A photograph of the Cleveland Clinic Lou Ruvo Center for Brain Health building. The building is modern with a curved facade and large windows. The text "Cleveland Clinic Lou Ruvo Center for Brain Health" is visible on the building's exterior. The scene is set outdoors with green trees and a clear sky.

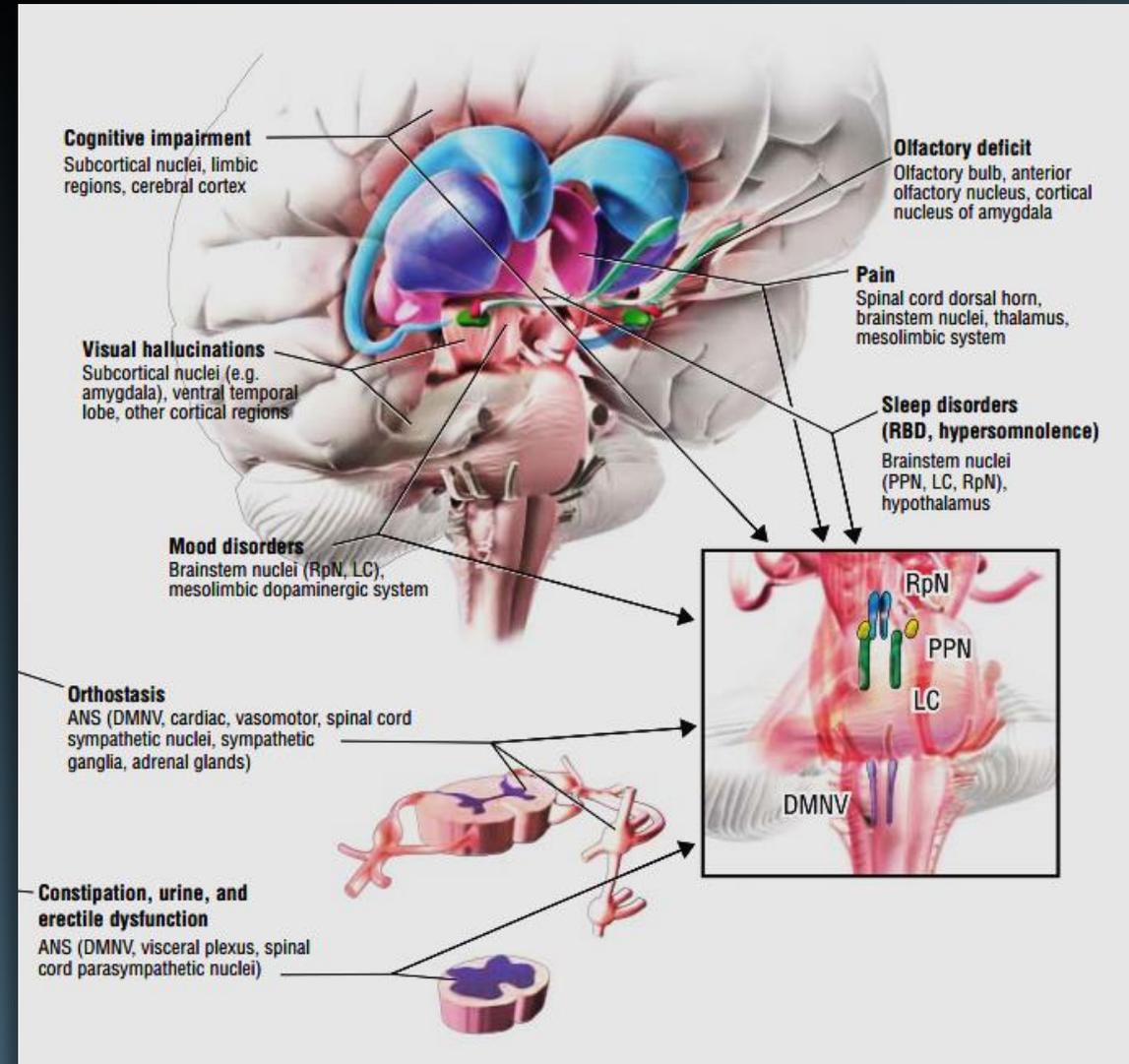
PARKINSON DISEASE AFFECTS HOW WE THINK AND ACT, AND EVEN WHAT WE SEE

Dylan Wint, MD

Cleveland Clinic Lou Ruvo Center for Brain Health

PARKINSON DISEASE: MORE THAN MOVEMENT

- Damage to brainstem nuclei
- Reduced neurotransmitters
 - Dopamine
 - Serotonin
 - Norepinephrine
 - Acetylcholine



