ExerciseRx Parkinson

What is the best exercise to improve WALKING in PD?

1

The best exercises are those that closely match what you want to improve.

If you want to improve walking, the more the exercise mimics walking, the more helpful it will be.

See which options you have and choose/add the one closest to walking.

2

3

The best exercise for walking is one that improves YOUR specific challenges related to your walking.

4

In the clinic

In daily life

5

What interventions have been study for walking in Parkinson's population?

1.

What interventions can be applied specific for your x, y, z challenges?

2.

6

Current evidence-based recommendations

Gait	Evidence level
Treadmill Training for gait speed.	EFNS/ MDS - Level I
Cueing Training and Strategies.	EFNS/ MDS - Level II
Cueing Training for dual task.	EFNS/ MDS - Level III
Gait Re-education	NICE - Level II
Exercise-based interventions.	EFNS/ MDS - Level II

Guidelines: European Federation of Neurological Societies & Movement Disorder Society (EFNS/MDS-ES) | National Institute for Health and Clinical Excellence (NICE) | American Academy of Neurology (AAN) |Movement Disorder Society (MDS) | **European Physiotherapy Guidelines for PD**

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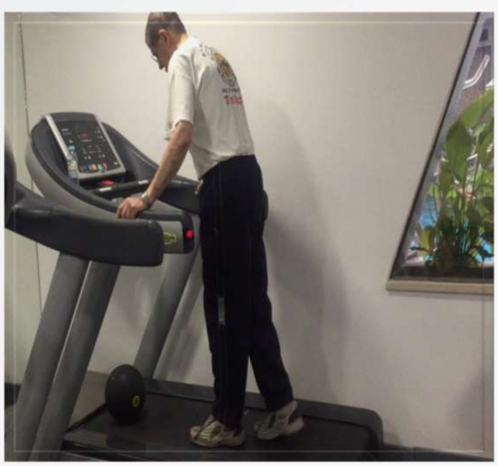
Treadmill training for patients with PD results in sustained gains in **gait speed & stride length** (Class II).

The combination of **4 weeks of treadmill training and cueing** induces even greater benefits for freezing of gait than cueing alone (Class II).

9

“Different” cueing possibilities



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Multidirectional treadmill & balance training

Bryant MS 2016 Dec; 8(12):1151-1158. Acute and Long-Term Effects of Multidirectional Treadmill Training on Gait and Balance in Parkinson Disease.

11

12

Why do people monitor Heart Rate (HR)?

- Ensures safe exercise intensity
- Maximizes cardiovascular benefits
- Helps manage fatigue and symptoms

HRmax = 220 - Age
Moderate-Intensity Exercise
Target Heart Rate: 50–70% of max

Why is monitoring Heart Rate in PD limited?

- Beta-blockers and medications may lower HR response
- Autonomic dysfunction in PD can impact heart rate regulation
- Rate of Perceived Exertion Scale (RPE scale) can be used instead of HR

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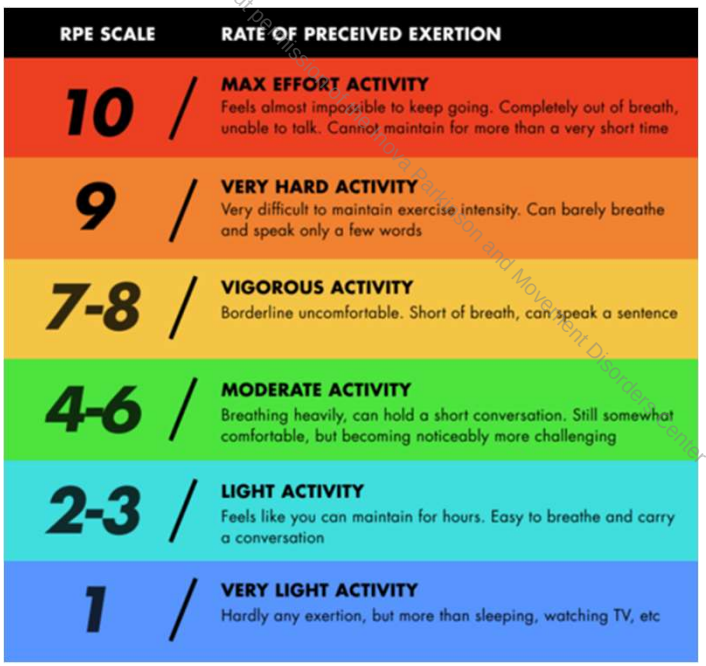
Rating of Perceived Exertion (RPE)



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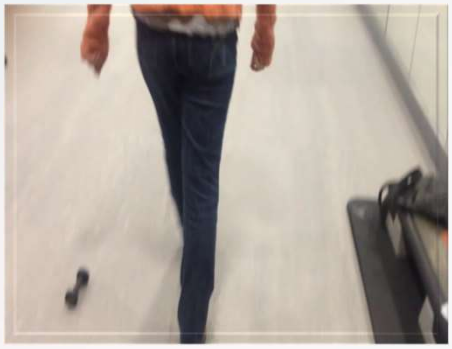
Cueing Strategies



Cued gait training in the home is probably effective in reducing the **severity of freezing** of gait (Class II).

16

Current evidence-based recommendations

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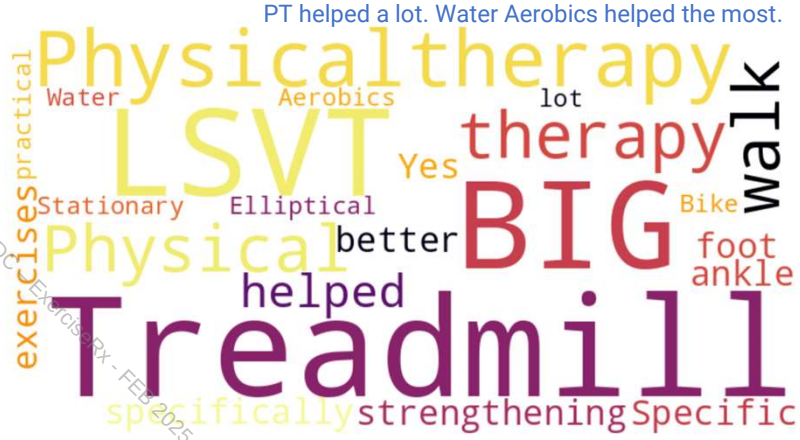
Have you attempted specific treatments or exercise programs to improve your walking?

from patient questionnaires

PT helped a lot. Water Aerobics helped the most.



Walking 2 Miles with 5# weights on ankles.

19

So how do I know what to do? (or can I do more)

Identify the **specific challenges you experience** while walking and define training strategies to improve them.

