# **Thawing Out:** Strategies to Reduce Freezing

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# What is freezing?

- Freezing of Gait (FoG) is "a brief, episodic absence or marked reduction of forward progression of the feet despite the intention to walk" (1)
- Affects ~26% of early stage PD and ~80% of advanced stage PD (2)
- Freezing is a common cause for falls and injury (3, 4)
- Triggered by certain motor, cognitive and environmental factors e.g. turning, going through doorways, approaching an obstacle or destination such as a chair
- Can be triggered by emotional situations (5) (e.g. being under time pressure, stress, embarrassment)
- Ironically, the very symptoms of freezing also causes freezing episodes i.e. small quick steps, shuffling feet, asymmetrical stepping (6, 7, 8, 9, 10)

# Why do we freeze?

Mobility requires cognition (11, 12, 13)

| **Attention** (14) | **Executive Function** (15) | **Visuospatial Function** (16,17,18) |
|---|---|---|
| Divided Attention | Shifting | Visuoperceptual Abilities |
| Attention Switching | Inhibition | Visuoconstructional Abilities |
| Sustained Attention | | |
| Selective Attention | | |

Pharmacology considerations: FoG usually in the off state (but not exclusively), FoG may sometimes be worsened by levodopa (19)

# Barriers to treating freezing

Emotions during freezing episode perpetuates freezing

Cueing is commonly used for freezing but cognitive dysfunction limit the ability of People with PD to deploy these strategies in real life situations; also positive effects of cueing are lost over time when the cue is no longer novel (20, 21)

Risk of falls when training- fear, anxiety, stress

Impaired implicit motor learning make it difficult to learn new motor patterns, however still able to learn some new skills (22, 23)

# So what can we do?

**We know that:**

- Small, quick, asymmetrical steps can lead to freezing episodes
- Freezing is a result of multiple and complex cognitive, motor, emotional and environmental demands
- Benefits from cueing withdraw once cue is no longer novel

**Therefore:**

- Work on taking bigger steps and more symmetrical steps
- Practice motor skills in situations where dual-tasking may be involved, manipulating different environmental factors
- Utilize different types of cues (auditory, visual, tactile) to keep cues novel
- Try agility/obstacle courses for both mind and body (24)

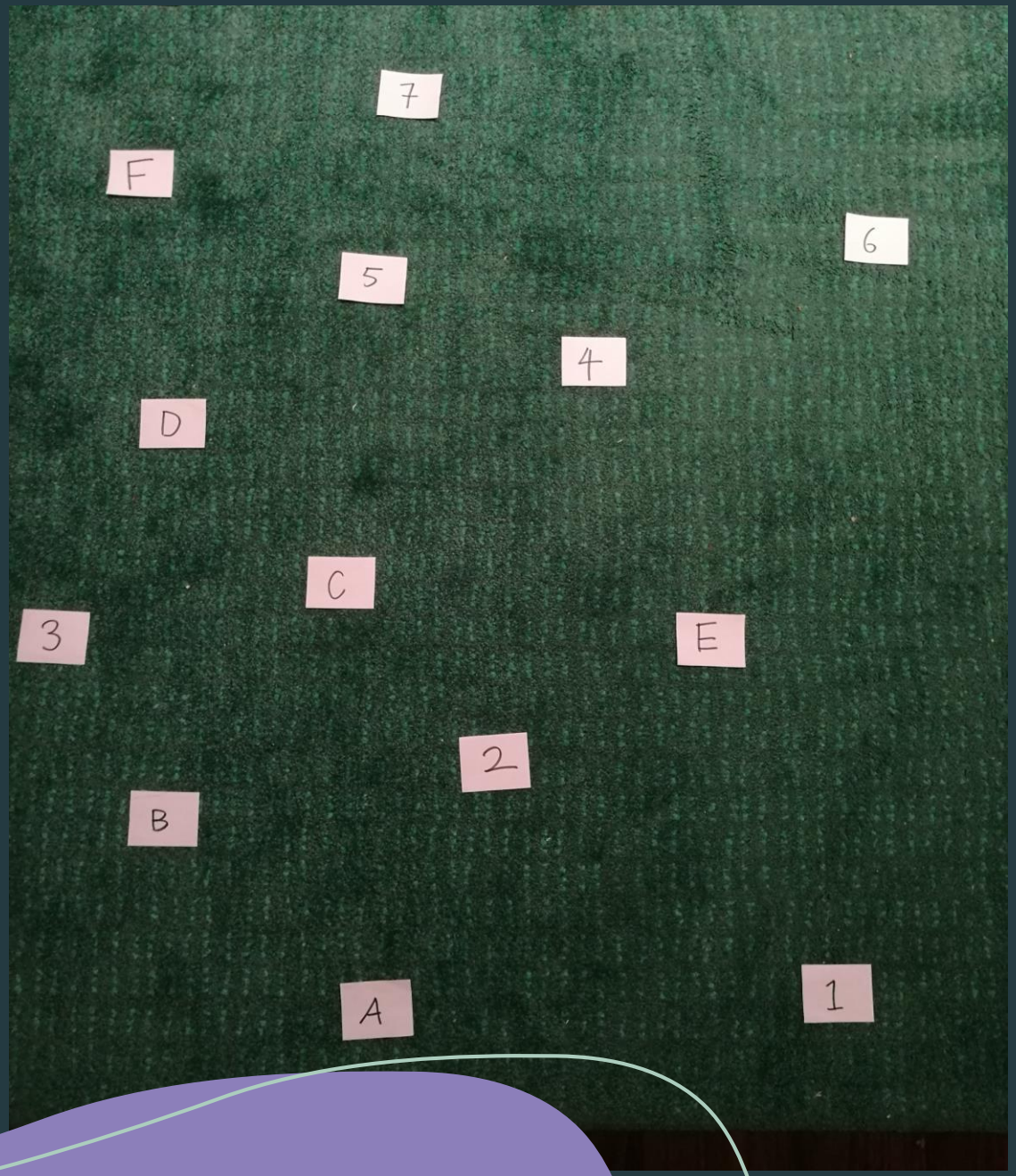
**Next few slides will give you some examples of things you can practice.**

