



Welcome and Overview

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Parkinson's Preceptorship Program
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Disclosures

“Neither I nor my spouse/partner has a relevant financial relationship with a commercial interest to disclose.”

What would you like to know?

Vs what we think you want/need to know.

Pre-test question 1: Symptoms

- What muscular problems does Parkinson's disease cause?
 - ☐ Weakness
 - ☐ Slowness
 - ☐ Falling backwards
 - ☐ Motor fluctuations

Pre-test question 1: Symptoms

- movement control
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Pre-test question 2: Symptoms

- Symptoms: Which kind of tremor do PD patients have?
 - ☐ Action tremor
 - ☐ Rest tremor
 - ☐ Dyskinetic tremor
 - ☐ Not all PD patients have tremor

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Pre-test question 3: Causes

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 - ☐ Dopamine-producing cells die
 - ☐ Pesticides like rotenone
 - ☐ Repeated blows to the head
 - ☐ Certain nausea medications
 - ☐ Genes

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Pre-test question 4: Diagnosis

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 - ☐ Trial of carbidopa/levodopa
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Pre-test question 5: Treatment

- What are common side effects of PD meds?
 - ☐ Sedation
 - ☐ Insomnia
 - ☐ Obsessive devotion to hobbies
 - ☐ Hallucinations and delusions
 - ☐ Dyskinesia

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Dyskinesia and the power of medication



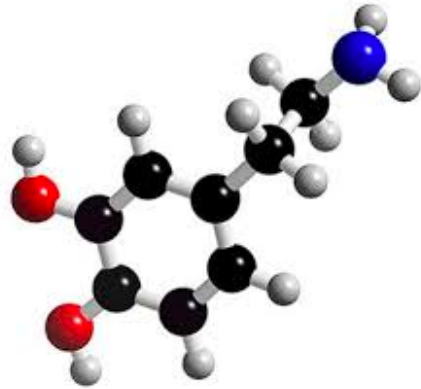
Movement disorder neurology practice

- Specialty practice in tertiary care center
 - More specialized
 - Lower clinical load, more time with patients
 - Research focus
 - Early adopters
- Community/OSH neurologist

PD vs COVID

- PD pts are COVID high risk, because of lung issues: aspiration, stiff chest muscles hinder cough.
- Effects of quarantine for PD
- Video visits for PD
 - In-person visits are energetically expensive
 - How important is the physical exam?
 - DBS adjustments

PD and dopamine



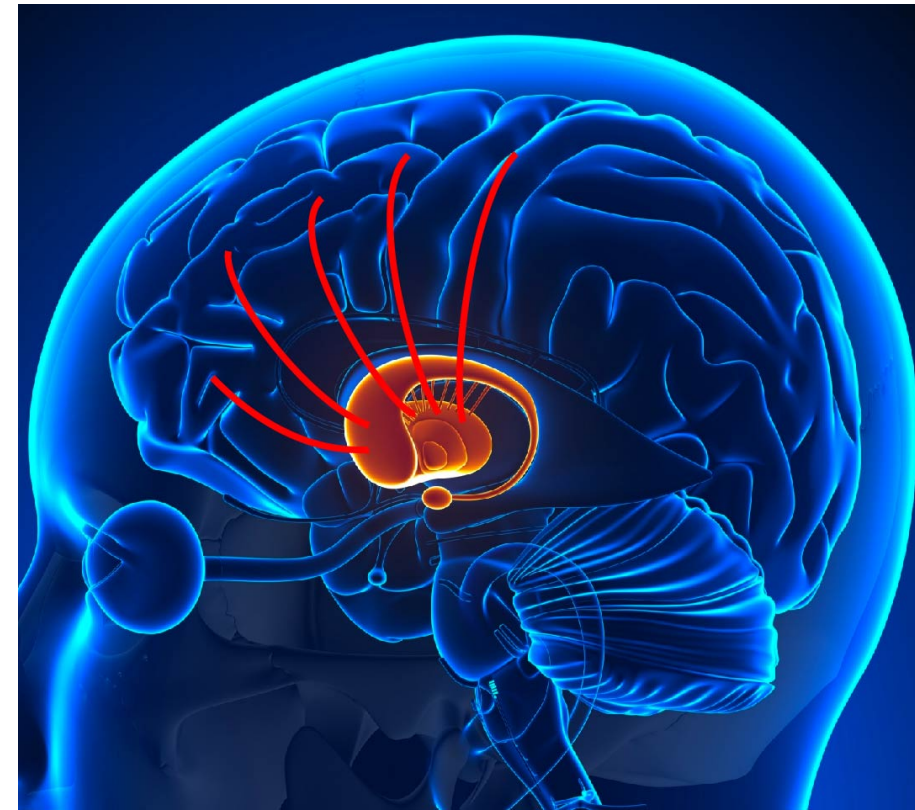
- PD symptoms are (primarily) symptoms of low dopamine
 - Low motivation, imagination, and some autonomic symptoms
- PD treatment can cause symptoms of too much dopamine
 - Low dopamine causes dopamine receptor hypersensitivity
 - PD dopamine hypersensitivity causes overreaction to PD meds

