

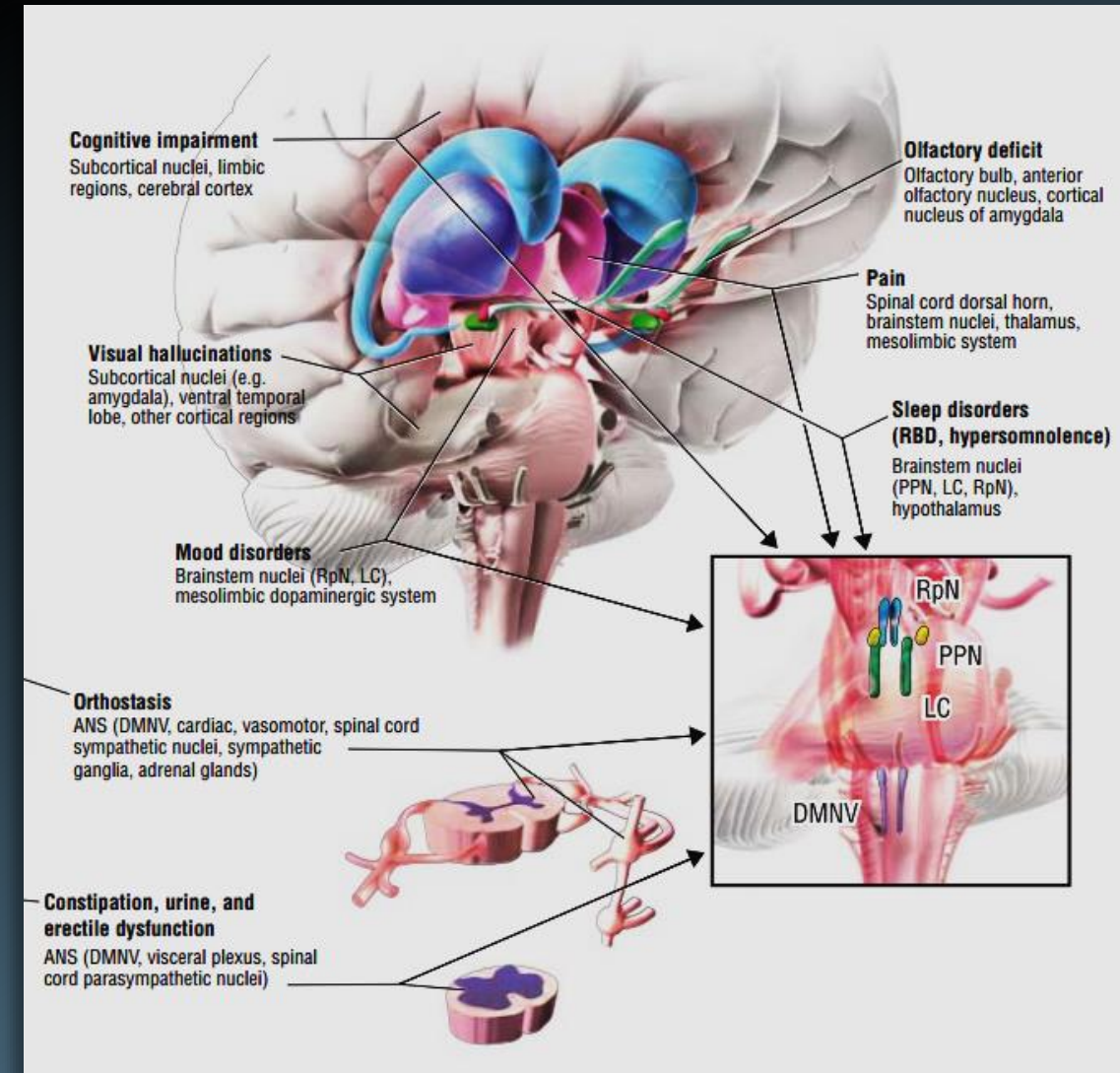
A photograph of the Cleveland Clinic Lou Ruvo Center for Brain Health building. The building is a modern, multi-story structure with a white facade and a large, curved, metallic-looking section on the left. The text "PARKINSON DISEASE AFFECTS HOW WE THINK AND ACT, AND EVEN WHAT WE SEE" is overlaid in large, bold, yellow capital letters. The building is surrounded by greenery, including trees and bushes, under a blue sky with some clouds.

