



**APTA**  
**Kentucky**<sup>SM</sup>

A Chapter of the American  
Physical Therapy Association

[aptaky.org](https://aptaky.org)

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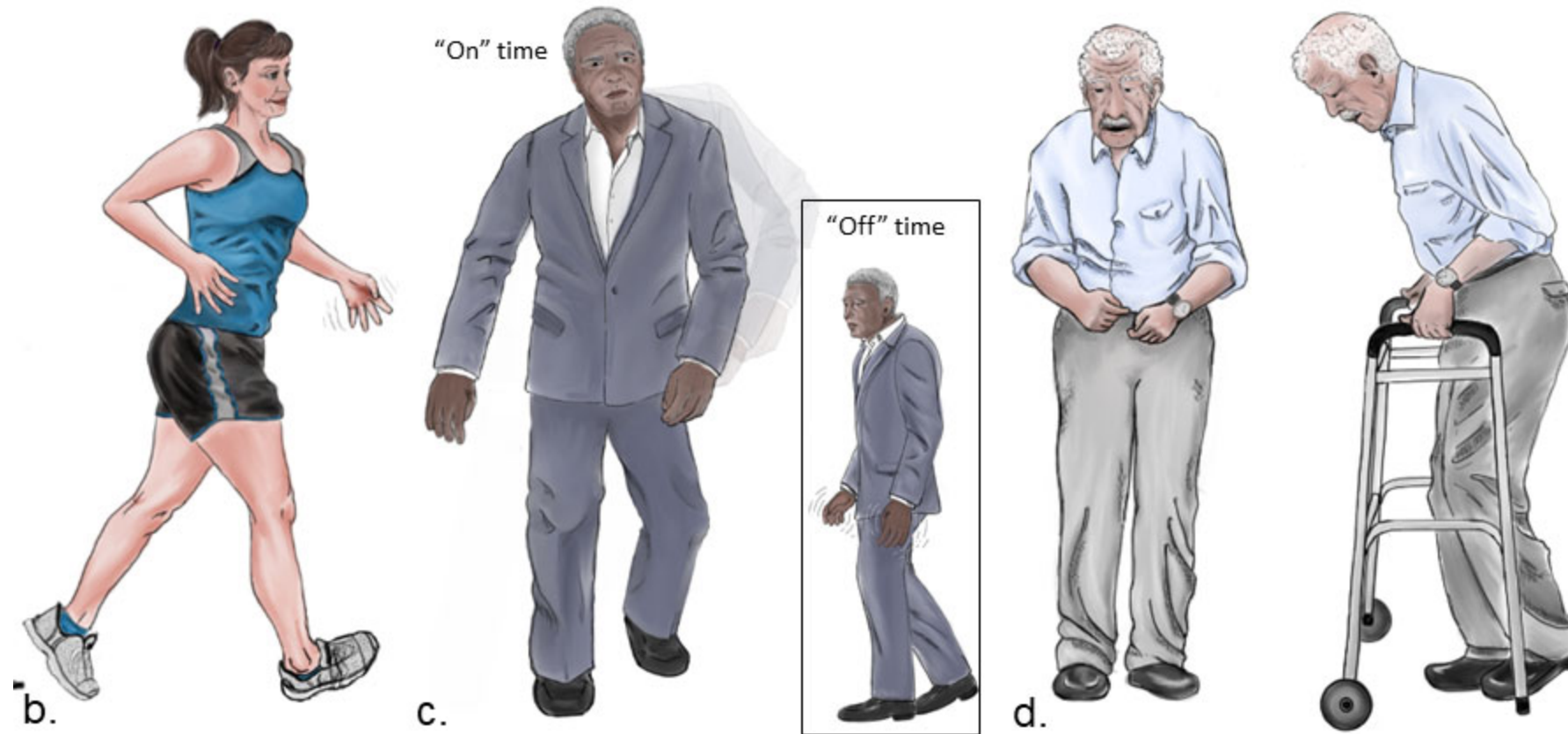
**2021 ANNUAL CONFERENCE**

# In this session...

- **Define Clinical Practice Guidelines (CPGs) and how to utilize in clinical practice to inform and guide treatment.**
- **Discuss the European Physiotherapy Guideline for Parkinson's Disease**
- **Highlight current Evidence Based Interventions for People with Parkinson's Disease (PwP)**

