

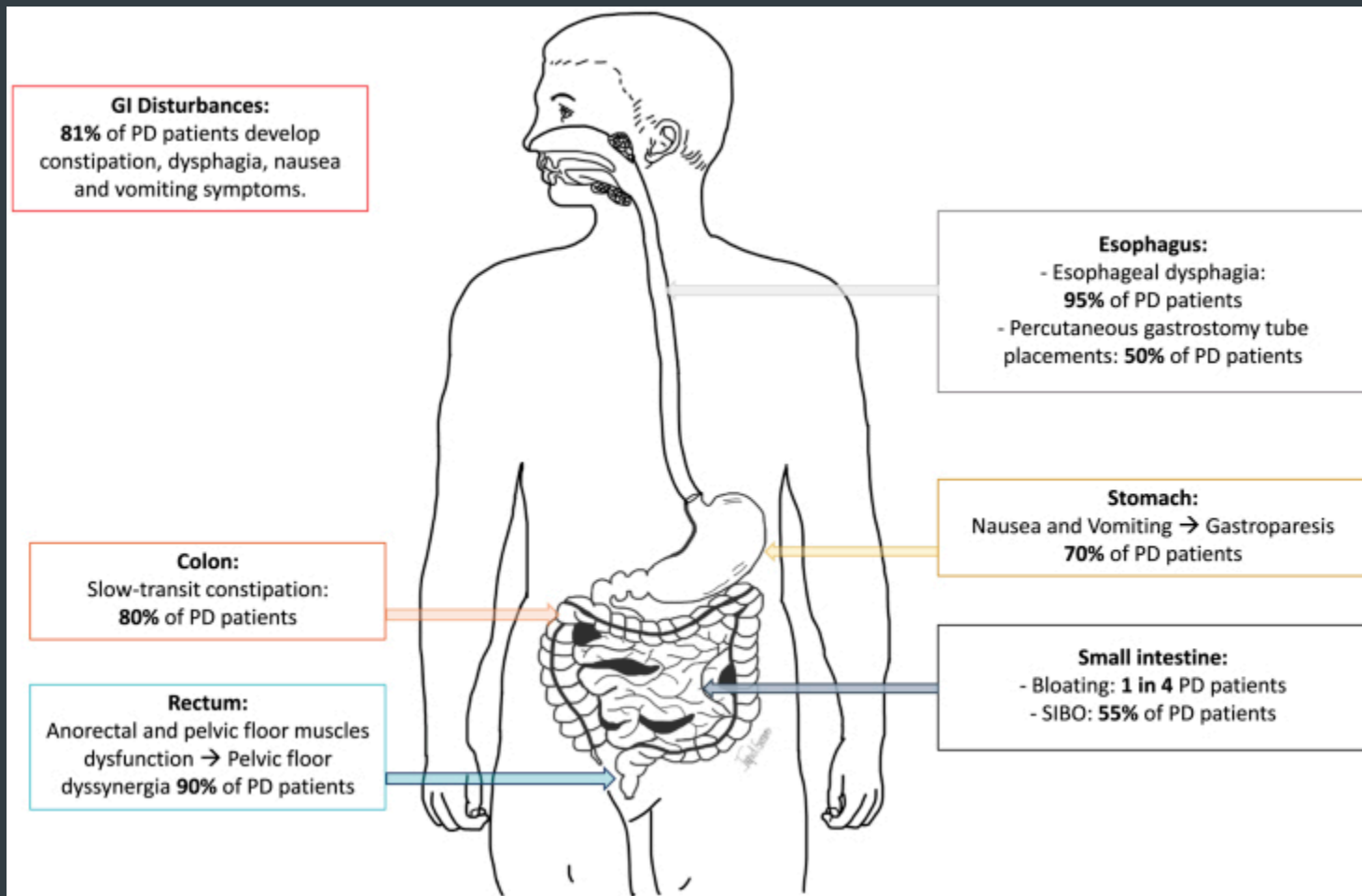
# Balancing Nutrition & GI Issues in Parkinson's Disease