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

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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

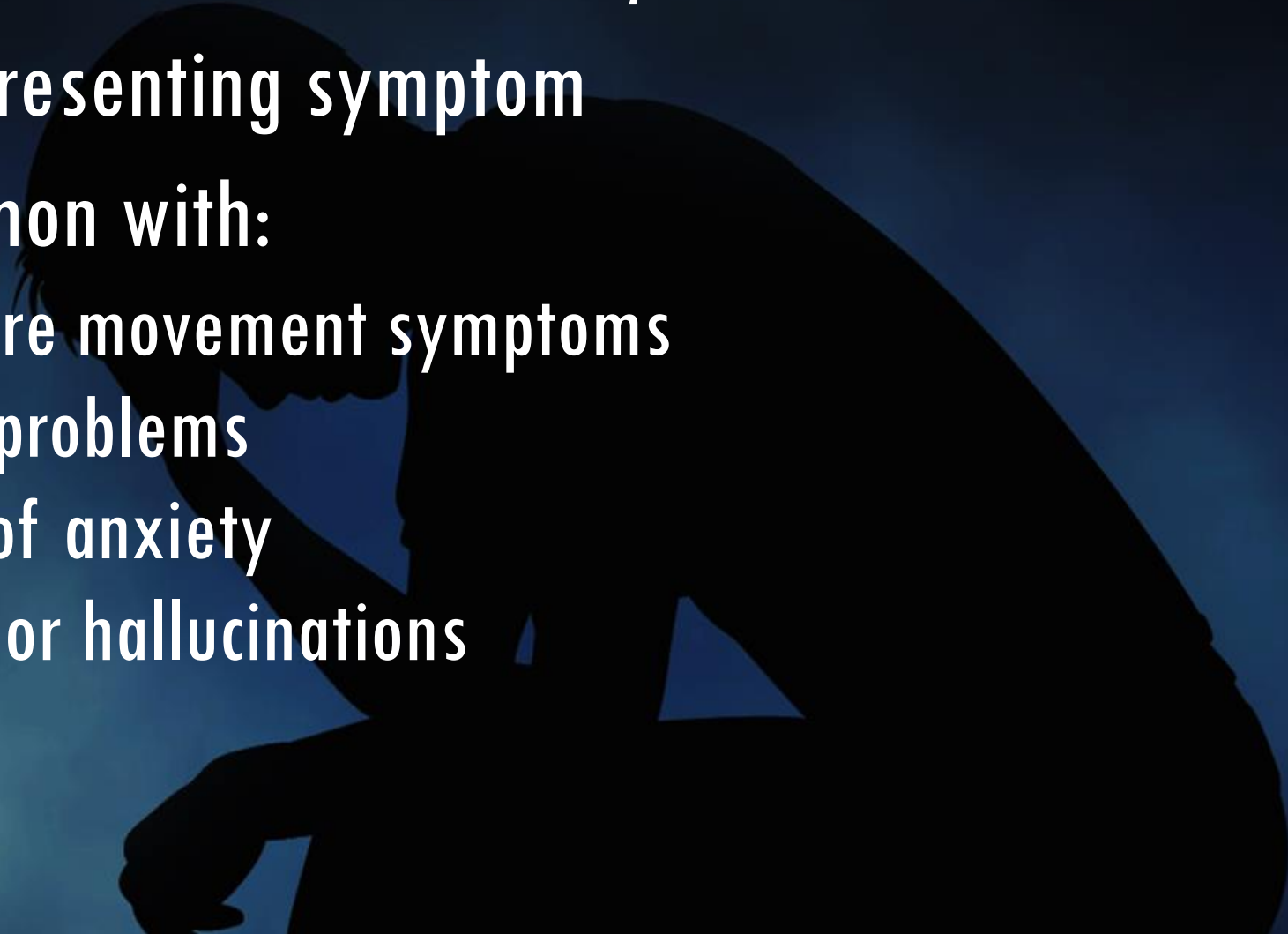
- Change environment and habits
 - Reminders
 - Slow down and reduce multitasking
 - Occupational therapy
- Optimize motor treatment
- Cognitive medication—rivastigmine/Exelon (cholinesterase inhibitor)