# Parkinson's Disease

- Nearly one million people in the U.S. affected by PD; expected to rise to 1.2 million by 2030.
- More than 10 million people worldwide are living with PD.
- Approximately 60,000 Americans are diagnosed with PD each year.
- Incidence of Parkinson's disease increases with age, but an estimated four percent of people with PD are diagnosed before age 50.
- Men are 1.5 times more likely to have Parkinson's disease than women





# Motor Symptoms

- **Stiffness (Rigidity)**
- **Slowness (Bradykinesia)**
- **Resting Tremor**
- \*Not everyone experiences all three of these, but Bradykinesia is ALWAYS present
- Walking Problems
- Balance and/or Coordination Difficulties

# Non-Motor Symptoms

- Autonomic Dysfunction
  - Constipation
  - Orthostatic Hypotension
  - Sweating Problems (Excessive Perspiration)
- Mood and Thinking Changes
  - Apathy
  - Memory and Cognition Problems
  - Mood Changes and Disturbances
  - Psychosis

# Clinical Practice Guidelines

- Improve clinical outcomes<sup>3</sup>
- Reduce variability in clinical practice<sup>4</sup>
- Increase use of known effective interventions<sup>3</sup>
- Provide greater cost effectiveness<sup>3</sup>
- Increase transparency of evidence to justify interventions<sup>2</sup>
- Legitimize profession in the eyes of external stakeholders<sup>4</sup>
- Provide quick access to the synthesis of evidence<sup>5</sup>
- Give the clinician direct access to the knowledge-base of the experts<sup>5</sup>
- Allow one to self-assess their current practice<sup>5</sup>
- Assist with developing direction of future clinical research<sup>5</sup>

# Clinical Practice Guidelines for Parkinson's Disease

- APTA Clinical Practice Guidelines (CPGs) for Parkinson's Disease (PD) currently in development
- The European Physiotherapy Guideline for Parkinson's Disease developed in 2014

[SHJ Keus EU Guideline Parkinson 201412 Guideline \(parkinsonnet.nl\)](#)



# Classifications of Evidence and Recommendations

The GDG graded the recommendations as 'strong' or 'weak'

- reflecting the generalizability of the effects among PwP
- the extent to which the benefits outweigh the risks and/or undesirable effects (costs, burden of treatment, falls)
- the availability of the specified treatment
- the values and preferences of PwP and therapists, if known

# Conventional Physiotherapy

- Under Conventional physiotherapy, the Guideline Development Group (GDG) has categorized all physiotherapist-supervised active exercise interventions, targeting gait, balance, transfers or physical capacity, or a combination thereof.

# Conventional Physiotherapy recommendations

- *GRADE-based recommendations for conventional physiotherapy*
- *Strong recommendation for using conventional physiotherapy to improve:*
  - *walking speed*
  - *muscle strength (torque and weight; knee extensors)*
  - *movement functions (UPDRS III)*
- *Weak recommendation for using conventional physiotherapy to improve:*
  - *functional mobility (TUG)*
  - *balance capacity (BBS, FR)*

# Conventional Physiotherapy recommendations

*Weak recommendation against using conventional physiotherapy to improve:*

- *stride/step length*
- *cadence*
- *walking distance*
- *freezing of gait (FOG-Q)*
- *timed turn*
- *balance performance (FES, ABC)*
- *falls*
- *activity levels*
- *quality of life (PDQ-39, EQ-5D)*

# GDG advice: conventional physiotherapy

- Set and agree upon individual, SMART goals in collaboration with the pwp (also in case of group treatment)
- Train for a minimum of eight weeks, three times a week for 45 minutes
- Provide physiotherapist supervised training, supported by self-supervised exercising on other weekdays: facilitate a home exercise program, using an Exercise Diary (Appendix 5.6): consider group treatment (Appendix 7)
- Base decision for group or individual treatment on the pwp's treatment goal, abilities, motivation and preferences, as well as external factors such as the availability of exercise groups
  - Groups: focus on prevention and general improvement of physical capacity and functional mobility; consider Practice (6.5); to increase exercise confidence and support pwp to move on to a community exercise group or non-supervised exercising at home; to learn from peers; for social aspect (also for carers) and fun; adjust group size to treatment goals and levels of functioning of the pwp in the group, on average eight; monitor safety issues
  - Individual: in case of need for individual instruction and attention, as well as limited distraction by the environment; consider Practice (6.5) and Movement strategy training (6.6) for circumstance-specific activity limitations