TODAY'S AGENDA

- **How we think**
 - Cognitive changes
 - Dementia
- **How we act**
 - Depression
 - Apathy
 - Impulses and compulsions
- **What we see**
 - Illusions
 - Hallucinations

HOW WE THINK—COGNITIVE CHANGES

○ Causes

- Synuclein (Lewy bodies) in cortex
- Amyloid plaques and tau tangles, somewhat like Alzheimer disease

○ Symptoms that occur in many people

- Slower thinking
- Poor attention and concentration
- Difficulty multi-tasking
- Trouble with complex reasoning

○ Dementia—disabling cognitive problems (30-40%)

HOW WE THINK—COGNITIVE CHANGES

○ Prevention

- Healthy brain habits
- Treatment of PD does not prevent cognitive changes

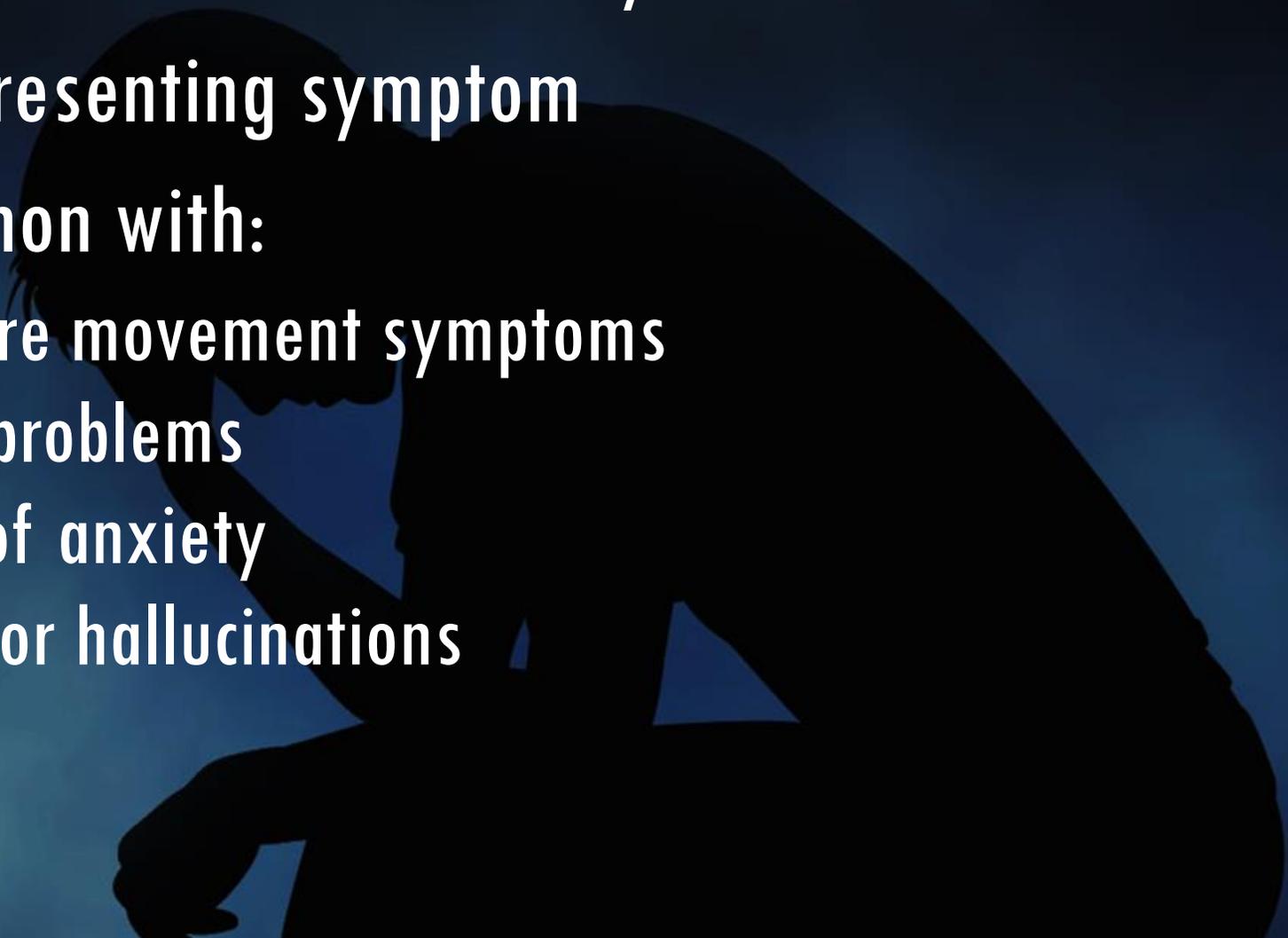
○ Treatments

- Change environment and habits
 - Reminders
 - Slow down and reduce multitasking
 - Occupational therapy
- Optimize motor treatment
- Cognitive medication—rivastigmine/Exelon (cholinesterase inhibitor)