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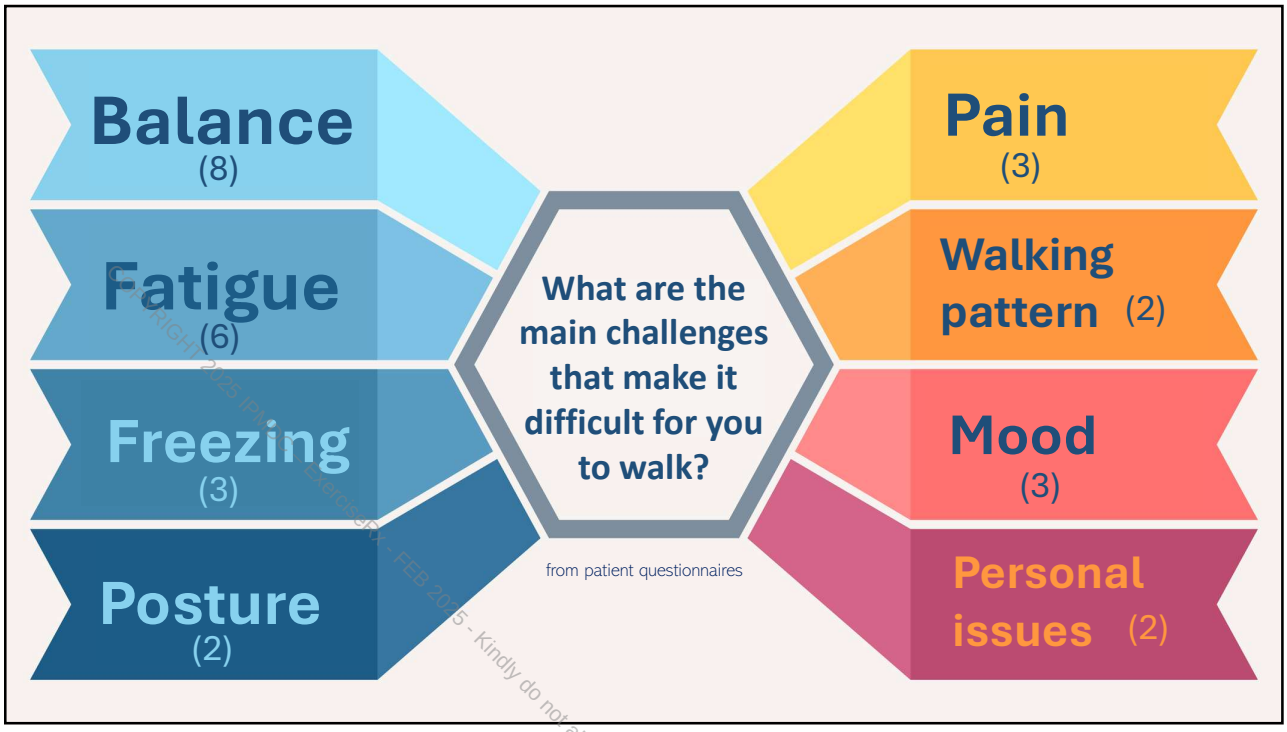

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Balance-related

"To be able to walk with better balance" (51,9%)

22

Comments related to balance

from patient questionnaires

- Balance (3)
- Feel at times off balance.
- Fear of Falling, Difficulties with balance.
- High risk of falling backward.
- Lack of balance, short strides, freezing, visual-perceptual/orientation difficulties.
- Balance, fatigue, curling under of toes, tremors.
- Want to walk with better balance.

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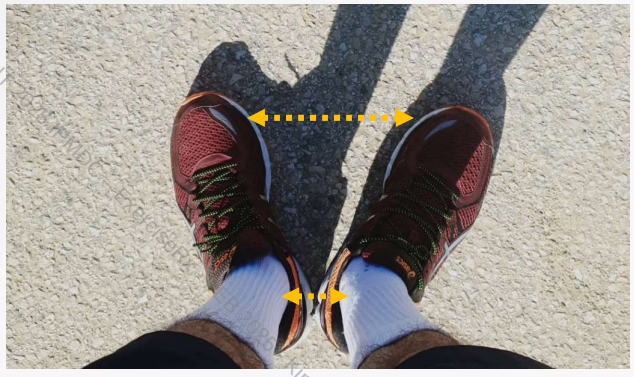
Balance

24

step width



Narrow-based gait

↓

Balance

25

Walking with reduced **trunk motion** resulted in decreases in **step width**.