PD: disorder of action

- Basal ganglia diseases: PD, Tourette's, Huntington's, dystonia...
- Lesions affect starting, stopping, speed
 - (vs. weakness or paralysis)
- Disorder of voluntary action = disorders of will
 - PD pts are often accused of "just not trying"
- Involuntary muscles controlling BP, HR, sweating, breathing, urine, stool



Striatum sends much info to motor areas



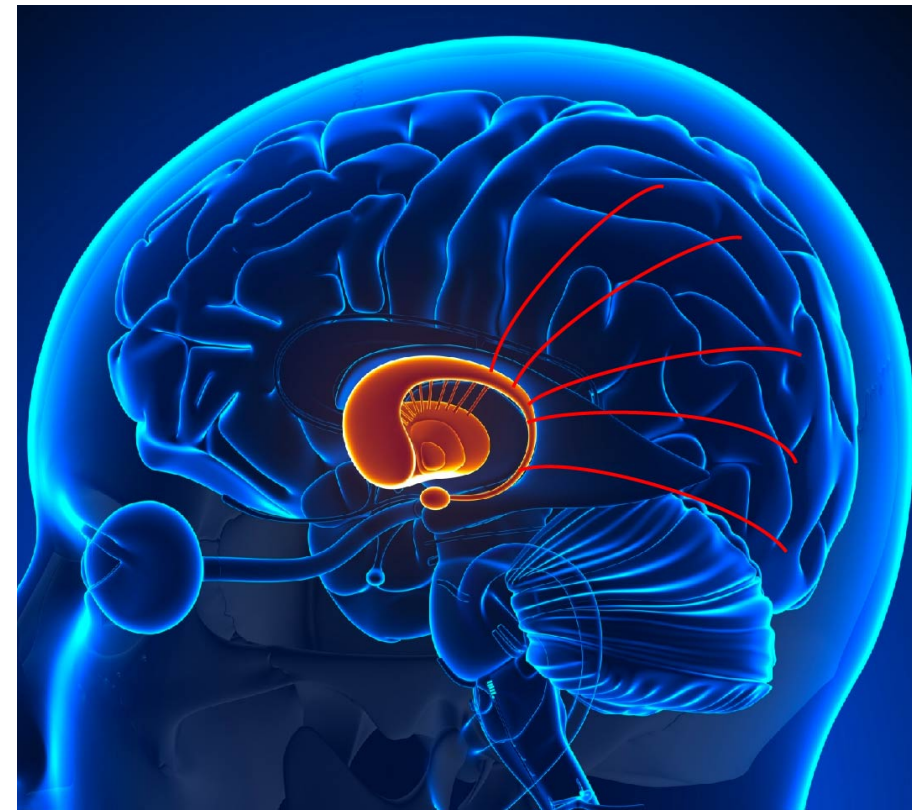
PD and the nature of illness

- Illness is involuntary, weakness is a choice?
 - The boundaries of blame
 - “Am I sick, or just not trying?”
 - “I cannot” vs “I will not” vs “I cannot will”
- How can we think about illnesses that affect our ability to “try”?
 - Addictions, obesity, “lifestyle illnesses,” depression....
 - PD’s legitimacy may help us reframe those

PD: disorder of perception?!