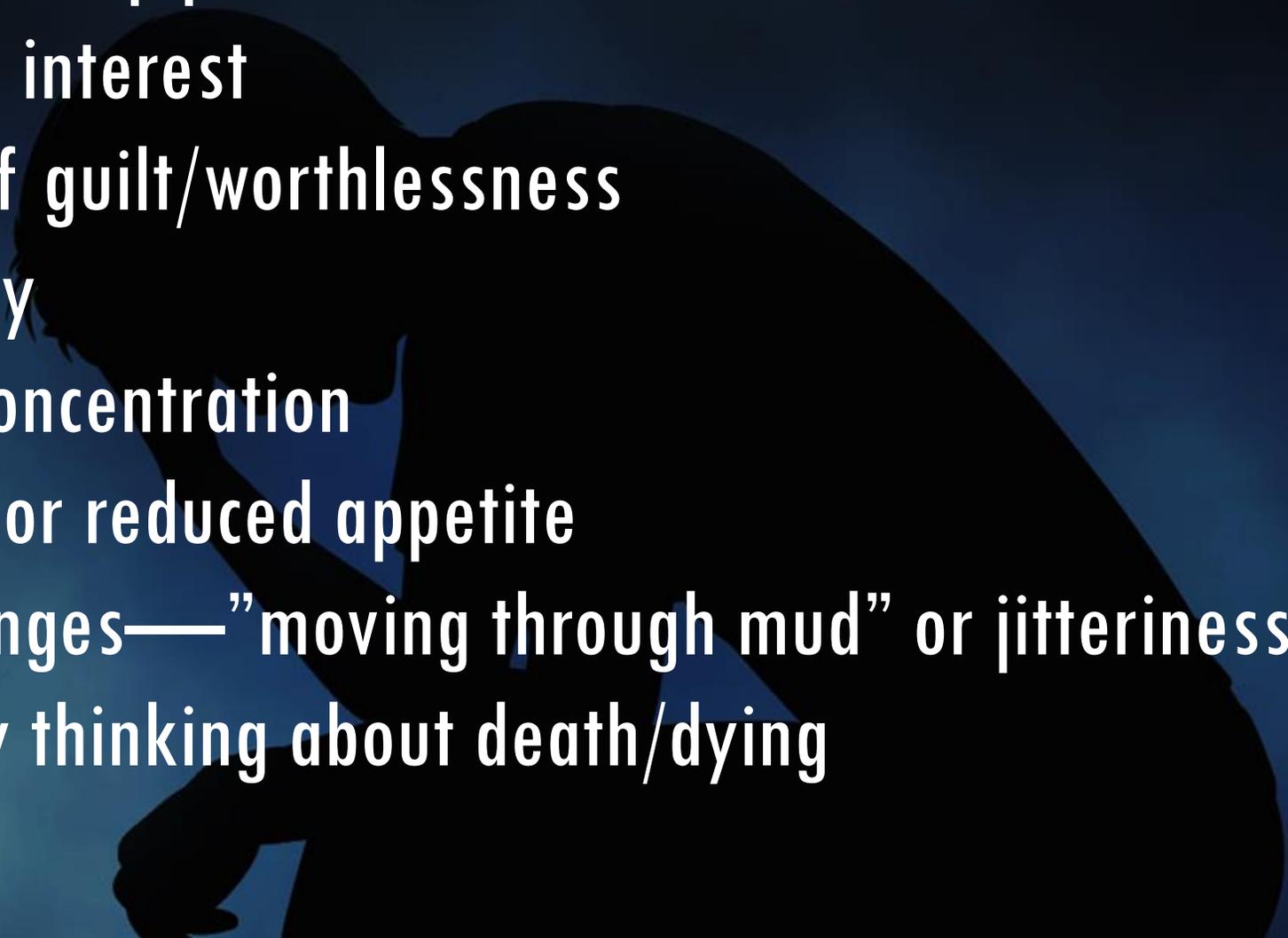
HOW WE ACT—MOOD AND BEHAVIOR

- Directly related to neurotransmitter changes
- Can sometimes be early symptoms
- Common syndromes
 - Mood changes and major depressive disorder
 - Apathy
 - Impulse control disorders