Buurke et al. Gait & Posture 103 (2023) 113–118

Reduced trunk motion

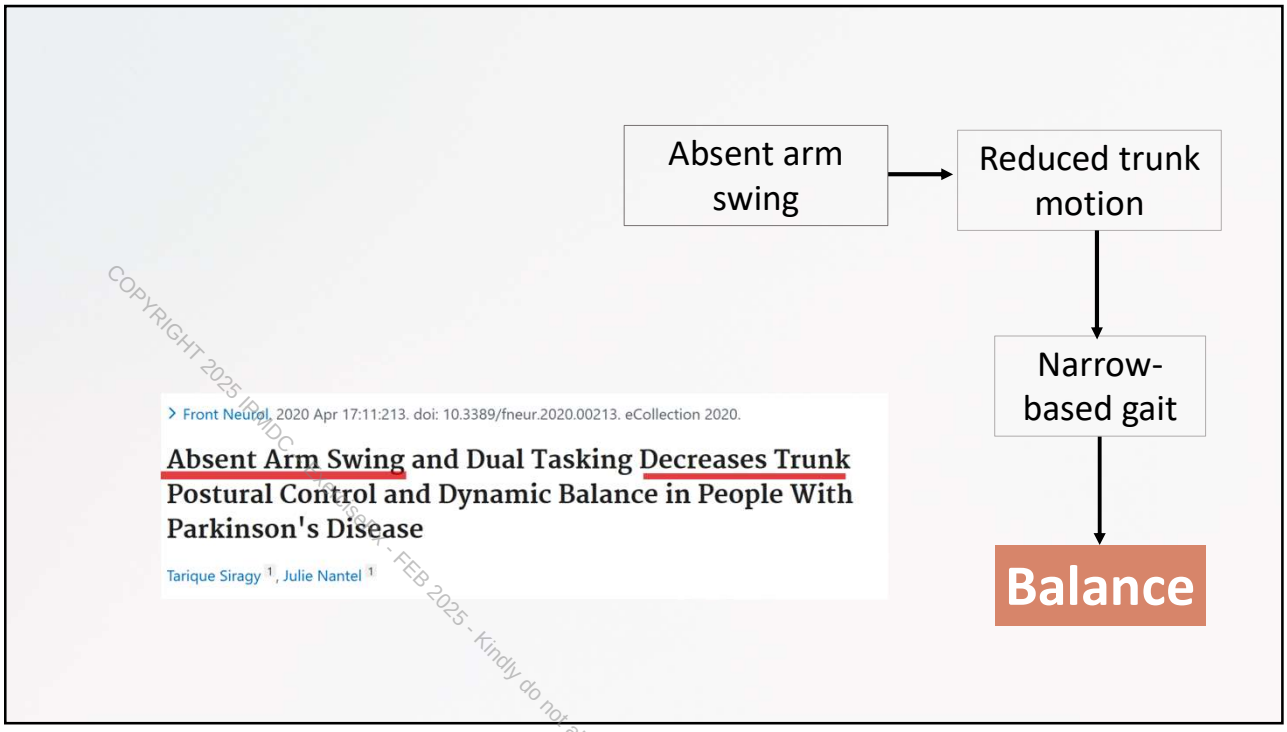
↓

Narrow-based gait

↓

Balance

26



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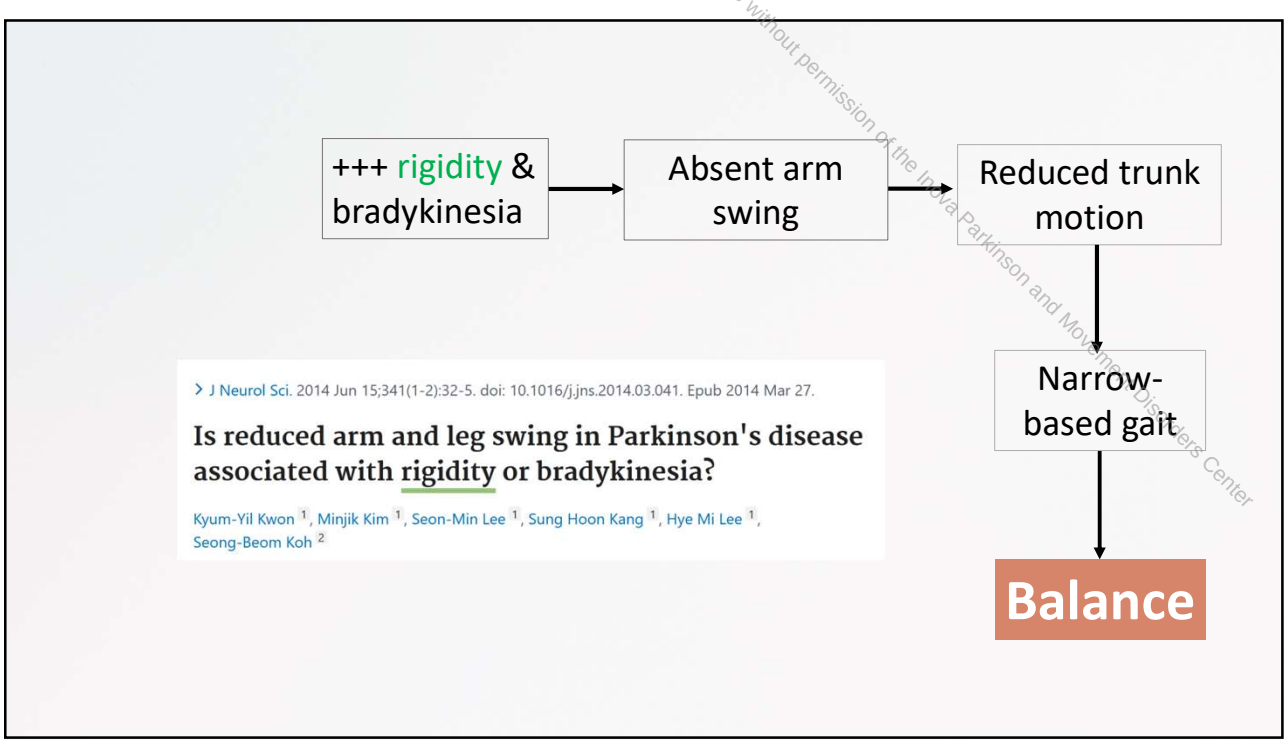

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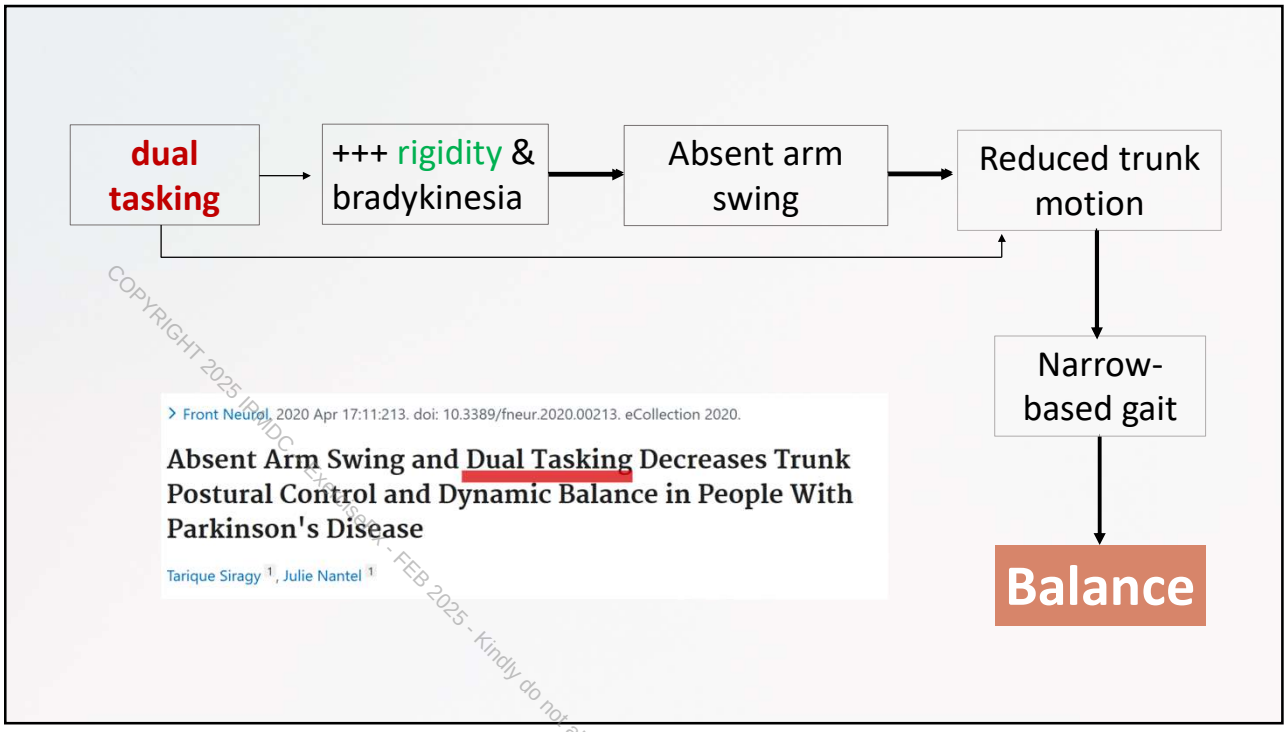

