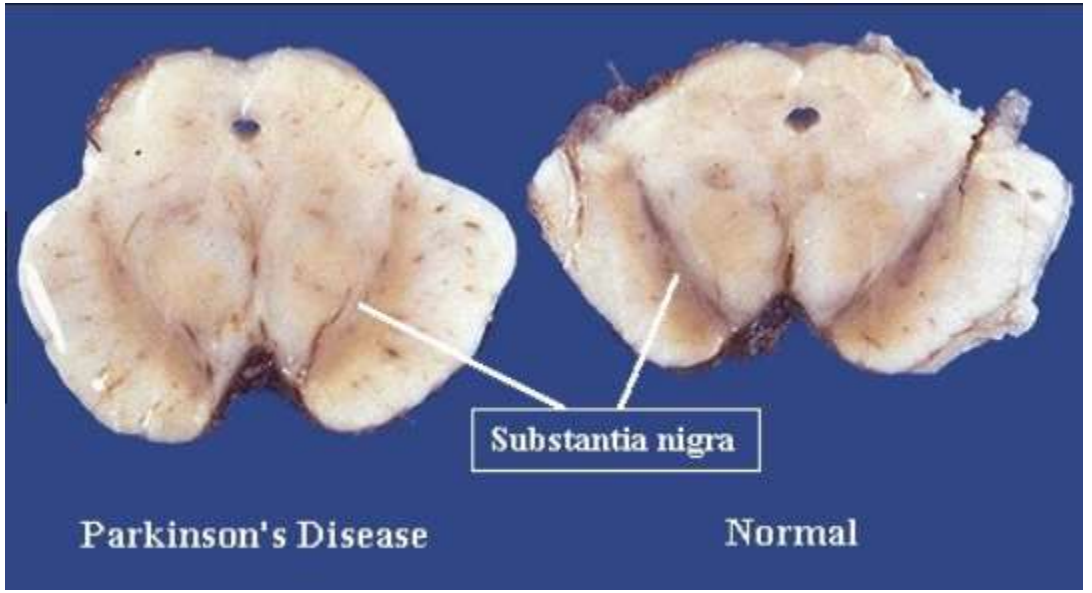


Research from WashU epidemiological study of PD in the US. Reviewed 36 million Medicare records representing 98% of the US population over age 65.

Credit: Neuroepidemiology/S. Karger AG

PD basic reminders

- Decreased dopaminergic cells in the Substantia nigra in midbrain
- Less dopamine leads to less movements
- PD is a hypokinetic movement disorder
- Symptom treatment is commonly aimed at replacing dopamine



4 Cardinal Features of PD

- Tremor
- Bradykinesia
- Rigidity
- Postural instability

Tremor in PD

- Present at rest
- Goes away or improves with action
- Usually worse on one side
- Usually thumb involvement
- sitting with eyes closed and perform mental exercises may bring out a very mild tremor
- Worse when nervous, tired or excited

Bradykinesia

- Not just slowness
- Also irregularity and decreasing amplitude
- Many maneuvers to elicit symptoms
- Usually worse on one side
- Includes hypomimia, dry eyes and drooling

Rigidity

- Classically described as “cogwheel”
- Check multiple joints at once with rotational movement
- Usually worse on one side
- May need to activate contralateral side to feel

Postural instability

- Lose ability to reflexively catch self
- Assessed with pull test
- Major cause of falls and loss of mobility