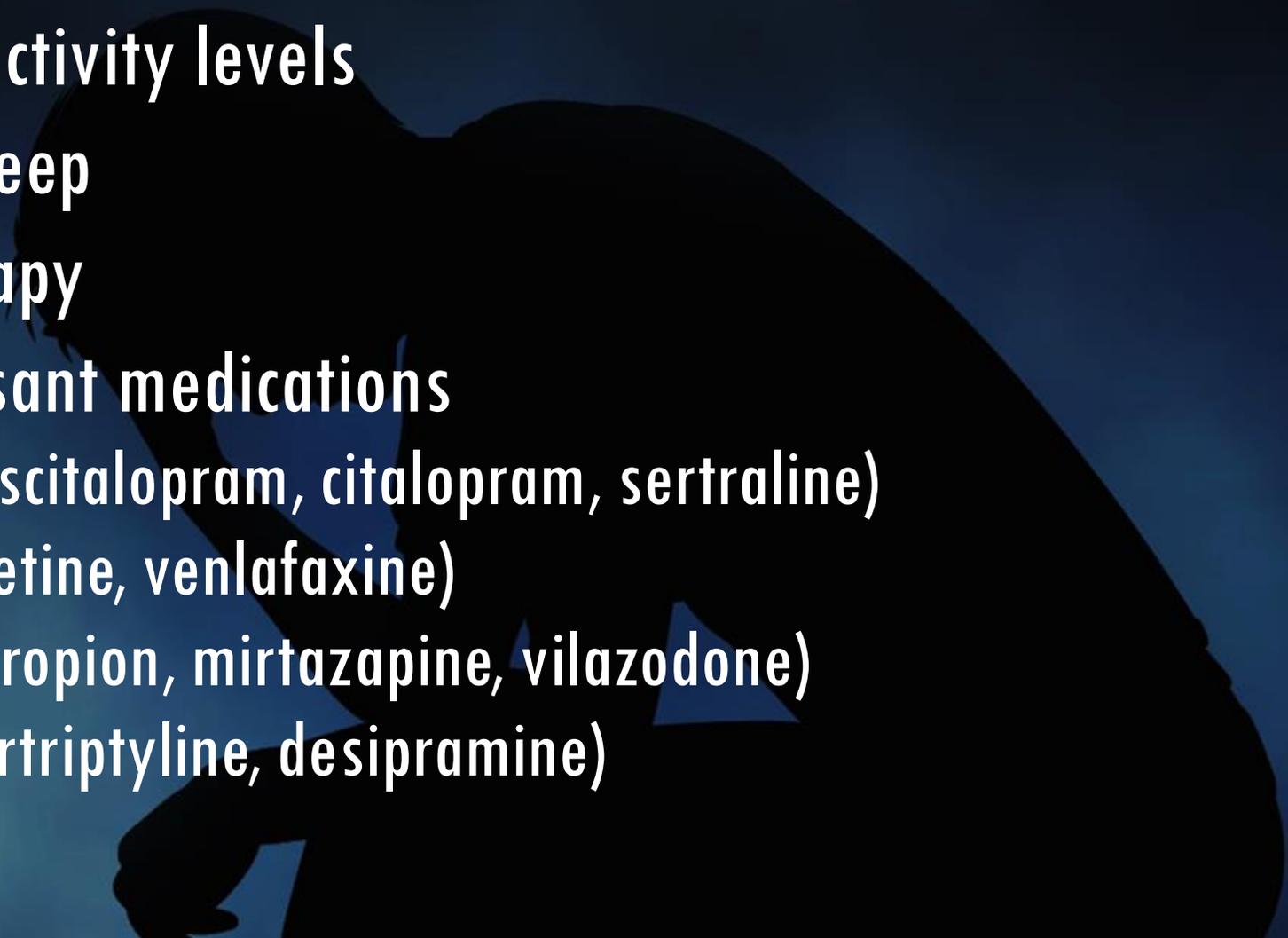
DEPRESSION IN PARKINSON DISEASE

- The most common behavioral syndrome in PD
 - Can be a presenting symptom
 - More common with:
 - More severe movement symptoms
 - Cognitive problems
 - Presence of anxiety
 - Delusions or hallucinations
- 
- A dark silhouette of a person sitting at a desk, leaning forward with their head resting on their hand, suggesting a state of depression or distress. The background is a gradient of dark blue.

DEPRESSION IN PARKINSON DISEASE

- Change in sleep pattern
 - Decreased interest
 - Feelings of guilt/worthlessness
 - Low energy
 - Reduced concentration
 - Increased or reduced appetite
 - Motor changes——”moving through mud” or jitteriness
 - Frequently thinking about death/dying
- 
- A dark silhouette of a person slumped forward, resting their head on their hand, set against a dark blue background. The person's posture is hunched, conveying a sense of physical exhaustion or emotional distress.

DEPRESSION IN PD—TREATMENT

- Optimize motor symptom treatment
 - Keep high activity levels
 - Get good sleep
 - Psychotherapy
 - Antidepressant medications
 - SSRI (e.g., escitalopram, citalopram, sertraline)
 - SNRI (duloxetine, venlafaxine)
 - Others (bupropion, mirtazapine, vilazodone)
 - Tricyclic (nortriptyline, desipramine)
- 
- A dark silhouette of a person slumped over, their head resting on their hand, set against a dark blue background. The person's posture is slumped, suggesting depression or fatigue. The background is a gradient of dark blue, and the overall tone is somber.

I'D LIKE TO TALK ABOUT APATHY, BUT WHO CARES?

- Occurs in about 50% of people with PD
- Symptoms—decreased goal-directed activity