# ***GDG advice: conventional physiotherapy***

- *Select specific exercises based on individual goals, preferences and feasibility, considering:*
  - *Standing up from, and sitting down onto the floor*
  - *Standing and walking on foam, with and without perturbation (pushes & pulls) to the trunk*
  - *Sitting down onto and rise from a chair (while dual tasking)*
  - *Getting into and out of bed*
  - *Rolling over in bed*
  - *Walking taking large steps, with large amplitude arm swings (consider Nordic walking / pole striding)*
  - *Walking around and over obstacles*
  - *Walking with sudden stops and changes in walking direction, including walking backwards*
  - *Walking and keeping balance while dual tasking, such as talking, carrying an object or turning head left to right toward wall mounted dots or photos and telling what is seen*
  - *Turning round in open and narrowed, small spaces: when pwp are at fall risk, aim for turning in a wide arc rather than a sharp change of direction (pivot turn)*
  - *Climbing step or stairs*

# GDG advice: conventional physiotherapy

- *Gradually increase intensity and beware of under dosed prescription of exercising:*
  - *Based on perceived exertion: on Borg Scale 6-20 from 13 (moderate intensity) to 14 (in case of beta-blockers use) or 17 (hard intensity)*
  - *Based on heart rate: increase exercise duration or percentage of the maximum heart rate, trained between 40 to 60% for moderate intensity exercising, and 60 to 80% for vigorous intensity exercising*
  - *Based on repetitions: increase in load, speed and number of repetitions from 1 to 3 sets of 8 to 15 repetitions at 60% to 80% of the one repetition maximum (or, if not feasible, the four repetitions maximum)*
- *If applicable, training use of (walking) aids to support exercising*
- *If feasible and safe, support pwp towards non-physiotherapist supervised exercising with intermittent follow-up; discuss this early in a treatment period to set realistic expectations*

## Details to the GDG advice

- The recommendations are based on 27 controlled clinical trials (CCTs) in which 1139 pwp participated, most with a Hoehn and Yahr stage of 1 to 3
- Exercises were often part of functional mobility training. Others focused on muscle power or strength, on high-amplitude movements (LSVT-BIG), or on gait, using Nordic walking

# Treadmill Training

- *Strong recommendation for using treadmill training to improve:*
  - *walking speed*
  - *stride length*
- *Weak recommendation for using treadmill training to improve:*
  - *walking distance*
  - *balance capacity (BBS)*
- *Weak recommendation against using treadmill training to improve:*
  - *cadence*
  - *gait related functional mobility (climbing stairs or a 8.8cm step)*
  - *knee extensors muscle strength (torque)*
  - *movement functions (UPDRS III)*

# ***GDG advice: treadmill training***

- *Set and agree upon individual, SMART goals in collaboration with the pwp (also in case of group treatment)*
- *For safety reasons:*
  - *Ensure that pwp have the cognitive and physical ability to utilise the treadmill, understand and use the necessary safety precautions*
  - *Consider supervised or non-physiotherapist supervised treadmill training taking into account cognitive and physical ability*
  - *Use an overhead harness or dead man's switch, such as a magnet attached to a cord that clips to the pwp which cuts power to the treadmill when pulled at*
  - *In pwp with freezing of gait, take care when accelerating and decelerating*



## GDG advice: treadmill training

- *Train at minimum four weeks, three times a week for 30 minutes*
- *Contents of training:*
  - *Ask pwp to focus on large steps*
  - *Focus on attention and provide augmented feedback such as by using cues*
  - *Consider adding a cognitive dual task while asking pwp to maintain stride length*
  - *Consider placing a mirror in front of the treadmill to provide visual feedback about body posture*
- *Gradually increase intensity and beware of under dosed prescription of exercising:*
  - *Based on perceived exertion: on Borg Scale 6-20 from 13 (moderate intensity) to 14 (in case of beta-blockers use) or 17 (hard intensity)*
  - *Based on heart rate: increase exercise duration or percentage of the maximum heart rate, trained between 40 to 60% for moderate intensity exercising, and 60 to 80% for vigorous intensity exercising*
  - *Based on walking speed: from 60% to 80% of the 6MWD walking speed*
- *If treadmill training is physiotherapist-supervised, support pwp towards non-physiotherapist supervised treadmill training with intermittent follow-up, if feasible and safe; discuss this early in a treatment period to set realistic expectations*

# Details to the GDG advice for Treadmill Training

- These recommendations are based on 11 CCTs in which 259 pwp participated, most with a Hoehn and Yahr stage of 1 to 3
- Focus on attention to task and movement; provide augmented feedback, and concurrent feedback on performance