Jenna Wuebker, MS, RD, LMNT, LD  
Nutrition Therapist  
Nebraska Medicine Neurological Sciences

# Gastrointestinal Issues

- As many as 81% of patients with PD develop GI problems
- Affects quality of life
- Correlated with worse anxiety and depression





Pasricha TS, Guerrero-Lopez IL, Kuo B. Management of Gastrointestinal Symptoms in Parkinson's Disease: A Comprehensive Review of Clinical Presentation, Workup, and Treatment. *J Clin Gastroenterol.* 2024;58(3):211-220. Published 2024 Mar 1. doi:10.1097/MCG.0000000000001961



# Nutritional Concerns with Gastrointestinal Issues

- Eating less
- Drinking less
- Unintentional weight loss
- Malnutrition
- Weakness
- Fatigue



# Nutrition Goals

- Maximize nutritional intake safely to avoid nutritional issues
  - Simultaneously while working with your doctor on the cause and treatment
- Avoid weight loss



# Gastrointestinal Issues

1. Nausea
2. Gastroparesis
3. Constipation
4. Dysphagia



# Nausea

# Nausea

- Queasy or uneasy feeling in stomach
- May lead to vomiting in severe cases
- Can be a side effect from medications such as carbidopa-levodopa
- Can occur as a secondary effect of gastroparesis or constipation





# Nutrition Strategies - Nausea

- Have food with medications if safe to do so
  - Carbidopa-levodopa: Okay to take with carbohydrates such as fruit, crackers, pretzels, toast, dry cereal
- Eat light, bland foods
  - Crackers
  - Toast
  - Pretzels
  - Rice
  - Potatoes
  - Pasta



# Nutrition Strategies - Nausea

- Try cold foods
  - Gelatin
  - Pudding
  - Applesauce
  - Ice cream
  - Chilled fruit
  - Yogurt
  - Custard
  - Popsicles
- Avoid strong flavors, greasy foods and fried foods
  - Spicy foods
  - Fast food
  - Deep fat fried foods



# Nutrition Strategies - Nausea

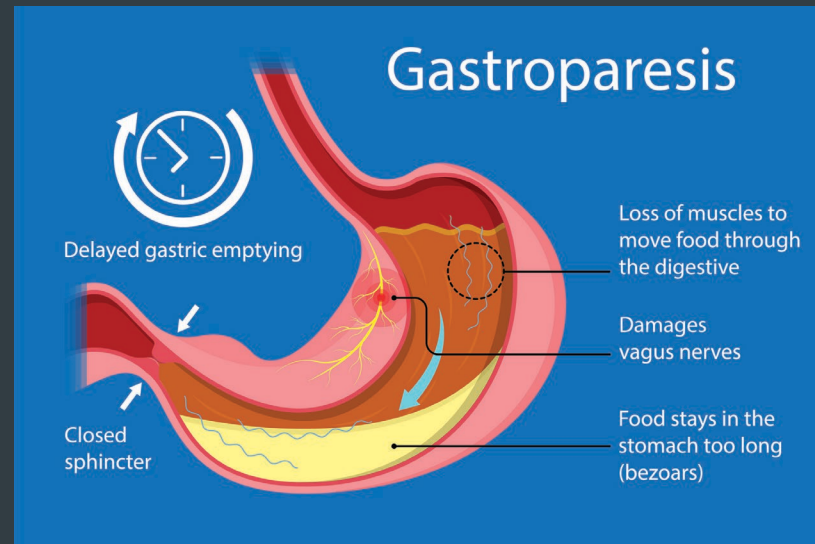
- Eat and drink slowly.  
Have something to eat every 1-2 hours.
- Try ginger or peppermint tea



# Gastroparesis

# Gastroparesis

- Delayed stomach emptying
- Food sits in stomach longer than normal
- Can be diagnosed with gastric emptying study
  - Many patients with PD do not have symptoms



# Gastroparesis

- Only FDA-approved medication for gastroparesis, metoclopramide (Reglan) should be avoided
  - Blocks dopamine receptors in brain
  - PD symptoms may worsen
- Other treatments can be considered