 - Behavior (responding, starting, sticking)
 - Cognitive activity (thinking and learning)
 - Emotional engagement (lower emotional expression and reactivity)
- Not necessarily depression
- No reliable medication treatments, but stimulants may help

IMPULSE CONTROL DISORDERS

- An effect of increasing brain's dopamine activity
- Can happen with any medicine, but most common with agonists
- Affect 10-15% of people taking dopamine agonists
- Common behaviors—usually associated with “reward”
 - Gambling
 - Shopping/purchasing
 - Sexual activity
 - Eating
- “Punding”—repetitive, stereotyped, useless behaviors

WHAT WE SEE—PERCEPTUAL DISTURBANCES

- Occur in 25-50% of people with PD
- Vexing and persistent
- Associated with
 - Duration of PD
 - Presence of cognitive dysfunction
 - Advanced age
 - Severe motor impairment
 - Other visual problems
 - Dopamine agonist medications

VISUAL PERCEPTUAL DISTURBANCES

○ Illusions

- Distortions of actual sensory input
- Possibly exaggerated form of *pareidolia*

○ Hallucinations

- Generation of an image by the brain
- Associated with delusions (false beliefs)
- Insight declines over time



PERCEPTUAL DISTURBANCES IN PD—TREATMENT

○ Environmental and behavioral

- Proper sleep
- Exercise
- Increase real sensory input
- Reduce ambiguities (good lighting, remove extra objects)

○ Medications

- Cholinesterase inhibitors—rivastigmine, donepezil, galantamine
- Antipsychotic medicines—pimavanserin, clozapine, \pm quetiapine, \pm aripiprazole

CONCLUSION

- Parkinson disease disorders more than movement
- Non-motor symptoms are to be expected
 - Cognitive
 - Behavioral
 - Perceptual
 - Others
- Effective treatments are available
- If you don't tell us, we won't know