# Dance

- *Weak recommendation for using dance to improve:*
  - *functional mobility (TUG - tango only)*
  - *balance capacity (BBS, Mini-BESTest)*
- *Weak recommendation against using dance to improve:*
  - *walking speed*
  - *stride length*
  - *walking distance*
  - *freezing of gait (FOG-Q)*
  - *quality of life (PDQ-39)*
  - *movement functions (UPDRS III)*

# GDG advice: Dance

- *Set and agree upon individual, SMART goals in collaboration with the pwp*
- *Train a minimum of 10 weeks, twice a week for 60 minutes*
- *Contents of dance:*
  - *Large amplitudes of movement*
  - *Starts, stops and turns*
  - *Single leg standing*
  - *Weight shifting*
  - *Controlled displacement of the centre of mass over the base of support*
  - *Backward walking*
  - *Walking in confined spaces*
  - *Stepping in multiple directions*
  - *Complex movement sequences*
- *Backward stepping, as common in tango may induce falling: take caution when selecting pwp for tango classes and adjust the specific contents of the tango dancing to the pwp' impairments and activity limitations.*
- *If dance is physiotherapist-supervised, support pwp towards non-physiotherapist supervised dance with intermittent follow-up, if feasible and safe; discuss this early in a treatment period to set realistic expectations*

## Details to the GDG advice for Dance

- The recommendations are based on three CCTs in which 119 pwp participated, most with a Hoehn and Yahr stage of 1 to 4
- The music provides an external rhythm, which can be considered as auditory cueing. As
- Dance requires high-level multitasking and progressive motor skill learning, and can be both physically and cognitively challenging.



# Martial arts: Tai Chi

- *Strong recommendation for using Tai Chi to improve:*
  - *movement functions (UPDRS III)*
- *Weak recommendation for using Tai Chi to improve:*
  - *number of falls*
  - *balance capacity (BBS)*
  - *walking speed*
  - *stride length*
  - *walking distance*
  - *functional mobility (TUG)*
  - *muscle strength (torque)*
  - *standing related balance capacity (Functional Reach)*

The recommendations are based on three CCTs in which 200 pwp participated, most with a Hoehn and Yahr stage of 1 to 4

# GDG advice: Tai Chi

- *Set and agree upon individual, SMART goals in collaboration with the pwp*
- *Train for a minimum of 24 weeks, twice a week for 60 minutes*
- *Contents of Tai Chi:*
  - *Combine deep breathing and relaxation with slow and rhythmic movements*
  - *Include single leg standing, weight shifting, controlled displacement of the centre of mass over the base of support, stepping in multiple directions and complex movement sequences*
  - *Aim for large amplitudes of movement*
- *If Tai Chi is physiotherapist-supervised, support pwp towards non-physiotherapist supervised Tai Chi with intermittent follow-up, if feasible; discuss this early in a treatment period to set realistic expectations*

## Whole body vibration

- *strong recommendation against using WBV because of safety considerations*
- The recommendation is based on two CCTs in which 42 pwp participated with an unknown Hoehn and Yahr stage
- In pwp, WBV showed no effects with a confidence interval excluding 0.78;95. Moreover, WBV devices are likely to exceed what is considered safe vibration for even brief (a few seconds a day) exposure resulting in both acute and chronic injury to the musculoskeletal, circulatory and nervous systems

# Dual Task Training

- Due to no CCTs available when these recommendations were made, no GRADE-based recommendation available
- Cognitive tasks known to cause gait interference in older people:
  - Verbal fluency: for example ask the pwp to name to name cities starting with a specific letter
  - Discrimination and decision making tasks: for example ask the the pwp to change gait direction to the right when you say yellow and stop walking when you say red
  - Working memory tasks: for example ask the pwp to distract number by three starting at 90
  - Mental tracking tasks: for example, tell the pwp a story and ask the pwp how many times you use a specific word
  - Reaction time tasks

# Movement Strategy Training

## *GRADE-based recommendations for cueing and attentional strategies*

- *Strong recommendation for using cueing for gait to improve:*
  - *walking speed*
- *Weak recommendation for using cueing for gait to improve:*
  - *step length*
  - *gait related balance capacity (DGI)*
  - *movement functions (UPDRS III; UPDRS posture & gait score)*
  - *freezing of gait (FOG-Q)*
- *Weak recommendation for using cueing during transfers to improve:*
  - *functional mobility (timed sit-to-stand)*
- *Weak recommendation against using cueing for gait to improve:*
  - *stride length*
  - *cadence*
  - *functional mobility (TUG)*
  - *standing related balance capacity (Functional Reach)*
  - *balance performance (FES, ABC)*
  - *quality of life (PDQ-39)*
- The recommendations are based on nine CCTs in which 378 pwp participated, most with a Hoehn and Yahr stage of 2 to 4