# Nutrition Strategies - Gastroparesis

- Have smaller, more frequent meals and snacks
  - Breakfast
  - Morning snack
  - Lunch
  - Afternoon snack
  - Dinner
  - Evening snack
- Avoid foods that increase acid reflux
  - Acidic foods
  - Spicy foods
  - Fried foods
  - Greasy foods
  - Caffeine
  - Mint



# Nutrition Strategies - Gastroparesis

- Choose low fat solid foods
  - Chicken
  - Turkey
  - Fish
  - Lean beef
  - Egg whites
  - Low fat ice cream
  - Low fat yogurt
  - Low fat cottage cheese
  - Choose oils over butter
  - Broth
  - Gelatin
  - Popsicles
- Choose low fiber foods
- Aim for 2 grams of fiber or less per serving
  - Saltine crackers
  - Graham crackers
  - Puffed rice cereal
  - Cream of rice
  - Cream of wheat
  - Grits
  - Pretzels
  - White bread
  - White rice
  - Canned vegetables without seeds, skins, hulls
  - Cooked carrots
  - Mashed potatoes
  - Sweet potato
  - Canned fruit without seeds, skins, membranes
  - Applesauce
  - Banana





# Nutrition Strategies - Gastroparesis

- High fat liquids may be tolerated
  - Milkshakes
  - Smoothies made with cream
- Avoid carbonated beverages which can lead to bloating
  - Soda
  - Carbonated water



# Nutrition Strategies - Gastroparesis

- Chew foods well before swallowing. Consider ground or pureed foods.
- Utilize oral nutrition supplements

Product	Calories
Boost Very High Calorie	530
Boost Plus	360
Ensure Plus	350
Ensure Complete	350
Naked Juice Protein	~400
Bolthouse Farms Protein Plus	~400
Orgain Organic Nutrition Shake	250
Carnation Breakfast Essentials	240



# Constipation

# Constipation

- Often appears before motor symptoms up to 20 years before diagnosis
- Slow transit constipation or pelvic floor dysfunction

## Causes

- Changes in nerve cells of intestines
- Slowing of intestinal muscles
- Medication side effects
- Decrease in physical activity
- Inadequate fluid intake
- Changes in dietary intake



# Definition of Constipation

- Fewer than 3 stools a week
- Hard, difficult to pass stools

## Symptoms:

- Hard, dry or lumpy stools
- Straining or pain when passing stools
- A feeling that not all stool has passed
- A feeling that the rectum is blocked
- The need to use a finger to pass stool



# Nutrition Strategies - Constipation

## Slow transit constipation

- Increase fiber
- Increase water
- Increase physical activity
- Probiotics

## Pelvic floor dysfunction

- Do pelvic floor physical therapy



# Nutrition Strategies - Constipation

## Fiber

- Fruits: passion fruit, guava, raspberries, blackberries, pear, avocado, kiwi, blueberries
- Vegetables: peas, artichoke, Brussels sprouts, kale, sweet potato, beets, broccoli, carrots
- Whole Grains: bulgur, quinoa, whole wheat pasta, oatmeal, brown rice, whole wheat bread, bran
- Nuts, Seeds & Legumes: chia seeds, lentils, black beans, pumpkin seeds, almonds, pistachios, pecans, ground flax seed
- Prunes and prune juice



# Nutrition Strategies - Constipation

## Tips for Adding Fiber

- Increase fiber SLOWLY
- Add 1 new fiber rich food at a time
- If difficulties increasing fiber through food, can try fiber supplement (Ex: Metamucil, Benefiber, Citrucel)





# Nutrition Strategies - Constipation

## Fluids

- Include water, 100% fruit juice, vegetable juice, milk, sports drinks, lemonade
- Foods with a higher water content: soup, broth, gelatin, pudding, yogurt, applesauce, watermelon, popsicles, smoothies
- Smooth Move tea
  