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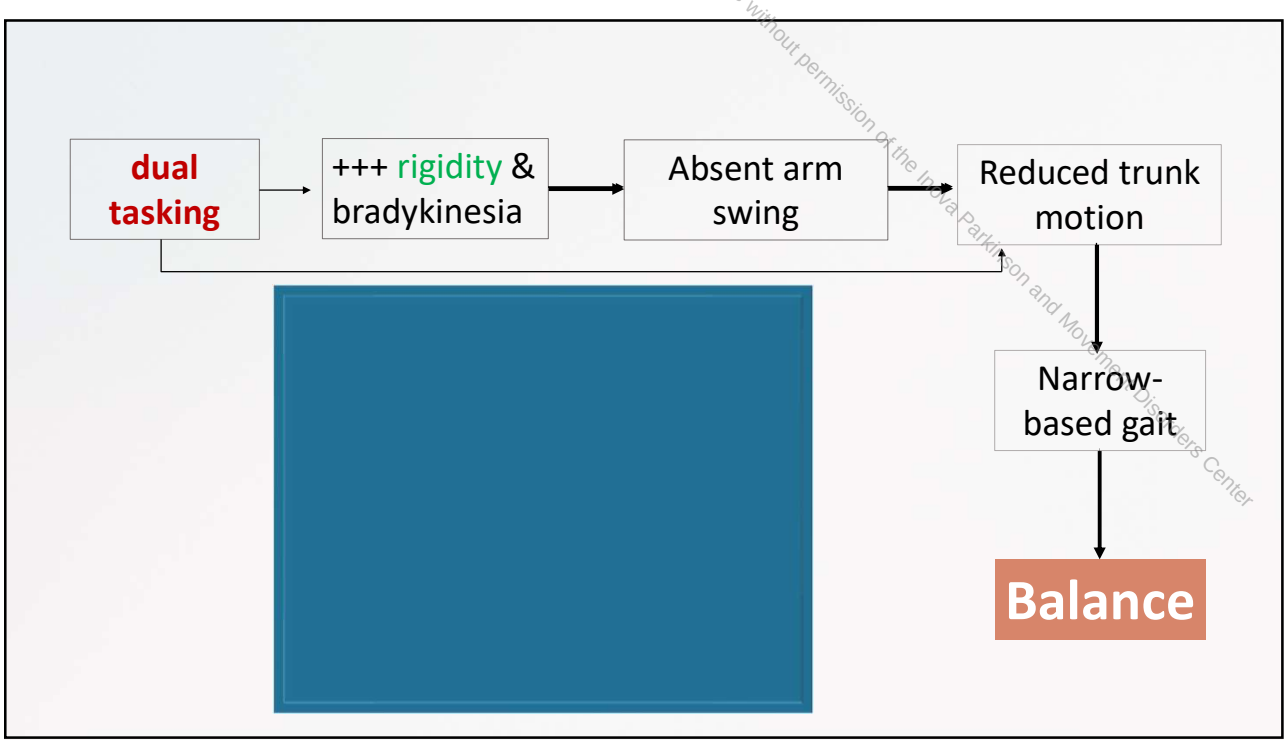

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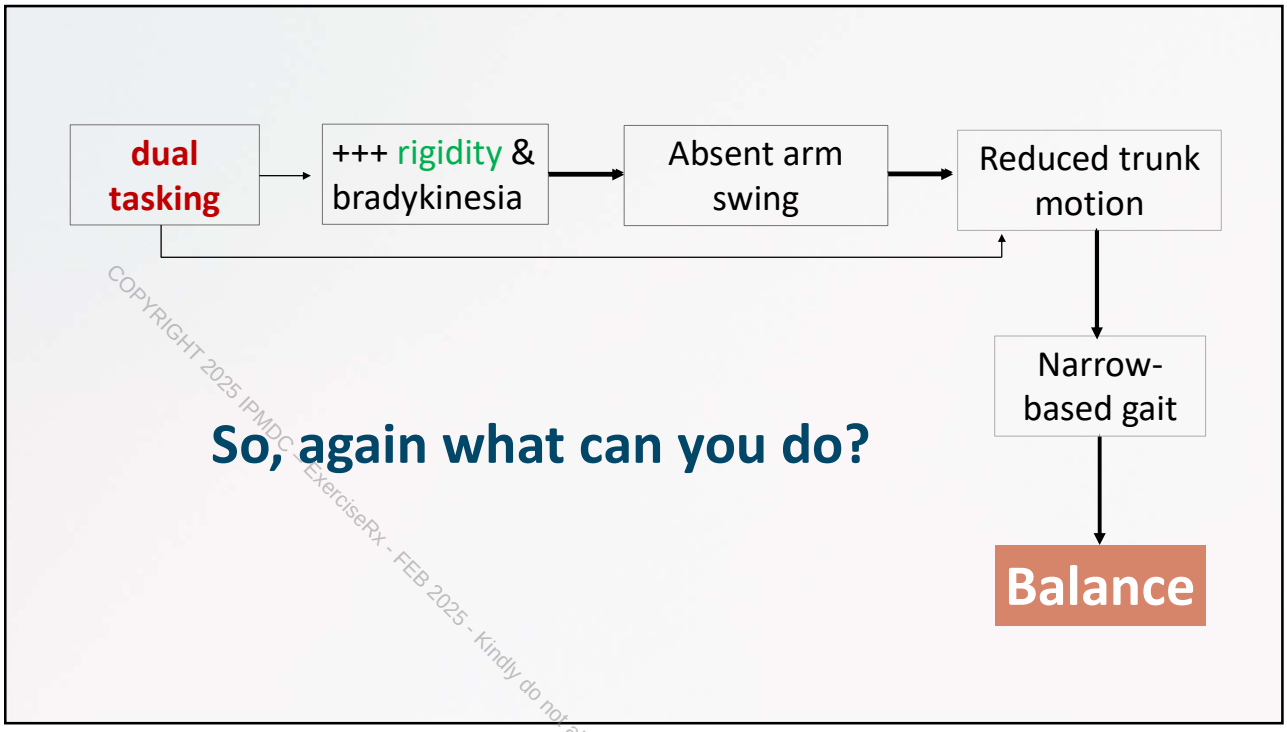