HOW WE ACT—MOOD AND BEHAVIOR

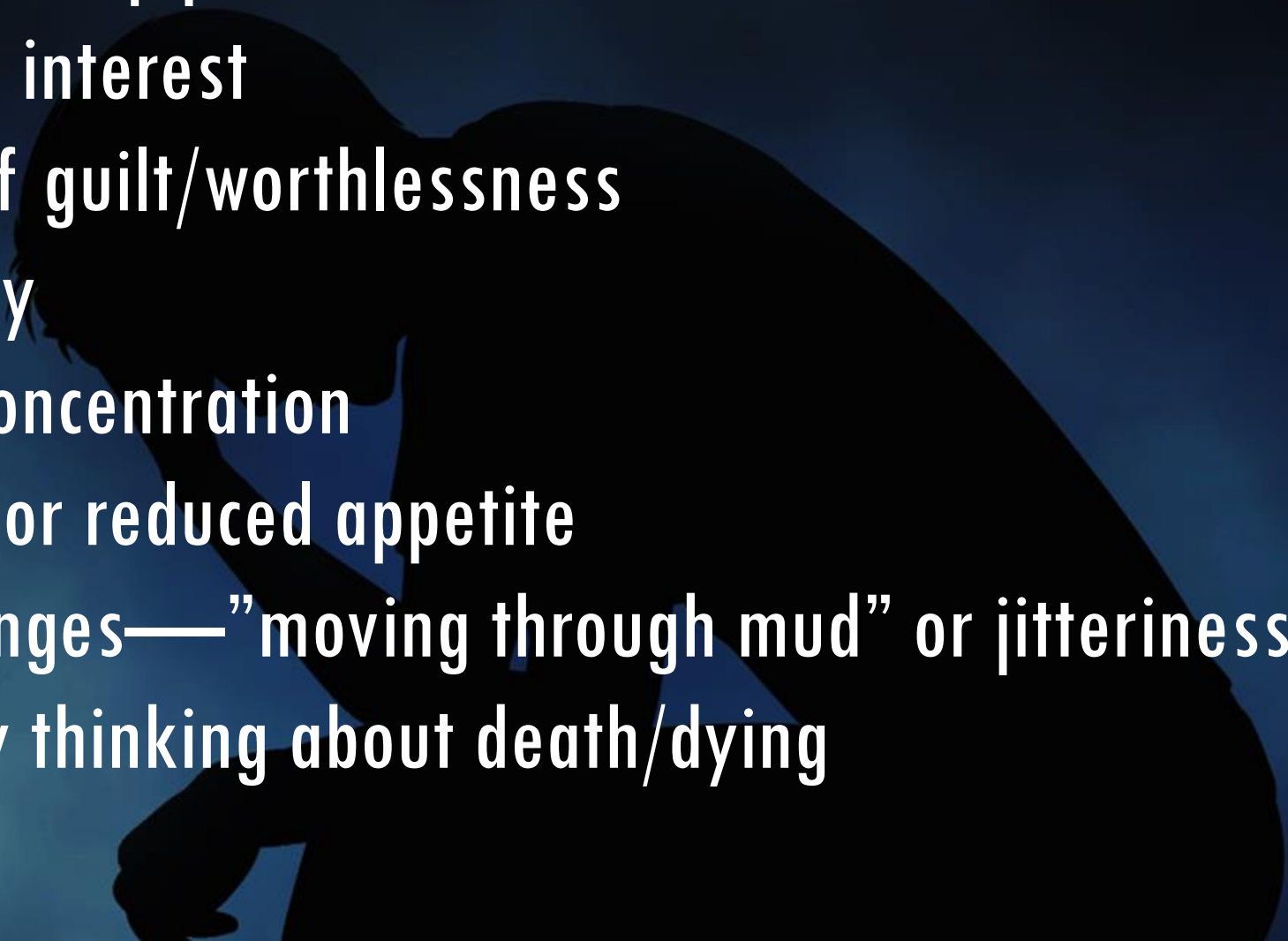
- Directly related to neurotransmitter changes
- Can sometimes be early symptoms
- Common syndromes
 - Mood changes and major depressive disorder
 - Apathy
 - Impulse control disorders