- How much do you need?
  - 25-35 mL/kg
  - Take weight in lbs and divide by 2 = ounces to drink
    - Ex: 150 lbs (56-80 oz)
    - Ex: 200 lbs (75-106 oz)



# Nutrition Strategies - Constipation

## Tips for Drinking More Fluids

- Be intentional
- Determine fluid goal
- Fill jug of water with goal amount
- Use water bottle
- Drink a glass of water each time you take medications
- Drink a glass of water with each meal
- Try flavored liquids

You will go to the bathroom  
more! 😊



# Nutrition Strategies - Constipation

## Physical Activity

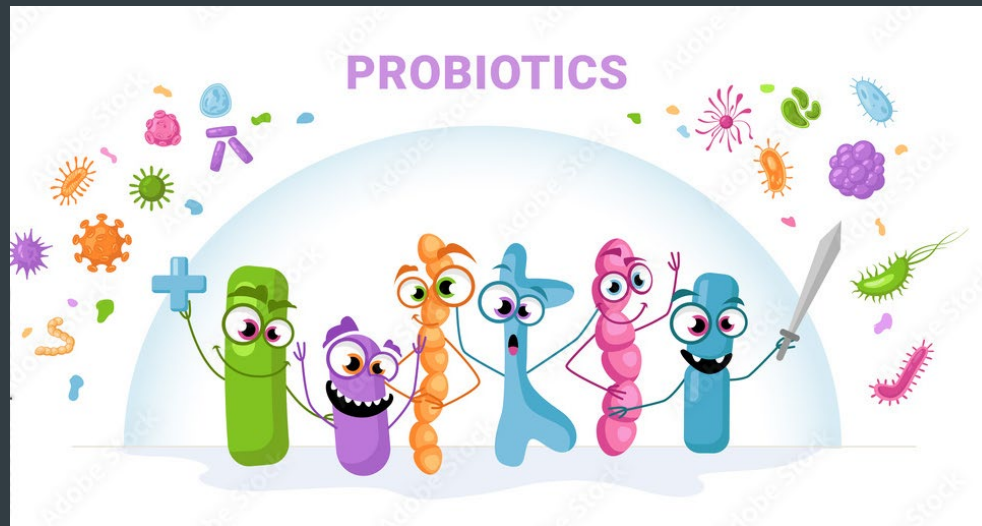
- Decreases time it takes food to move through intestines
- Stimulates natural squeezing of muscles in intestines
- Walking, running, swimming, dancing, yoga, PD exercise classes



# Nutrition Strategies - Constipation

## Probiotics

- Live bacteria that can enhance gut microbiome
- Meta-analysis showed improved stool frequency and decreased number of laxatives needed



# Nutrition Strategies - Constipation

## Probiotics

### – Examples:

- The ***Lactobacillus*** genus, including *L. acidophilus*, *L. rhamnosus*, *L. casei* and *L. plantarum*
- The ***Bifidobacterium*** genus, including *Bifidobacterium longum* and *Bifidobacterium breve*

### – Sources:

- Yogurt
- Kefir
- Sauerkraut
- Kombucha



# Nutrition Strategies - Constipation

## **Chia seed pudding**

**Servings:** 4

**Ingredients:** 1/3 cup chia seeds  
1 1/2 cups milk  
2 Tablespoons maple syrup or honey  
1/2 teaspoon vanilla

**Optional ingredients/toppings:** Fruit, chopped nuts, coconut flakes

**Instructions:** Combine all ingredients in container with lid. Put lid on and shake ingredients. Chill for about an hour, then return to the container and shake it up. Let chill for at least 4 hours and overnight is even better. Chia seeds will expand and turn into the consistency of pudding/applesauce. Add optional ingredients/toppings before serving.



# Nutrition Strategies - Constipation

## Oats, Prune Juice, and Applesauce Constipation Remedy

**Ingredients:** 2/3 cup old fashioned oats

1/2 cup prune juice

1/2 cup applesauce

**Instructions:** Mix together all ingredients and store in the refrigerator. Have 2-4 Tablespoons a day or more as needed.