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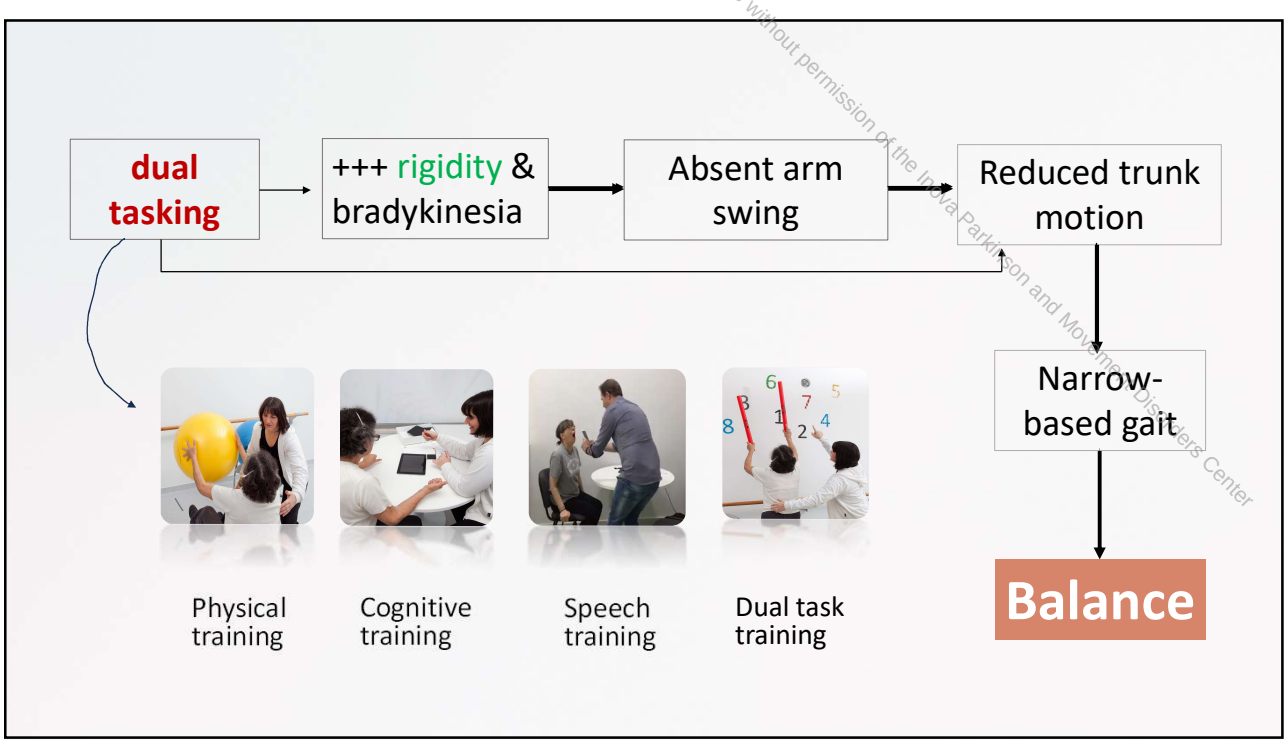

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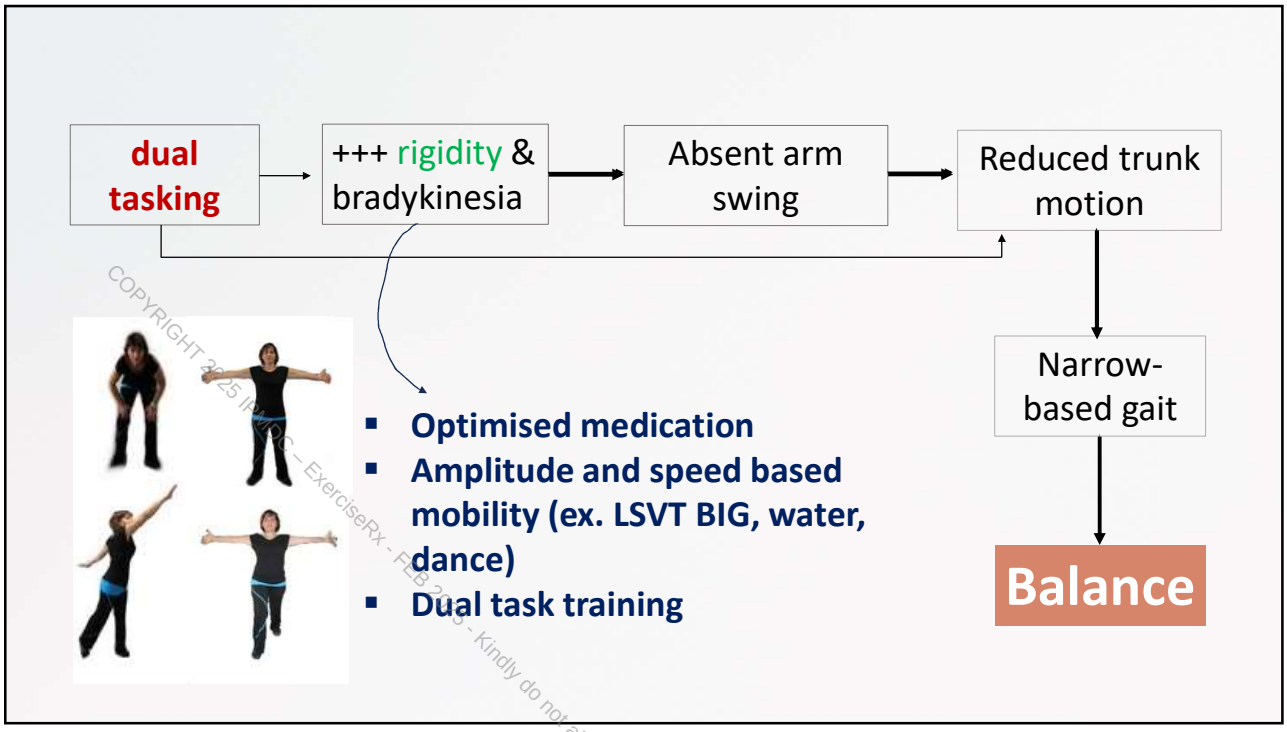

