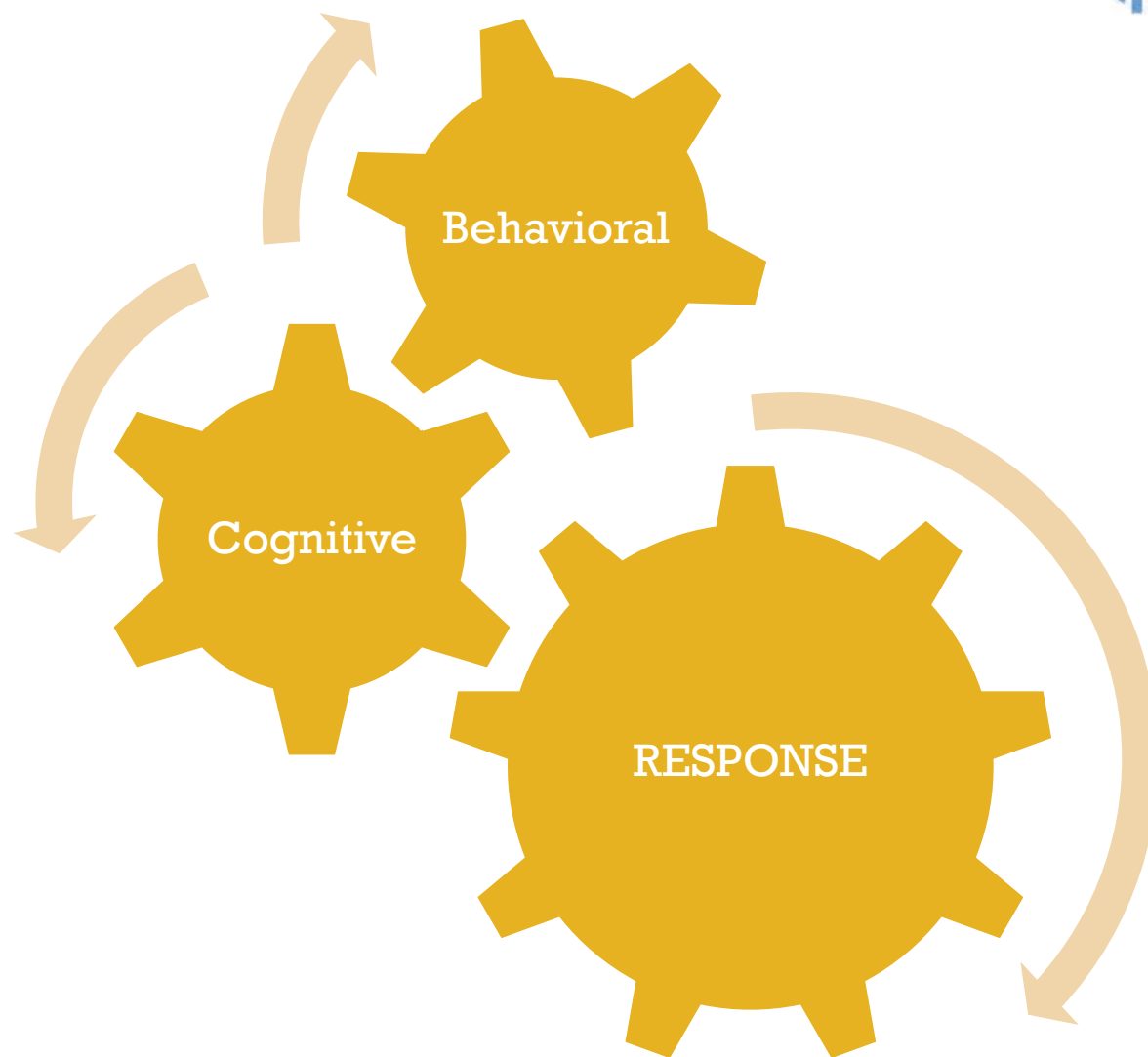


The PD You Don't See: Cognitive & Behavioral Symptoms

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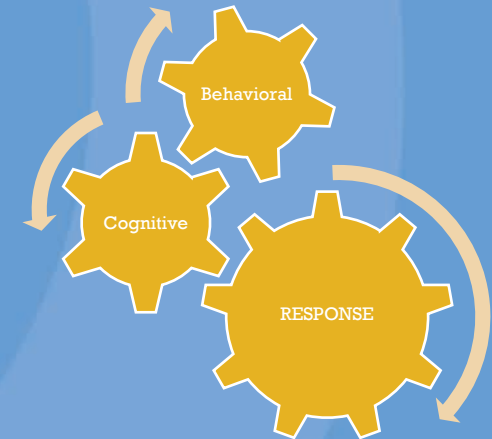


Objectives

- To understand why cognitive and behavioral changes occur in a “motor” disease
- To identify common issues with cognitive and behavioral changes in Parkinson's
- To understand how these changes affect day-to-day functioning
- To learn techniques for managing these challenges

What?