# Nutrition Strategies - Constipation

- If more help is needed...
  - Contact your doctor for recommendations on medications for constipation.
  - Stool softeners, laxatives, suppositories, enemas, etc.





# Dysphagia

# Dysphagia

- Involves any difficulty chewing or swallowing
- Can include issues with mouth, throat and esophageal muscles
  
- Important to see a Speech-Language Pathologist for a swallow assessment



# Nutrition Strategies - Dysphagia

- Follow diet texture and liquid consistency recommendations
  - Regular
  - Soft & bite sized
  - Minced & moist
  - Pureed
  - Thickener added to liquids
- Naturally pureed items
  - Applesauce
  - Pudding
  - Smooth yogurt
  - Ricotta cheese
  - Tomato soup
  - Refried beans
  - Mashed potatoes
  - Mashed sweet potatoes
  - Oatmeal
  - Cream of wheat
  - Cream of rice



# Nutrition Strategies - Dysphagia

- Have smaller, more frequent meals and snacks
  - Breakfast
  - Morning snack
  - Lunch
  - Afternoon snack
  - Dinner
  - Evening snack
- Drink liquids with calories and/or protein
  - Whole chocolate/strawberry milk
  - Hot cocoa made with whole milk
  - Milkshake
  - Malt
  - Kefir
  - Yogurt drinks
  - Fruit smoothie
  - Naked Juice
  - Fruit juice
  - Lemonade
  - Sports drinks



# Nutrition Strategies - Dysphagia

- Drink oral nutrition supplements

Product	Calories
Boost Very High Calorie	530
Boost Plus	360
Ensure Plus	350
Ensure Complete	350
Naked Juice Protein	~400
Bolthouse Farms Protein Plus	~400
Orgain Organic Nutrition Shake	250
Carnation Breakfast Essentials	240



# Nutrition Strategies - Dysphagia

- Mix in high calorie items
  - Oils
  - Butter
  - Mayonnaise
  - Ranch dressing
  - Gravy
  - Peanut butter
  - Cheese
  - Cream cheese
  - Sour cream
  - Heavy whipping cream
  - Coconut cream
  - Avocados
  - Pesto
  - Alfredo sauce



# Nutrition Strategies - Dysphagia

- May benefit from using a feeding tube if there are more significant swallowing issues
  - Used for nutrition, hydration and/or medications
  - Goes into the stomach
  - If safe to still eat or drink, can choose to have things you enjoy.
  - Can help meet increased calorie and protein needs.
  - Reduce episodes of aspiration pneumonia



# Other Steps

- Determine the cause if possible
- Talk to your neurologist
- See a gastroenterologist
- Meet with a registered dietitian





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# The Role of Physical and Occupational Therapy in Parkinson's Disease

Anne Mahnke, OTR/L  
Jennifer McKune, MPT

# What can Physical Therapy do?

- Physical therapy provides services to individuals and populations to develop, maintain and restore maximum movement and functional ability throughout the lifespan.
- This includes providing services in circumstances where movement and function are threatened by ageing, injury, pain, diseases, disorders, conditions or environmental factors.
- Functional movement is central to what it means to be healthy. (World Confederation for Physical Therapy, 2015)



# Goals of Physical Therapy:

- Promote quality of life and independence by encouraging activity and maximizing functional mobility
- Promote safety and fall prevention
- Improve movement for daily activities by recalibrating the body through large amplitude exercises
- Improve walking by incorporating large movement patterns and using internal and external cues



# What can Occupational therapy do?

- Dressing: pulling on/off clothes, buttoning, zippers, reaching feet/shoes
- Fine motor: cutting food and eating, hand-writing, opening containers, typing
- Mobility for Self Cares: getting in/out of bed, on/off of toilet, movements for bathing, cooking, and laundry
- Driving: addressing coordination, reaction time, and visual skills needed for safe driving



# Goals of Occupational Therapy:

- Increase independence with daily self cares through use of restorative or compensatory strategies
- Educate on how to implement aerobic training to achieve optimal benefit for management of Parkinson's symptoms
- Educate on high amplitude movements to increase ability to complete daily tasks.
- Improve coordination and strength for dressing, bathing, cooking, leisure activities, and work-related tasks
- Caregiver education



# Importance of Exercise to Manage Parkinson's Symptoms

"High-intensity exercise induces brain-protective effects that have the potential to not just slow down, but possibly reverse, the neurodegeneration associated with Parkinson's disease, a new pilot study suggests."