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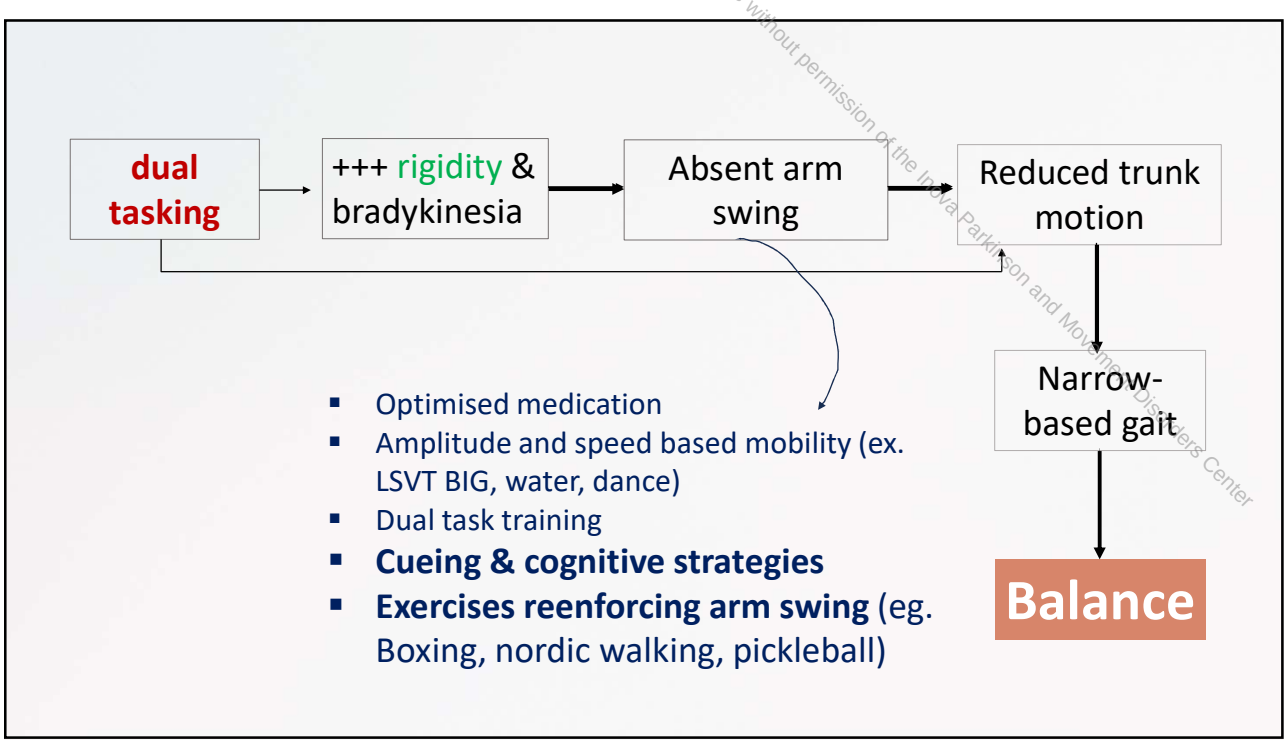

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Example case – reduced arm swing exercise-based interventions

Pole walking

Tandem Pole walking

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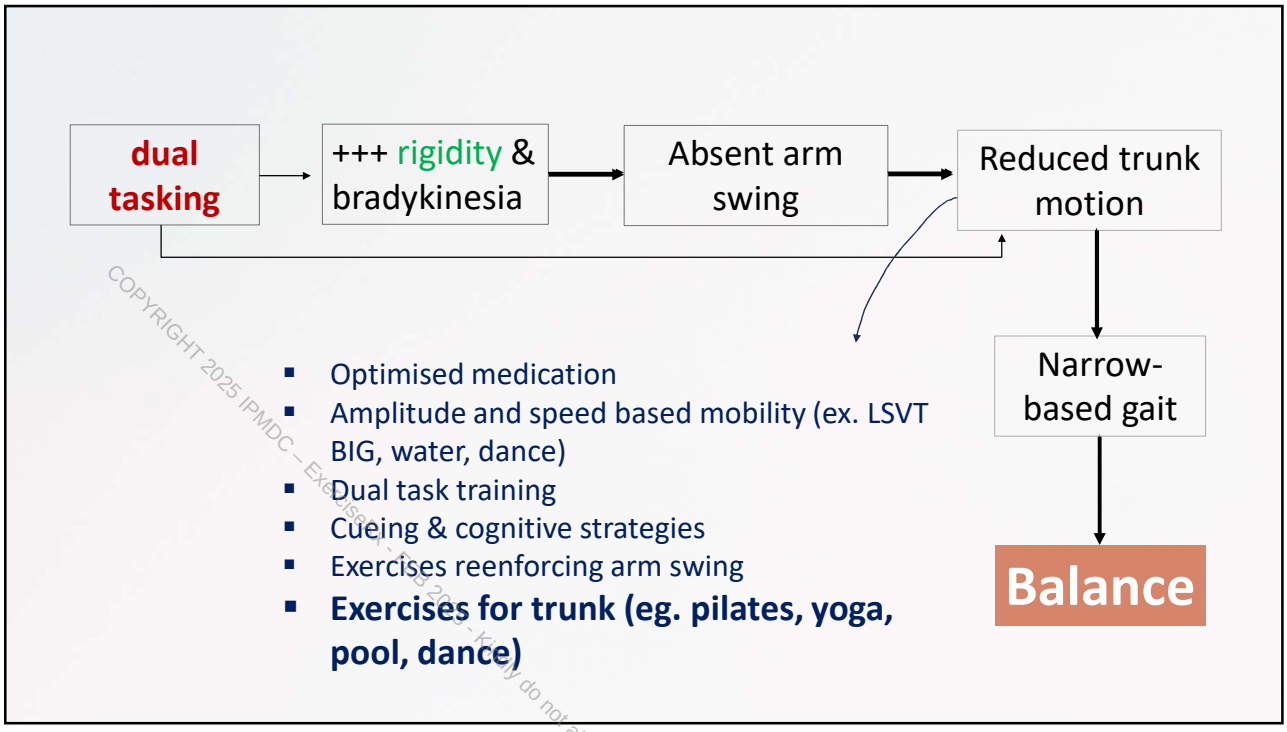

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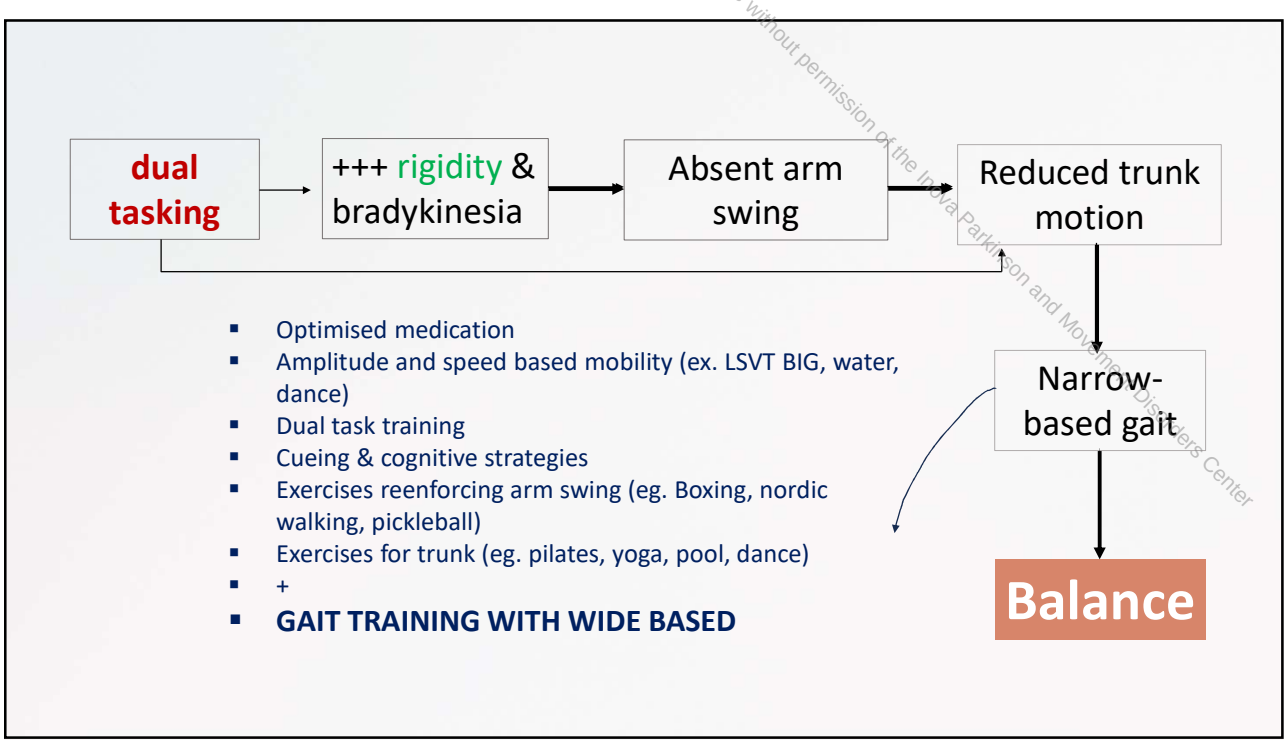