What kinds of thinking and behavioral problems are common in Parkinson's



Non-motor symptoms of Parkinson's

- Cognitive (thinking) problems
- Neuropsychiatric (behavioral) challenges
 - Depression and anxiety
 - Hallucinations and delusions
 - Impulse control issues
 - Apathy
- Sleep disorder
- Pain

Neuropsychiatric (Behavioral) Challenges

Common behavioral challenges

- **Mood changes**
 - Depression (sad mood, loss of pleasure and interest)
 - Anxiety (worry, fear, agitation)
- **Psychosis**
 - Hallucinations (seeing, hearing, or feeling things that others can't)
 - Delusions (strongly believing things that others don't)
- **Impulse control issues** (repetitive behaviors that are problematic)
- **Apathy** (loss of motivation to act)

Mood changes: Depression and Anxiety

- Very common changes (~40%) that occur years before the onset of motor signs
- Symptoms of each often overlap
- Emergence of depression and anxiety are risk factors for developing PD
- Anxiety may impact quality of life to a greater extent than depression

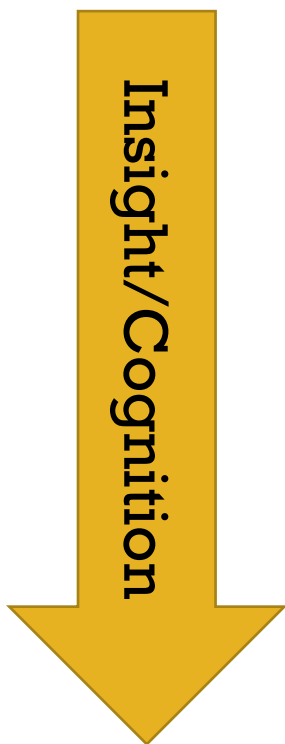
Hallucinations

- ~60% will experience 10 years after onset (Goetz et al. 2006, 2011)
- Commonly animals or objects passing in the periphery or misperception of real objects (illusions)
- Seeing faces or objects in formless visual stimuli like a face in tree bark (pareidolia)
- Experiencing the presence of someone as mist/shadow, maybe not recognizable, or maybe the sense that someone has just left the room

Delusions

- Occur in about 16% of individuals with Parkinson's
- They are a strongly held beliefs not based in reality
- Delusions of all types occur (jealousy, theft, sin, persecution)
- Belief that a loved one has been replaced by an imposter or that your home has been duplicated

Severity and frequency are related to disease progression (ffytche and Aarsland, 2017)



Misperceptions and “passing” illusions

Experiencing the presence of someone

Well-formed hallucinations without insight

Delusions and multimodal hallucinations

Impulse Control Problems

- These are compulsive behaviors that are unwanted, disruptive, or dangerous
 - Pornography
 - Gambling
 - Shopping
 - (Scrapbooking)
- Contact your movement disorder specialist to rule out impact of medication

Apathy

- Reduced or absent drive affecting interests, emotions, and activity
- Characterized by a lack of self-initiated, goal-directed behavior
- Mistaken for indifference or emptiness
- NOT due to sad mood or impairment in memory
- Enjoyment is there once the behavior gets started

Cognitive Challenges

Define these words that doctors use

- The mildest cognitive issues may be noticeable only to you.
- Mild Cognitive Impairment (MCI) is the term used when cognitive problems are observable and measurable but DO NOT interfere with the ability to carry out day-to-day tasks
- Dementia is the term for problems in thinking that are severe enough to interfere with day-to-day functioning
- There are many different causes of dementia and Parkinson's is one

Cognitive problems are common

- ~15% will have cognitive issues before diagnosis
- ~40% will have MCI early in their disease course
- ~10% will develop major cognitive problems three years after diagnosis (Williams-Gray et al., 2007, 2013)
- The likelihood of developing major cognitive problems increases the longer you live with Parkinson's
- Most people will develop major cognitive problems during their journey with Parkinson's (Aarsland & Kurz, 2010)