Other common gait problems

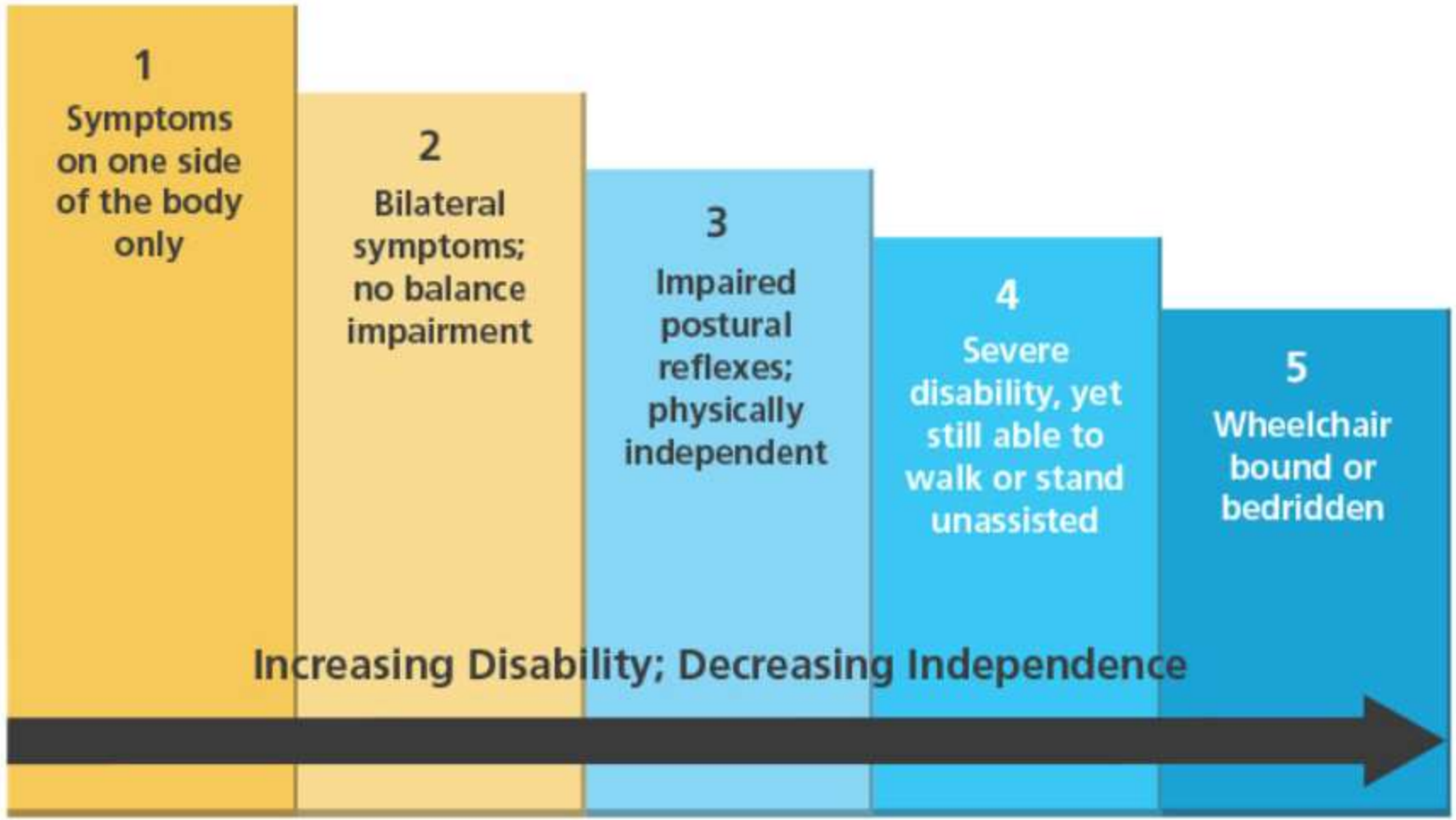
- Freezing of gait
- Tripping over low objects
- Slowing of gait
- Asymmetric arm swing

Different flavors of idiopathic PD
“idiopathic”= regular/run of the mill

- Akinetic rigid (may not have any tremor at all)
- Tremor predominant
- some genetic cases have particular characteristics
- Gait may be the primary issue in some cases