DEPRESSION IN PARKINSON DISEASE

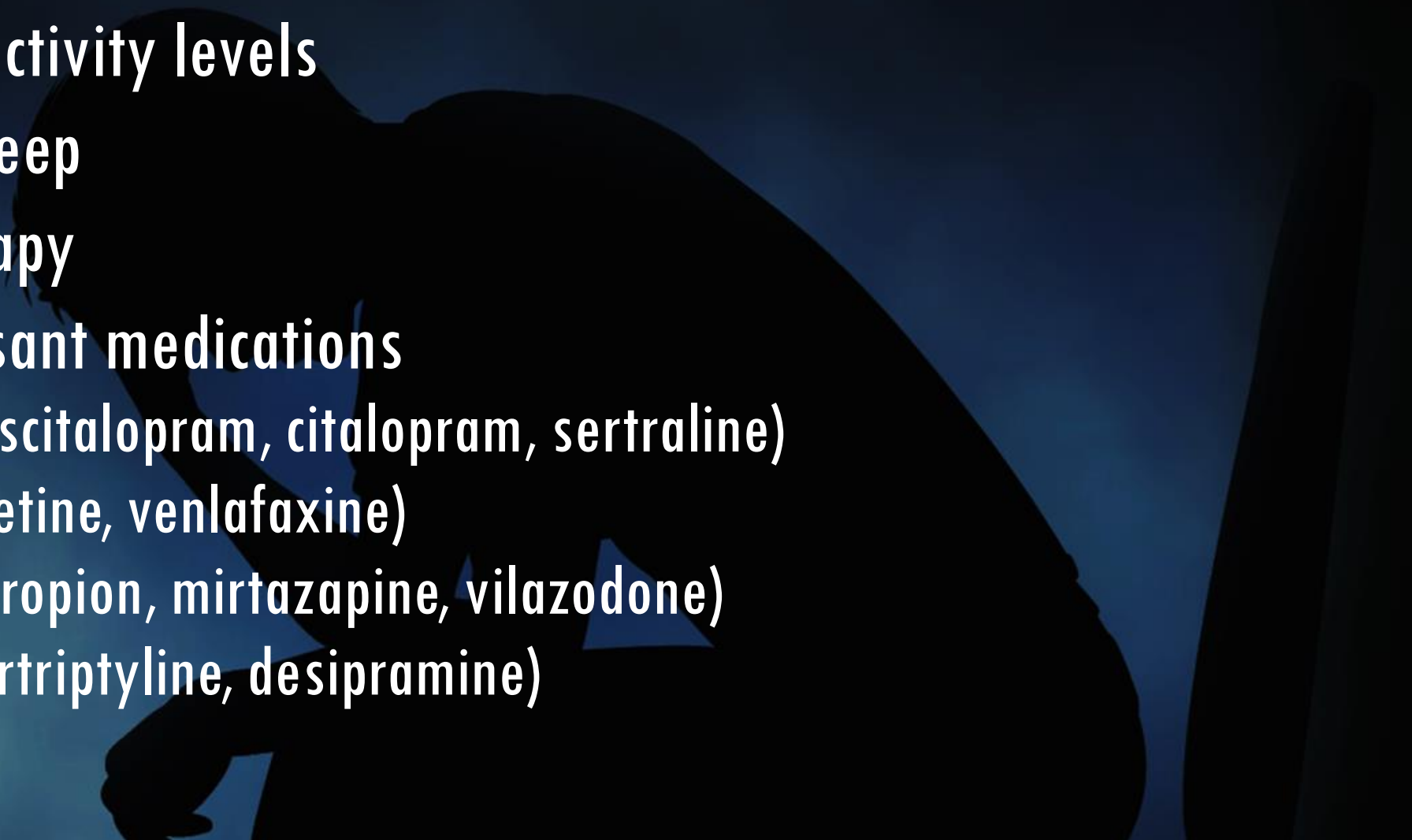
- The most common behavioral syndrome in PD
- Can be a presenting symptom
- More common with:
 - More severe movement symptoms
 - Cognitive problems
 - Presence of anxiety
 - Delusions or hallucinations



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 is shown from the side, slumped forward with their head resting on their hand, conveying a sense of despair or exhaustion. The background is a dark blue gradient.

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)
- 

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