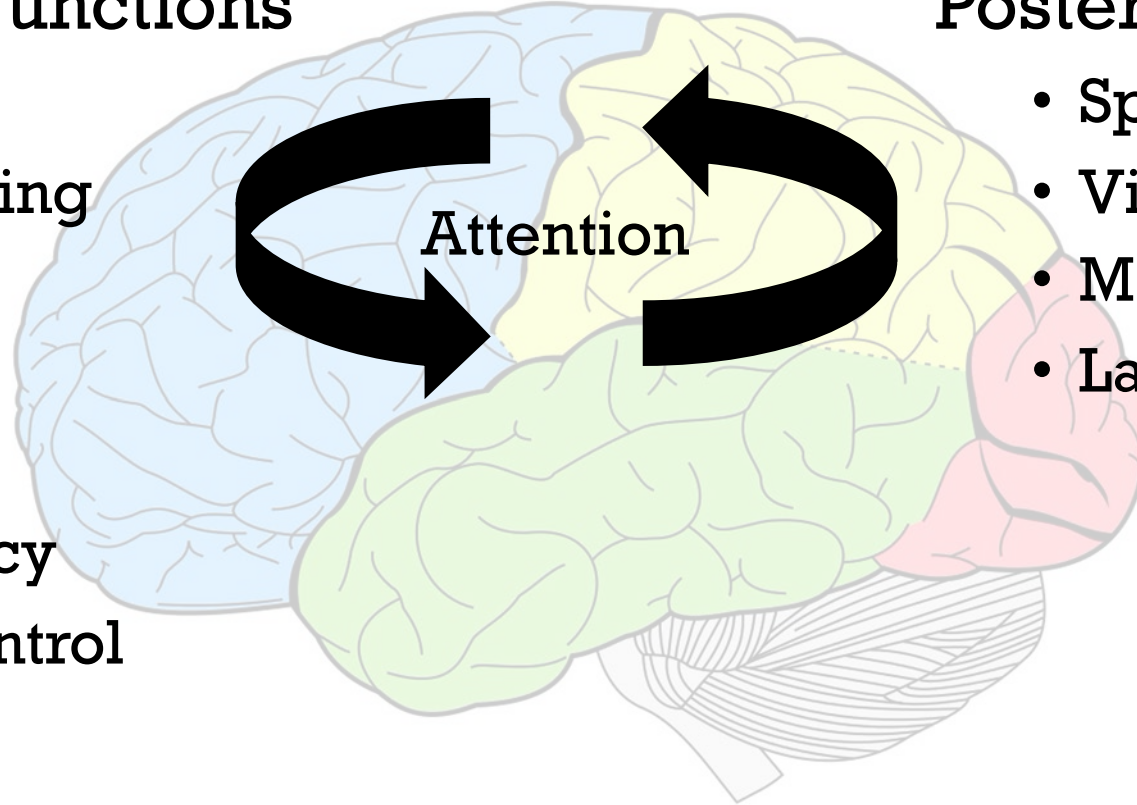
Common cognitive problems in Parkinson's

Anterior Brain Functions

- Planning
- Problem-solving
- Flexibility
- Organization
- Learning
- Speech fluency
- Emotional control

Posterior Brain Functions

- Spatial awareness
- Visual processing
- Memory
- Language comprehension



Anterior cognitive changes

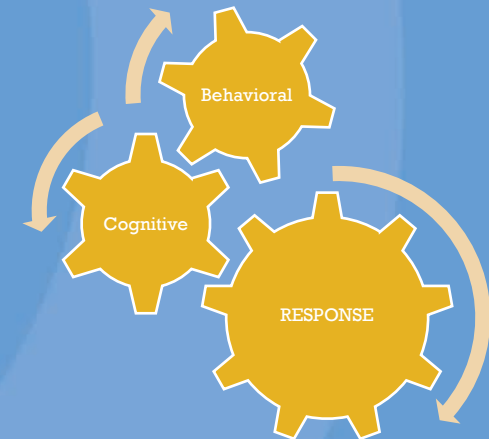
- **Caused by chemical changes in the frontal lobe circuit**
- **Occur early in the course of Parkinson's**
- **Caused by dopaminergic changes in frontal lobe**
- **May not get progressively worse**
- **Are not associated with development of dementia** (Williams-Gray et al., 2009)

Posterior cognitive changes

- Increase risk of falls and driving problems
- Are associated with development of visual hallucinations
- Impact daily functioning and ability to live independently
- Predict development of severe cognitive decline
- Are related to acetylcholine not dopamine

Why?

Why are cognitive and behavioral challenges common in Parkinson's



Cognitive and behavioral changes occur for the SAME reasons as the motor changes

- Parkinson's disrupts the availability of key neurochemicals (dopamine, serotonin, and acetylcholine) that transmit information between brain regions
- Parkinson's causes cell death in regions of the brain necessary for thinking, behavior, and movement notably frontal lobes, basal ganglia, and limbic structures

Why does Parkinson's cause behavioral problems?

- Dysfunction in neurotransmitter systems for serotonin and dopamine are related to neuropsychiatric changes in Parkinson's
- Frontal lobe atrophy (neuron loss) is strongly associated with depression and apathy in Parkinson's
- Loss of dopamine in basal ganglia structures is strongly associated with anxiety
- Hypometabolism in posterior brain regions is strongly associated with development of hallucinations and visuospatial problems

Why does Parkinson's cause cognitive decline?