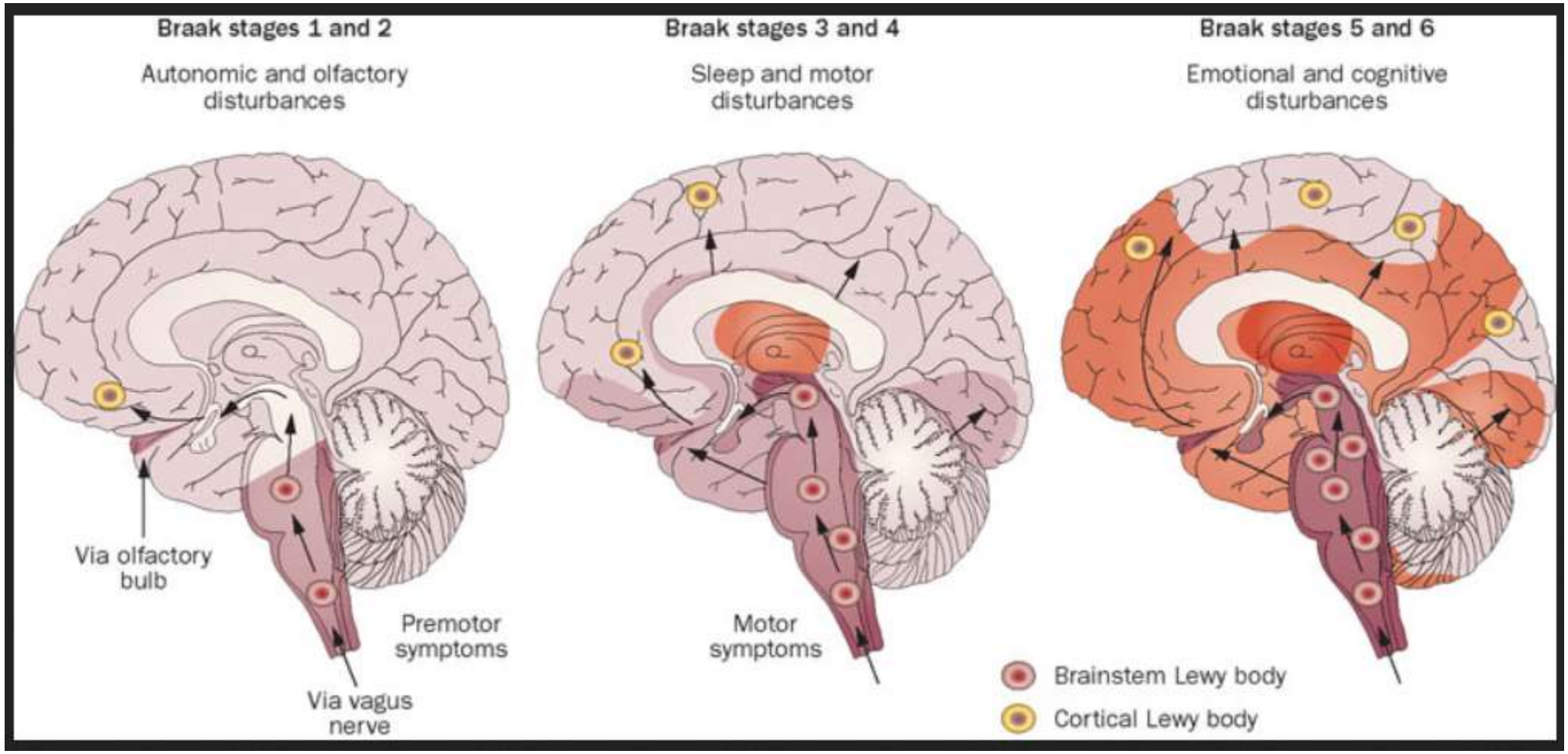
Red flags that this is not idiopathic PD

- Early falls
- Very symmetric symptoms
- Early dementia (within 1-3 years)
- Autonomic dysfunction
- Eye movement problems
- Unresponsive to typical PD meds
- Abnormal brain imaging findings
- Abnormal lab findings
- Use of antipsychotics



Hoehn and Yahr Staging

Non motor symptoms in PD



Sleep disturbances

- Unable to fall or stay asleep
- Day time sleepiness
- Sundowning
- REM behavior sleep disorder

Sleep disturbances

- PD patients may not respond well to typical sleep aids
- Avoid benadryl or “PM” versions of OTC meds
- Avoid zolpidem etc.
- First line should be melatonin (taken 2-3 hrs before desired bedtime)
- Second line clonazepam (especially useful for RBD)