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Posture-related

"Standing erect when walking."

"I struggle to maintain good posture".

39

Quick tips:

Frequent resting (reset) periods

Reducing external distractions

External support

40

Using poles allows for:

- Better arm swing, trunk rotation, large stride, walking faster pace
- Potential for more moderate or vigorous exercise intensity
- Better inter-limb coordination

41

Fatigue-related

"To be able to walk longer distances without fatigue" (51,8%)

42

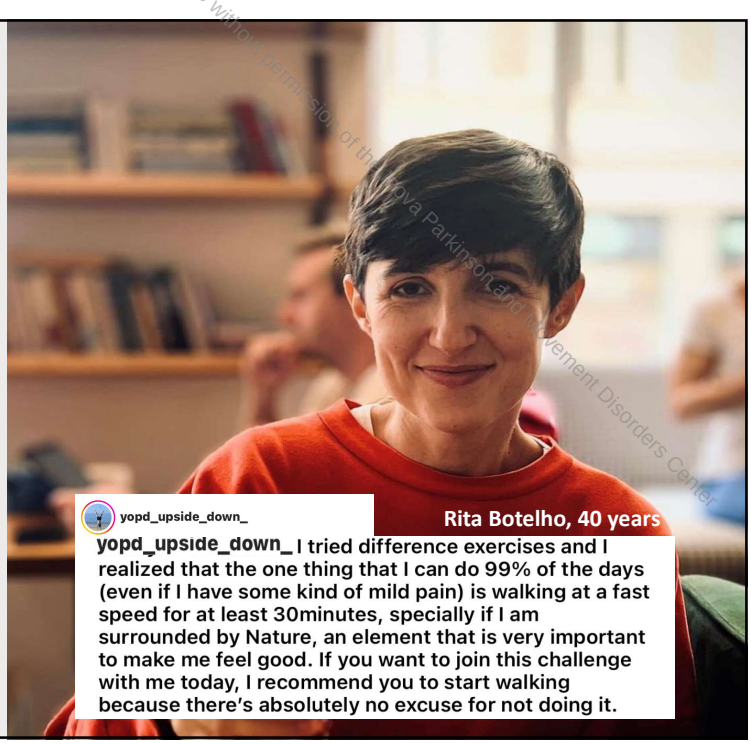
Comments related to fatigue

from patient questionnaires

- **Fatigue**
- Balance, **fatigue**, curling under of toes, tremors
- **Fatigue** due to muscles not strong in upper back
- I get **tired** very after a couple of blocks. My back begins to hurt.
- Off time of medication

43

Consider daily walking as part of your exercise routine



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Do you do any scheduled walking as part of your exercise routine?

from patient questionnaires

Yes (Regular Walkers)

- Yes (4)
- Yes, I try to walk daily for 2 miles or more
- Yes, around 3 miles most days
- Every morning with my dog
- Yes, mostly on days not in group classes I walk in my neighborhood
- Everyday some walking either indoors or outdoors

Occasional/Conditional Walkers

- I usually walk once or twice a week
- Not really scheduled—just where it fits in the day
- As weather permits
- Not really, I walk when the weather permits.
- Kind of

No (Non-Walkers or Irregular Walkers)

- No (2)
- I do not at this point, but I should.
- Not yet, still recovering from surgery
- Not currently as I have just had knee replacement surgery.

45

Consider

- Resting breaks during walking routines
- How much exercise is realistic and sustainable.

46

Mood related

"To be able to walk to boost my mood"
(29,6%)

47

Comments related to mood

from patient questionnaires

- Apathy (just getting out the door), on/off fluctuations, weather, external distractions/multitasking (ie: at the airport)
- Lack of motivation
- often don't feel like it

48

Consider outdoor nature walks for better psychological well-being

Landscape and Urban Planning 209 (2021) 104061

Contents lists available at ScienceDirect

Landscape and Urban Planning

journal homepage: www.elsevier.com/locate/landurbplan

Research Note

Psycho-physiological responses of repeated exposure to natural and urban environments

Marc V. Jones [a,*], Christopher J. Gidlow [b], Gemma Hurst [b], Daniel Masterson [c], Graham Smith [b], Naomi Ellis [b], David Clark-Carter [b], Mika P. Tarvainen [d], Elizabeth C. Braithwaite [a], Mark Nieuwenhuijsen [e,f,g]

Simulated nature walks have been found to improve psychological well-being differently depending on the environment:

Pine forest walks improving happiness and calmness

Urban environments may decrease these feelings.

49

Consider if you prefer to walk alone, with a group, or with a professional.

from patient questionnaires

11 = alone
0= with a group
3= with family
1= friends
2= with therapist or coach or caregiver

"I like to walk with friends that understand the problem, but I slow them down so I tell them to go ahead, and they will, but they feel guilty".

50

Freezing-related

51

Comments related to freezing

from patient questionnaires

- When the PD medication is due.
- When I stand or turn around.
- While trying to enter an elevator or cross a street.
- Narrow spaces.
- Opening doors; anxiety when someone holds the door; fear that I might fall.
- Washing dishes / at the counter.