## GDG advice: cueing and attentional strategies

- *set and agree upon individual, SMART goals in collaboration with the pwp (also in case of group treatment)*
- *Provide physiotherapist supervised training, supported by self-supervised exercising on other weekdays: facilitate a home exercise program, using an Exercise Diary (Appendix 5.6)*
- *Train cueing for a minimum of three weeks, three times a week for 30 minutes - longer for attentional strategies and when people are in advanced stages*
- *Start with exploring the pwp's own tricks and tips*
- *Examples of cueing strategies:*
  - *Visual: stepping over strip(s) of tape on a floor, someone's foot or a laser line projected on the floor*
  - *Auditory: walking on the beat of a metronome or pwp preferred music such as by using a smartphone*
  - *Tactile: walking on the vibration rhythm of a vibrating wrist band*
- *Frequency of cueing:*
  - *Use the 6MWD or 10MW to determine baseline step frequency*
  - *To improve walking distances (specifically outside the pwp's home) in non-freezers: explore cueing frequencies up to 10% above baseline frequency*
  - *To improve gait stability during functional and complex activities, mostly inside the pwp's home: explore cueing frequencies up to 15% below baseline frequency*
  - *To improve gait in freezers: explore cueing frequencies up to 10% below baseline frequency*

## ***GDG advice: cueing and attentional strategies***

- *Examples of attentional strategies*
  - *Thinking about taking big steps*
  - *Choosing a point of reference to walk towards*
  - *Making wide turns (arc versus pivot)*
  - *Lifting knees high up*
- *Examples of attentional strategies to initiate movement:*
  - *Rocking from left to right before starting to walk*
  - *Combine rocking with the instruction (or thinking) of taking a big step*
  - *Taking a step backwards before starting to walk*
  - *Suddenly swinging the arms in front ('pointing the direction')*
  - *For bed transfers: Rocking bend knees from left to right before rolling over*
  - *For chair transfers: Rocking trunk forwards and backwards before rising from a chair*
- *If feasible and safe, support pwp towards non-physiotherapist supervised cueing with intermittent follow-up; discuss this early in a treatment period to set realistic expectations*

# Strategies for complex motor sequences

## *GRADE-based recommendations for strategies for complex motor sequences*

- *Strong recommendation for using strategies for complex motor sequences to improve:*
  - *functional mobility (PAS and PAS chair transfers)*
- *Weak recommendation for using strategies for complex motor sequences to improve:*
  - *stride length*
  - *patient-based treatment effect*
- *Weak recommendation against using strategies for complex motor sequences to improve:*
  - *walking speed*
  - *step length*
  - *cadence*
  - *movement functions (UPDRS III)*

The recommendations are based on six CCTs in which 210 pwp participated, most with a Hoehn and Yahr stage of 1 to 4

## ***GDG advice: strategies for complex motor sequences***

- *Set and agree upon individual, SMART goals in collaboration with the pwp (also in case of group treatment)*
- *Provide physiotherapist supervised training, supported by self-supervised exercising on other weekdays: facilitate a home exercise program, using an Exercise Diary*
- *Train for a minimum of three weeks, three times a week for 30 minutes*
- *Train task-specific*
- *Start with exploring the pwp's own tricks and tips*

# ***GDG advice: strategies for complex motor sequences***

- *Train at the location where the pwp's activity limitations are present (often at the pwp home), or when this is impossible, mimic this environment*
- *Support strategies for complex motor sequences by using cues*
- *Steps to consider:*
  - *Observe the pwp in performing the activity; analyse limited components*
  - *Agree with the pwp about the most optimal (mostly four to six) movement components*
  - *Summarizes the sequence of components: use key phrases, support with visuals*
  - *Physically guide the pwp in the performance of the selected components*
  - *Ask the pwp to rehearse the consecutive components aloud*
  - *Ask the pwp to use a motor imagery of the consecutive movement components*
  - *Ask the pwp to carry out the components consecutively, consciously controlled*
- *If feasible and safe, support pwp towards non-physiotherapist supervised cueing with intermittent follow-up; discuss this early in a treatment period to set realistic expectations*

## Next Steps...

- Create an Infographic for PwP to educate about the benefits of Physical Therapy
- Be on the look out for APTA's CPG for PD
- Any questions?



# References

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