Constipation

- A “regular” complaint in PD patients
- Often precedes PD motor symptoms
- Theories that PD starts in the gut
- Standard recommendations apply:
  - Increase H2O
  - High fiber
  - Miralax and stool softeners before stimulants
  - Severe cases may require referral to GI

Dementia

- About 30% of PD patients develop dementia
- Dementia within first year of motor symptoms is a red flag
- Common complaints of word finding or multitasking difficulty
- Neuropsych testing may be useful for pattern of deficits
- At least annually should have in office screening
- Family is usually the most helpful in identifying problems
- Consider driving safety and any use of heavy equipment

Treating dementia in PD

- Consider exacerbation from current meds
- Acetylcholinesterase inhibitors first line
- Donepezil, rivastigme, galantamine
- Memantine (often added in AD when symptoms become moderate) has not been shown to be efficacious in PD
- Participation in brain teaser type activities “active mind” and maintaining social connections is also important

Hallucinations

- Presence hallucinations and well formed visual hallucinations
- Having hallucinations = PD psychosis
- Always consider medication effects first
- Taper off dopamine agonists, amantadine, artane first
- Sinemet and MAO-B inhibitors less common culprits
- Pimavanserin (Nuplazid) was approved May 2015, FIRST LINE
- Second line: seroquel

Hallucinations

- **Absolutely no Haldol EVER in PD patients!!!**

- **Haldol and other typical antipsychotics block dopamine and can severely worsen PD symptoms causing neuro malignant syndrome**

Autonomic dysfunction

- Dizziness on standing, urinary symptoms and sexual dysfunction
- Bring these issues up with you physician!
- Formal autonomic reflex screen may determine severity
- Severe autonomic dysfunction may be suggestive of multiple systems atrophy
- Treat symptomatically

Autonomic dysfunction

- Symptomatic treatment
- Compression stockings and increased fluids for orthostatic hypotension (OH)
- Droxidopa (Northera), midodrine, florinef for persistent OH
- Urinary exercises may be useful (available by online search)
- Typical medical treatment for ED but with reminder that these meds may worsen dizziness
- Referral to specialist may be needed

Common Medications for PD

- Current medication options are for symptom treatment only
- We do not have any medication to slow disease progression

Levodopa

- Carbidopa/levodopa IR and Carbidopa/levodopa CR
- Rytary
- Levodopa intestinal gel
- Inhaled levodopa
- Future subcutaneous levodopa pump

- Nausea, dizziness, orthostatic hypotension, dyskinesias
- May improve or worsen gait, dystonia, cognition

Dopamine agonists

- Pramipexole
- Ropinirole
- Rotigotine

- Impulse control disorders, hallucinations, swelling




MAO-B Inhibitors

- Rasagiline
- Selegiline
- Salfinamide (new)

- Many physicians believe this class of medication may slow the progression of Parkinson’s disease but the evidence is weak