# Dual-Tasking Exercises

**Simply dual-tasking:** doing a physical activity that involves coordination while performing a cognitive task

For example:

- Boxing combo while naming as many cities as you can think of starting from the letters ‘A’ to ‘Z’
- Lateral lunges while naming ‘items you find in an office’ starting from the letters ‘Z’ to ‘A’
- Walking around cones while counting backwards in 7’s starting from 100
- Stepping over obstacles while doing math problems e.g. 13+5-2




# Agility/obstacle courses for the body and mind

Tape numbers 1-10 and letters A-J on the floor.

Walk across the room stepping on ascending numbers and ascending alphabets alternatively i.e. 1-A-2-B-3-C… etc.

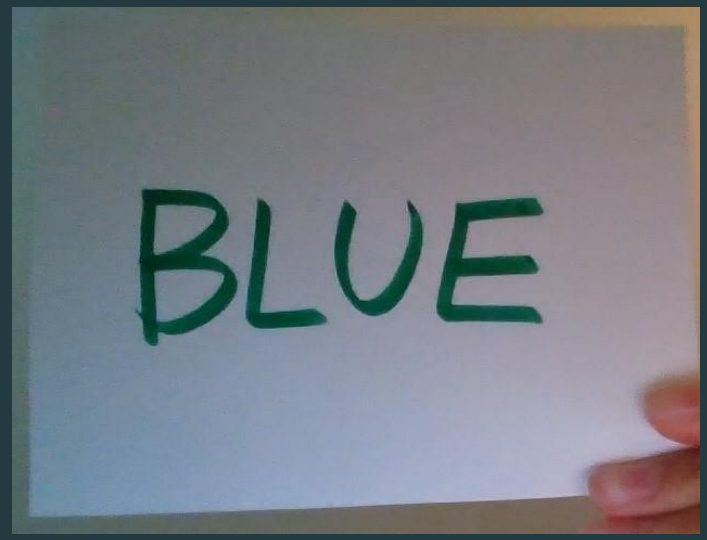
Place the targets further apart for a challenge.

You could also add in additional challenges e.g. roman numerals

# Agility/obstacle courses for the body and mind

Have a partner create Q-cards with names of colours written in various colours.

Complete a physical exercise, such as multidirectional lunges/steps, while reading the **colour** of the word presented on the Q-card.






# Agility/obstacle courses for the body and mind

Obstacle course simulating situations where freezing occurs i.e. hallways, doorways, stepping over an obstacle, change in surface, turning, backwards walking and approaching a destination such as a chair.

Start with a wide hallway, wide doorway, low/small floor obstacle and work your way to a narrow hallway, narrow doorway, large/tall floor obstacle. When approaching a destination, perform a wide turn rather than turning on the spot. Practice side stepping and backwards walking in narrow spaces.

You can dual-tasking to these as well.

# Agility/obstacle courses for the body and mind

You can also add in number of steps to complicate the instructions further e.g. ‘right 3 steps’ meaning step to the left 3 times.

Same can be applied to boxing drills or other physical tasks.

Provide conflicting stimuli: multidirectional walking cued by someone saying ‘forward’, ‘backward’, ‘right’, ‘left’, except opposite to what the person is actually saying. I.e. ‘forward’ means backward stepping, ‘right’ means stepping to the left.

# Cueing

**VISUAL**
- LINES ON THE FLOOR
- LASER ON WALKER/CANE
- STEP OVER A THRESHOLD

**AUDITORY**
- METRONOME/MUSIC
- 1, 2, 3....GO!
- RIGHT, LEFT, RIGHT, LEFT

**TACTILE**
- TOUCH THE LEG TO INITIATE STEP FORWARD
- EXTERNAL TACTILE CUE

**IMAGERY**

E.G. PALM TREES SWAYING IN THE WIND TO TURN, STOMPING THROUGH TALL GRASS ETC.

**OTHER STRATEGIES**
- CHANGE DIRECTIONS
- SHIFT WEIGHT ON THE SPOT
- MOVE ANOTHER PART OF BODY

# Summary

- Freezing is a common issue that may lead to falls
- Episodes triggered by various motor, cognitive, environmental and emotional factors
- Cueing can help temporarily resolve freezing episode but effects decrease over time
- We can use obstacle/agility courses to train both mind and body and reduce freezing episodes

# Questions?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