(Yale School of Medicine, 2023)

"The medications we have available are only for symptomatic treatment. They do not change the disease course. But exercise seems to go one step beyond and protect the brain at the neuronal level."

(Sule Tinaz, MD, PhD via Yale School of Medicine, 2023)





# Importance of Exercise with PD

- **Help Brain Cells Use Dopamine More Efficiently**
  - Exercise improves efficiency by modifying areas of the brain where dopamine signals are received (Substantia Nigra and Basal Ganglia)
- Exercise helps maintain old connections, form new ones, and restore lost ones
- Neuroplasticity = change in neural pathways and synapses due to changes in behavior, environment, neural processes, thinking, emotions (external and internal cues) (Fisher et al. 2004)
- Neuroplasticity from exercise outweighs the effects of neurodegeneration



# Working with Therapy

Working with a therapist can help increase confidence with exercise by developing a tailored exercise program, addressing any questions or concerns the patient or family may have, and promoting better compliance with the home exercise program.



# PT and OT Assessments:

## Standardized Testing:

- Strength and ROM
- Balance
- Gait
- Coordination (gross and fine motor)
- Functional performance
- Vision
- Cognition

Assessment and interventions are tailored to meet the needs of the individual. Goals are established to be meaningful and functional for each person.



# Early-stage Interventions

- Individualized exercise program
- LSVT-BIG and PWR! Moves – learned at diagnosis
- High Intensity Exercise
- Ask for referral upon diagnosis



# Early-stage Interventions:

- **Resistance Training.** Studies suggest muscular strength and functional gain are greater when high-intensity protocols are used involving primarily eccentric contraction (Dibble et al. 2006, Dibble et al. 2009)
  - Postural muscles
  - Trunk extensors
  - Hip extensors and hip abductors
  - Quadriceps and hamstrings
- **Aerobic Exercise**
  - Improves the effectiveness of levodopa, thus improving motor response
  - Produces a neuroprotective effect and helps to restore neuronal pathways impaired by PD (Fisher et al. 2004, Pothakos et al. 2009)



# Early-stage Interventions:

- **Balance Training**
  - Focus on postural control through exercises that incorporate somatosensory and musculoskeletal systems
- **Gait training.** External cue training (auditory, visual, and tactile) can improve walking speed, step length and freezing severity (Nieuwboer et al. 2007)
  - Treadmill training promotes a steady rate with regular and uniform speed through the generation of rhythmic gait cycles. This is viewed as an external cue to trigger the motor activity being performed (Nieuwboer et al. 2007)



# Early-stage Interventions:

- **Consistent.** Duration longer than 6 months showed gains on functional balance and mobility as compared to program of 2-10 weeks (National Parkinson Foundation)
- **Practice Movement Strategies**
  - Home exercise program
  - Attend classes in the community
  - Focus on reciprocal movement exercises
  - Use rhythmic and symmetric movements



# PD specific exercise programs

- LSVT BIG
- Parkinson's Wellness Recovery (PWR! Moves)

Using **large amplitude** movements at **high intensity** to increase dopamine output and counteract Parkinson's symptoms





# High Intensity Exercise

RPE SCALE	RATE OF PERCEIVED EXERTION
<b>10</b> /	<b>MAX EFFORT ACTIVITY</b> Feels almost impossible to keep going. Completely out of breath, unable to talk. Cannot maintain for more than a very short time
<b>9</b> /	<b>VERY HARD ACTIVITY</b> Very difficult to maintain exercise intensity. Can barely breathe and speak only a few words
<b>7-8</b> /	<b>VIGOROUS ACTIVITY</b> Borderline uncomfortable. Short of breath, can speak a sentence
<b>4-6</b> /	<b>MODERATE ACTIVITY</b> Breathing heavily, can hold a short conversation. Still somewhat comfortable, but becoming noticeably more challenging
<b>2-3</b> /	<b>LIGHT ACTIVITY</b> Feels like you can maintain for hours. Easy to breathe and carry a conversation
<b>1</b> /	<b>VERY LIGHT ACTIVITY</b> Hardly any exertion, but more than sleeping, watching TV, etc