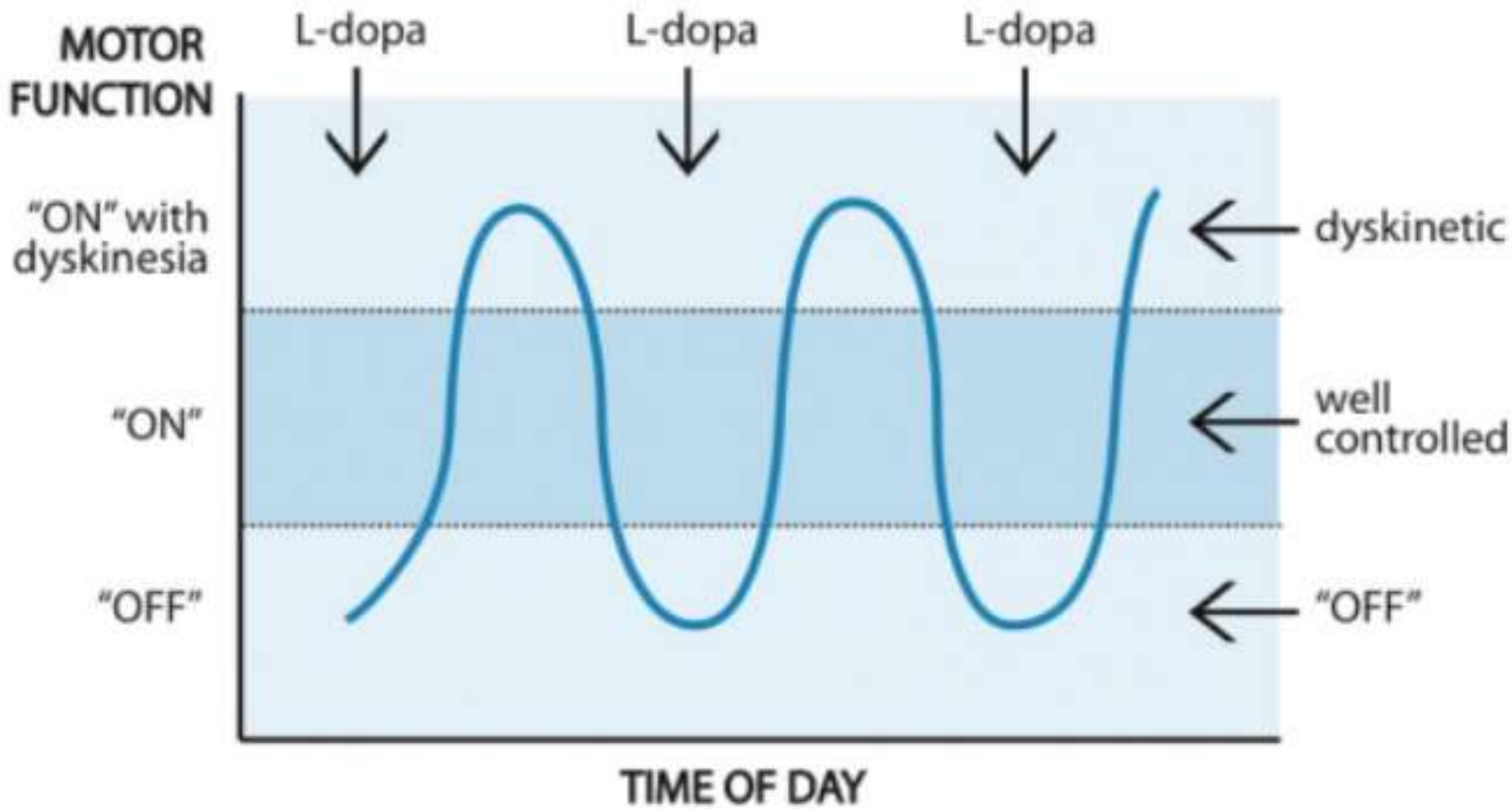
Exercise and Physical Therapy

- Exercise MAY slow the progression of PD!!!
- Physical activity is extremely important in PD
- Delay the disease, LSVT Big&Loud programs, Rock steady

Advanced PD

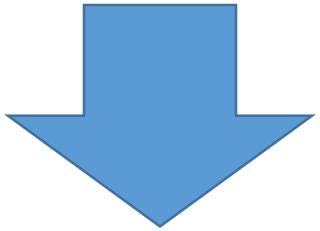
- more motor complications and fluctuations
- Roller coaster ride of motor symptoms
- Failed medication doses
- Worsening mobility

- Basically routine care is not providing acceptable quality of life


MOTOR FUNCTION
L-dopa
L-dopa
L-dopa
"ON" with dyskinesia
"ON"
"OFF"
dyskinetic
well controlled
"OFF"
TIME OF DAY