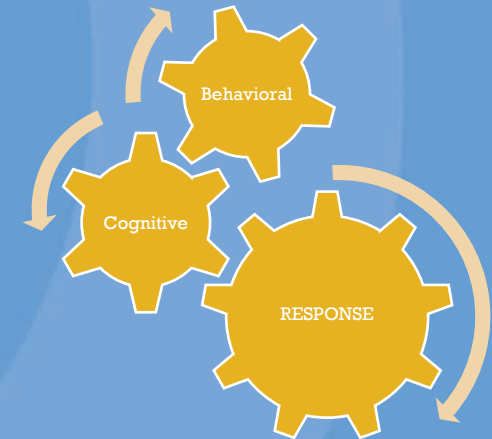
- Genetic factors increase vulnerability in areas of the brain important for thinking
- Age makes people more vulnerable to cognitive decline
- Reduction in important brain chemicals (dopamine, acetylcholine) interferes with thinking

Dopamine medicine affects cognition and behavior

- Improves working memory, planning and sequencing
- May impact attention and learning
- Overstimulates reward system resulting in impulse control problems
- Can overstimulate areas of the brain associated with hallucinations.

How²?

How do these challenges affect life and how are they managed?



Difficulty solving problems and changing strategies

- Take a break, get advice, ask for help

Problems with planning and sequencing steps

- Start early, make a list, finish one step to completion

Disorganization

- Reduce clutter, hire someone to help set up system

Losing train of thought

- Avoid multitasking, keep it simple, limit interruptions

Fluctuations in alertness

- ID best times, nap, discuss med list with physician

Frustration with care partner

- State, rephrase, repeat, write it down

Forgetfulness for instructions, lists, appointments

- Rely on to-do lists, calendars, “Smartphone” reminders

Bumping into furniture, tripping on stairs, failing to navigate distances

- Mark stairs, use assistive devices, rehab balance (YOGA)

Worsening cognitive problems impacting independence

- Delegate tasks so you can FOCUS on meaningful experiences

Depression and anxiety

- Engage your community, use behavioral techniques, consult your physician and consider adding a geriatric psychiatrist to team

Visual hallucinations and misidentifications

- Reduce shadows, reduce mirrors, stare at the object, consult your physician and consider adding a geriatric psychiatrist to team

Impulse control problems

- Tell your loved ones, consult your physician and discuss your medication list for possible culprits

Apathy

- Recognize that external support is needed, schedule activities so that they become routine, use alarms and care partners to initiate action

Exercise is medicine

- **Four-weeks of treadmill training improved executive functions as well as gait and mood** (Picelli, 2016).
- **Aerobic and anabolic exercise improved executive functions** (Reynolds et al., 2016, Uc et al., 2014).
- **Consider exercises that link mental and physical attention**
 - Noncontact boxing
 - Yoga
 - Tai Chi

Managing Cognitive Problems Daily

Limit distractions

Maintain a consistent schedule

Simplify tasks into single steps

Remind others to slow down

ID “best times” of the day

Reduce stress

Managing Mood Issues Daily



Label your feelings—unsettled in the grocery store, panicky outside the home, scared of the unknown, worried about finances



Turn off the news—Constant, stream of talking heads increases anxiety. Turn on music instead



Get on a schedule—wake on time, shower and dress, plan exercise, knock off a long-planned project, go to sleep on time



Connect with loved ones—Be creative, send a daily card, send a photo album, plan a trip, reassure and reconnect daily

Managing Mood Issues Daily



Find alone time—long shower or bath, garden, vacuum, walk, paint, crochet, use headphones



Mindfulness—download apps (Calm, Headspace, InsightTimer, UCLA Mindful)



Exercise is medicine—walk, Nike Fit Club, DPF, local resources (211.org)



Be physically distanced NOT emotionally distanced—reach out to others using Zoom, FaceTime, Facebook, or the old-fashioned way

Managing Mood Issues Daily



Telemedicine is NOW available for everyone. Go to psychologytoday.com for a listing of professionals who specialize in your challenges



Help others— Volunteer, support a local business with a gift to someone less fortunate, reach out to a neighbor



Use behavioral activation techniques—List 3 “have-tos” and 3 “love-tos” and reward yourself with enjoyable activities when you complete less enjoyable ones



Find humor—Watch comedies, be silly, laugh out loud with children, read your grandchildren bedtime stories

Action Steps

1. Recognize non-motor signs and speak to your movement disorders specialist about them
2. Incorporate more structure into your life; consider behavioral activation techniques
3. Recognize the importance of stress reduction practices and exercise
4. Regularly review medication lists with your pharmacist to identify potentially dangerous interactions