# High Intensity Exercise

## Heartrate:

Vigorous Physical Activity defined as 70-85% of HR max

Max Heartrate =  $220 - \text{age}$

Calculate the 70-85% range for each patient

## Sustained activity vs. High intensity interval training



# Middle-stage Therapy Interventions

LSVT-BIG and PWR! Moves (can be modified to meet individual abilities)

ADL specific interventions

Adaptive equipment

- Consider use of a cane, rollator walker, U-Step walker



# Middle-Stage Therapy Interventions

## Cueing for Parkinson's Disease:

- The goal of therapy is often to help patients develop intrinsic cues needed to succeed in any environment. However, in mid and late stages of PD, extrinsic cues may be needed for safety and success.
- **Extrinsic Cueing**
  - Visual cues
  - Auditory cues
- **Intrinsic Cueing**
  - Positive attitude and mindset—the “I can.” and “I will.”
  - Mental rehearsal of difficult or new tasks
  - Internal dialogue—end goal of LSVT BIG to “Think BIG”
  - Visualization of tasks such as turning without freezing

(Ebersbach et al. 2010 2014, Farley & Koshland 2005, Tamir et al. 2007)



# Middle-Stage Therapy Interventions

- **PD Specific Exercise Education:**
  - Modifications to HEP
  - Proprioceptive work
- **Gait and Balance Training:**
  - Fall prevention and recovery
  - Home safety assessment
  - Assistive devices
  - Vision
  - Blood pressure fluctuations
- **Strength Training:**
  - Proximal strength during ADLs/Work
  - Cognitive dual task
- **Cardiovascular:**
  - Endurance training
  - Pacing
- **Fine motor training:**
  - Training for different types of grasp
- **ADL Training:**
  - Driving
  - Home modifications
  - Sleep hygiene
  - Adaptive device trials
- **Work Task Training:**
  - Workstation ergonomics
  - Adaptive devices



# Late-Stage Therapy Interventions

- Maximize Comfort, Dignity, and quality of life
- Exercises with modifications
  - Increased stretching
  - Chair exercises
  - Care giver assistance
- Re-addressing **safe** living situations
  - Level of supervision
  - Home setup
  - Hired caregivers
  - Placement
- AE/DME evaluation
  - Wheelchair (manual, power, seating systems, etc.)
  - Home AE/DME (reacher, tub transfer bench, commode, lift, etc.)
  - Home modifications (grab bars, doorways, visual cues, etc.)



# Late-Stage Therapy Interventions

- Awareness of posture and positioning
  - Appropriate cushions/seating systems
  - Frequent position changes
    - Weight shifts/Stretching
    - Transfers
    - Wheelchair options
- Safe transfers and bed mobility
  - Safety for the patient and care giver!
  - Body mechanics
  - Equipment recommendations as needed
- Caregiver support
  - Prevention of injury
  - Prevention of burnout
  - Support groups



# When to get a referral to PT/OT:

- A new diagnosis of Parkinson's to learn appropriate exercises in order to maintain function and mobility
- Decreased mobility
- Increased difficulty with daily activities





# Contact Information

Anne Mahnke, MOT, OTR/L  
Occupational Therapist  
Nebraska Medicine Village Pointe  
402-552-3200  
[amahnke@nebraskamed.com](mailto:amahnke@nebraskamed.com)

Jennifer McKune, MPT  
Physical Therapist  
Nebraska Medicine Clarkson Doctors Building South  
402-552-3200  
[jmckune@nebraskamed.com](mailto:jmckune@nebraskamed.com)



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