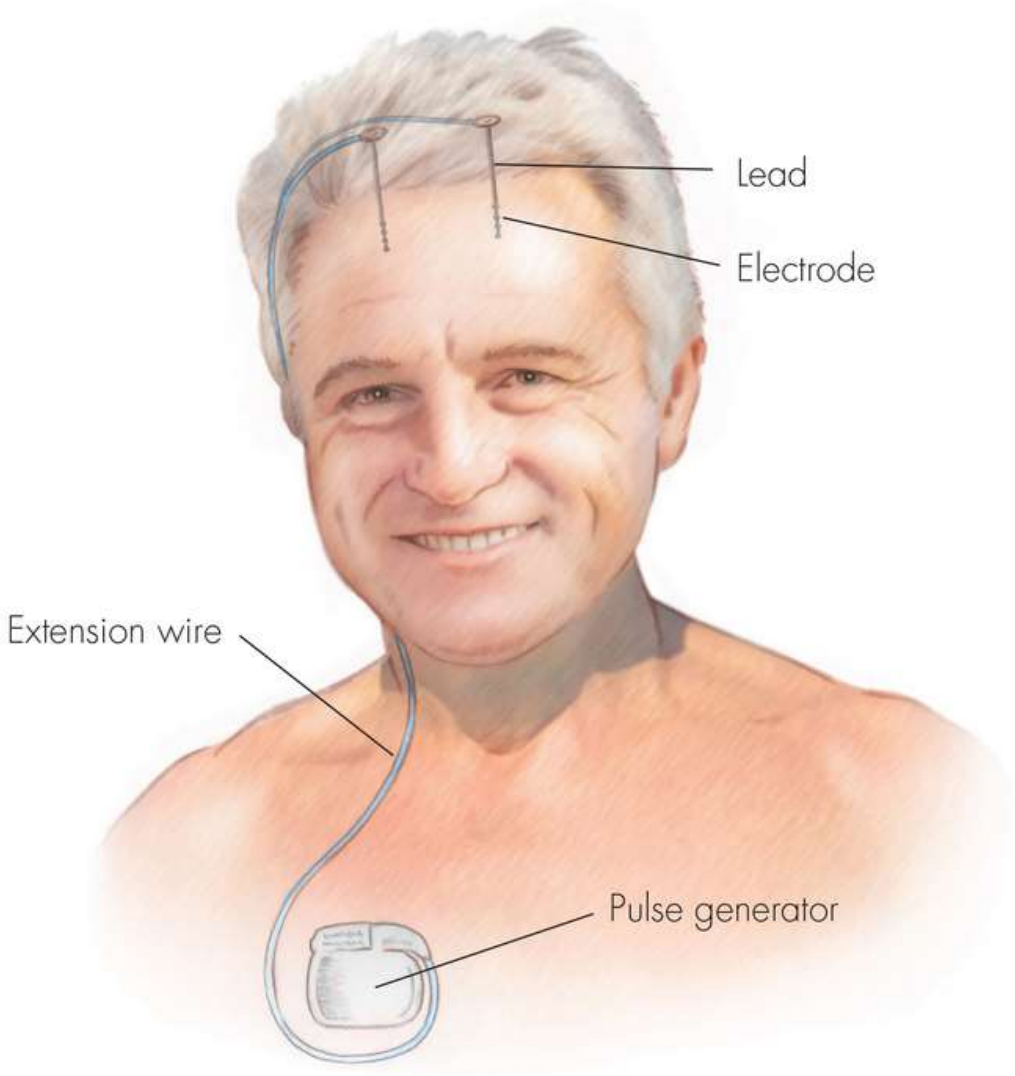
Goals for advanced PD patients

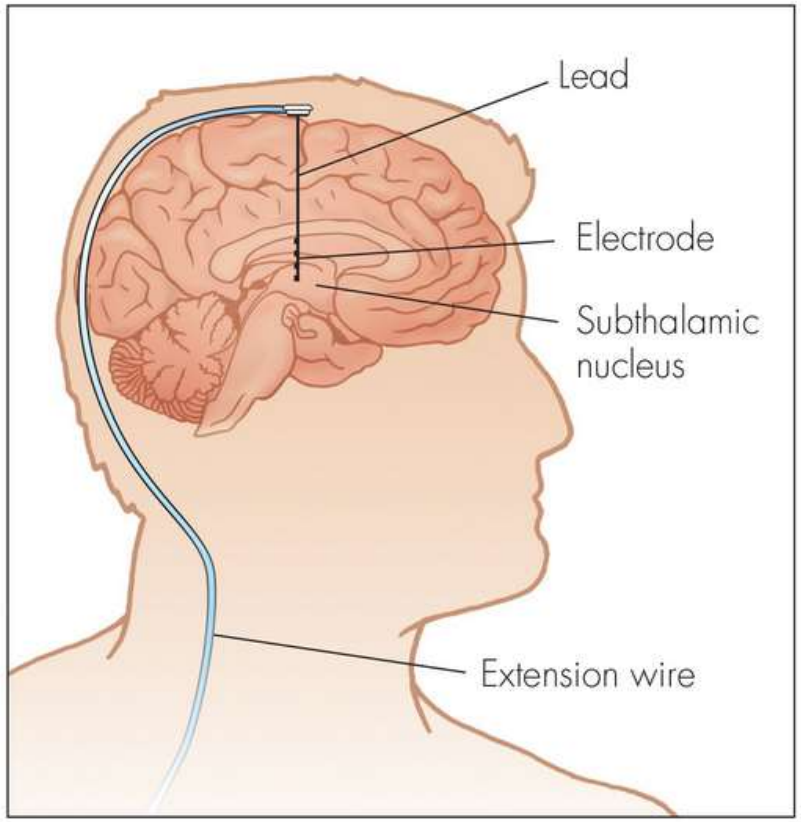
- Maintain independence
- Maintain mobility
- More ON time without troublesome dyskinesias
- Less OFF
- Smooth out motor symptoms



- Rytary, Deep Brain stimulation, Levodopa Intestinal gel

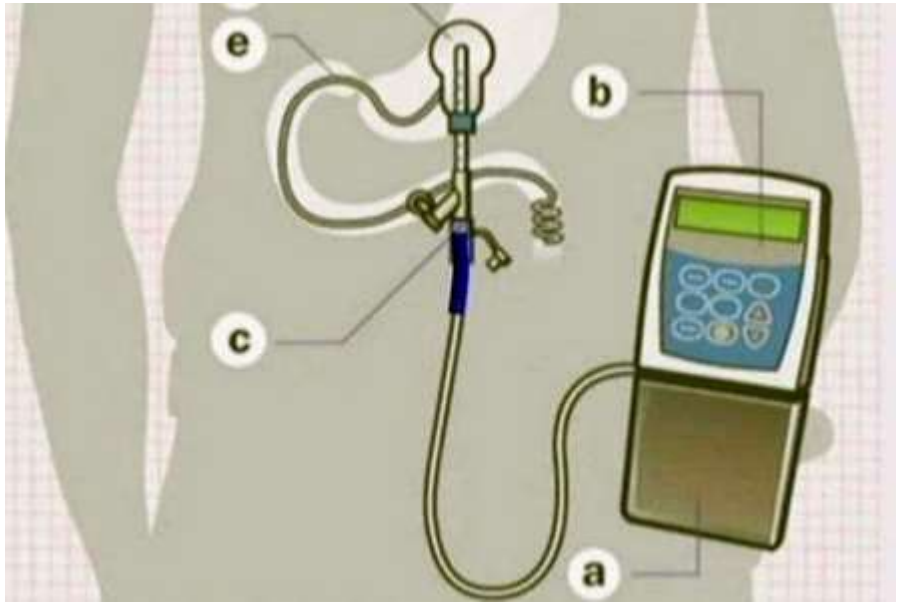
Deep Brain Stimulation





Note: Wire and electrodes are under the scalp.

Carbidopa/Levodopa intestinal gel



Positives

- Less invasive than DBS
- Quick recovery
- May be better for in case of dementia
- Continuous drug delivery
- Improves motor fluctuations

Negatives

- Large
- Complications from insertion
- Must keep supply refrigerated
- Vitamin deficiencies?
- Peripheral neuropathy?
- Levodopa side effects

Ongoing research for stopping disease progression

- Uric acid levels (SUREPD study)
- DBS and disease progression, DBS for early onset PD
- Immunotherapy
- Isradipine

Holy grail of PD research