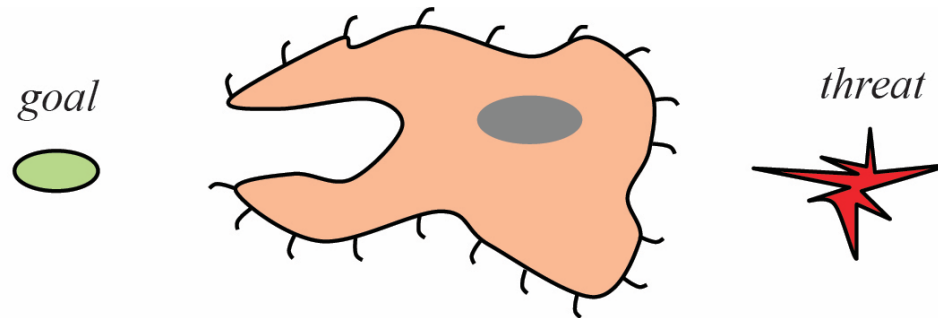
- Dopamine's effect on perception:
 - Too little: dulled, disorganized
 - Just right: good signal/noise balance
 - Too much: over-detailed, over-vivid
 - This can cause hallucinations, delusions
 - Boosting dopamine can give sensory areas too much while motor cortex is still underdosed

Caudate tail sends info to sensory areas



PD hurts goal-directed > fear driven-motivation

Approach



Avoidance

All animals, even amoebas, have two motivation systems

Approach system	Avoidance system
Excess: addiction	Excess: OCD
Deficit: apathy	Deficit: recklessness
High dopamine	Low serotonin

Drug effects on approach vs avoidance

- Dopamine boosters foster goal-seeking behavior, including addictions
- Dopamine blockers decrease positive motivation
 - Includes some nausea meds, e.g. Reglan, Compazine
- Serotonin-boosting drugs (SSRIs) e.g. Prozac decrease avoidance
- But \uparrow serotonin \rightarrow \downarrow dopamine, so SSRIs can lower goal drive
 - SSRIs can (reversibly) worsen PD symptoms
 - SSRIs can cause apathy in non-PD depressed patients
 - Treated by adding meds that raise dopamine, eg Wellbutrin

Motion ↔ Emotion

- Basal ganglia are important for mood as well as movement
- Depressed pts often look parkinsonian, & vice versa
- Manic patients get dyskinetic, impulsive, like overtreated PD
- Depression is a risk factor for PD, and vice versa

PD affects self-generated > cued movement

- E.g PD hurts golf > skiing
- Basal ganglia suppress our response to expectations (cued mvt)
 - So PD boosts placebo effects
- Willpower is a scarce resource for all of us
 - Use cues, habits to conserve it.
- Spectrum of dopaminergic tone in the general population

PD personality: “He’s always been like that”

- Low dopamine >20y before sx start
- Conscientious, med-compliant
- Sober—less substance abuse
- Risk-averse
- People in sedate professions have higher PD risk
- But -- be careful when generalizing

Pope John Paul II,
Parkinson’s personality?



Causes of suffering in PD

- **Patients:**
 - **Motor disability:** PD can disrupt work, hobbies, walking from room to room, dressing, eating, talking
 - **Cognitive disability:** low motivation, executive dysfunction
 - **Physical pain:** tight shoulders/back, accidental injuries
 - **Emotional pain:** both reactive and primary depression
 - **Shortened life:** pneumonia; choking; car/machinery accidents
- **Home caregivers:** overwork, income loss, physical injury, burnout
- **Society:** losing pt +/- caregiver from the workforce; healthcare costs.
 - Problem: tertiary gain to healthcare industry: we make money off sick people

But PD has MANY good treatments

- **Medications**

- Levodopa:
 - Oral
 - Intestinal pump
- COMT inhibitors
- MAOB inhibitors
- Dopamine agonists
 - Oral
 - Skin patch
- Anticholinergics
- Antidyskinetics
- (Marijuana? No.)

- **Exercise**

- **PT & OT**

- **Surgery**

- Deep brain stimulation
- Focused ultrasound





Questions?

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