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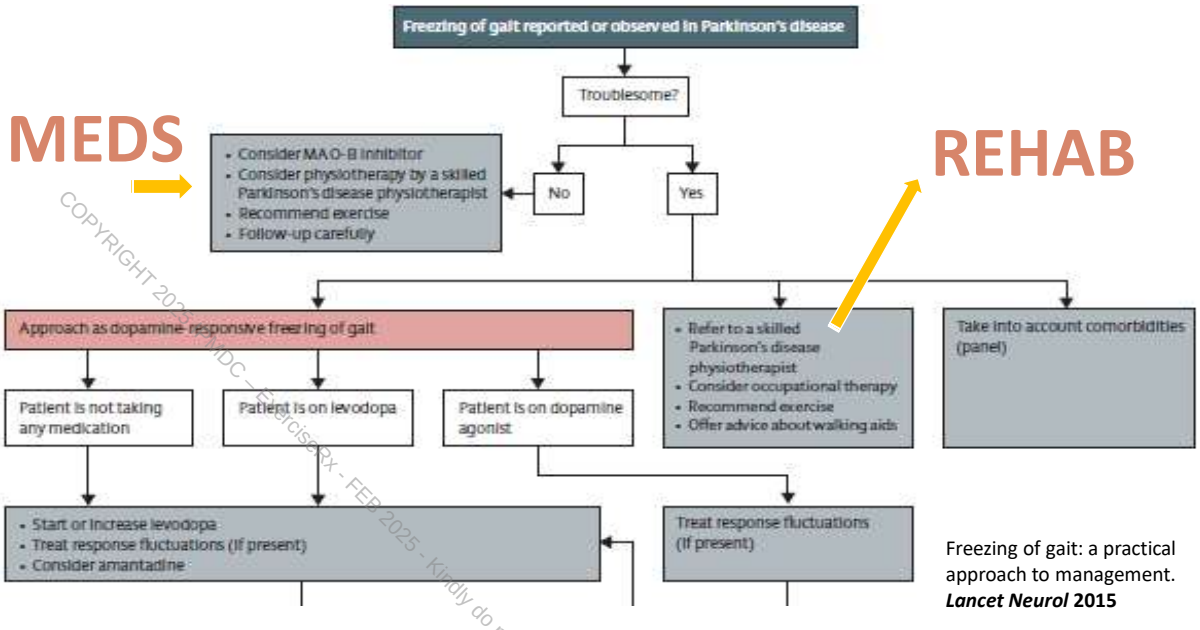

Freezing of gait: a practical approach to management. ***Lancet Neurol* 2015**

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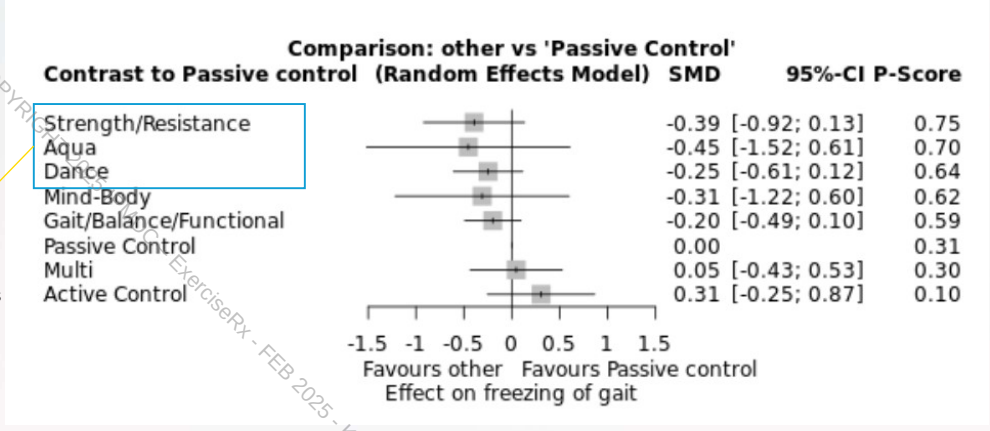
How do different types of exercise-based interventions affect **freezing of gait** differently?



Highest-ranked interventions

55

Pain related

"To be able to walk without any pain or discomfort" (55,6%)

56

Questions

from patient questionnaires

"How to be safe doing lots of walking as a Parkinson's patient with lower back stenosis & arthritis & foot pain. I do wear custom orthotics & have done so for decades".

Knee difficulties

Foot pain

Back pain

"Walking through pain. Including knee, hip and plantar fasciitis".

57

Others

Walking pattern:

- Shorter stride than in the past and remembering not to let my left foot scuff the ground occasionally.
- Shrinking gait

Weather

Finding time to do it.

58

Your Questions

59

Questions from questionnaires

“How to participate from a wheelchair?”

60

Questions from questionnaires

"Are there some simple exercises to help build up leg strength?"

61

Questions from questionnaires

"I would like to know what has worked for others".

62

What types of physical activities or exercises do you currently enjoy or participate in?

from patient questionnaires

63

Thank you for coming

64

Environmental Factors Affecting Walking

65

"What is the desired heart rate during exercise for Parkinson's patients?"

Question from the questionnaire

66

High-Intensity Exercise

HRmax = 220 - Age
Moderate-Intensity Exercise
Target Heart Rate: 50–70% of max

67

Moderate-Intensity Exercise

- Goal: Improve cardiovascular health & endurance
- Target Heart Rate: 50–70% of max HR (HRmax)
- HRmax = 220 - Age
- Example (Age 65): HRmax = 155 bpm
- → Target Zone: 78–109 bpm

68

High-Intensity Exercise

- Goal: Improve motor function & neuroplasticity
- Target Heart Rate: 70–85% of HRmax
- Example (Age 65): HRmax = 155 bpm
- → Target Zone: 109–132 bpm

69

Vigorous/HIIT Exercise

- Some studies suggest 80–90% of HRmax may offer greater benefits
- Requires medical clearance before participation
- Can be highly effective when safely applied

70

Other Considerations

- • RPE Scale (Rate of Perceived Exertion) can be used instead of HR
- • Beta-blockers and medications may lower HR response
- • Autonomic dysfunction in PD can impact heart rate regulation
- • Individualized exercise plans are recommended

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https://www.yahoo.com/lifestyle/walking-speed-tell-health-155804700.html?soc_src=social-sh&soc_trk=ma&guccounter=1

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Journal of Physiotherapy 67 (2021) 49–55

AUSTRALIAN PHYSIOTHERAPY ASSOCIATION

Journal of PHYSIOTHERAPY

journal homepage: www.elsevier.com/locate/jphys

Research

People with Parkinson's disease are more willing to do additional exercise if the exercise program has specific attributes: a discrete choice experiment

Serene S Paul [a], Colleen G Canning [a], Niklas Löfgren [b,c], Cathie Sherrington [d,e], Deborah C Lee [a], Julie Bampton [a], Kirsten Howard [e]

[a] Discipline of Physiotherapy, Faculty of Medicine and Health, University of Sydney, Sydney, Australia; [b] Function Area Occupational Therapy and Physiotherapy, Allied Health Professionals Function, Karolinska University Hospital, Stockholm, Sweden; [c] Department of Neurobiology, Care Sciences and Society, Division of Physiotherapy, Karolinska Institutet, Stockholm, Sweden; [d] Institute for Musculoskeletal Health, Faculty of Medicine and Health, University of Sydney, Sydney, Australia; [e] School of Public Health, Faculty of Medicine and Health, University of Sydney, Sydney, Australia

People with PD were more willing to participate in exercise programs that cost less, involve less travel, provide physical or psychological benefits and are supervised by qualified professionals.

https://doi.org/10.1016/j.jphys.2020.12.007

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