External Cueing

Produced by: Parkinson Disease Knowledge Translation Task Force

Fact Sheet

Physical therapists should implement external cueing to reduce motor disease severity and freezing of gait, and to improve gait outcomes in individuals with Parkinson disease.

Types of individuals with PD who would most/least benefit from the intervention

- External cuing may benefit a variety of individuals with PD HY 1-4.

How to perform the intervention

- Cueing training should be performed 20-60 minutes; 2-5x/wk; 3-8 weeks.
- Visual: visual cue aimed to improve motor function
  - Examples: Targeted stepping (stepping on/over targets), lasers to reduce freezing of gait, clock-turning strategy for turning
- Auditory: sound that is frequently delivered before or during movement to initiate or sustain a motor action
  - Rhythmic auditory stimulation: pulsed rhythmic or musical stimulation that aims to improve movement patterns by synching movement with a rhythmic auditory beat.
  - Examples: use of a metronome, rhythmic music-based sounds set to a selected beats per minute based on the patient's cadence, choral singing, voice exercises, and counting.
- Amplitude Training: high velocity, high amplitude movement training
  - Amplitude training can be performed as part of a training program (i.e. LSVT BIG; PWR Training) or as independent exercises
- Somatosensory: stimuli aimed to heighten afferent input
  - Vibration

What does it improve?

Type of Cueing	What does cueing improve?	Tools for Assessment
Visual	Motor disease severity, gait speed, stride length, cadence, freezing of gait, Level of physical activity	UPDRS III, 10MWT, Freezing Of Gait Questionnaire (FOG-Q)
Auditory (Rhythmic auditory stimuli (RAS), musical, verbal, counting)	Level of physical activity, gait speed, balance, freezing of gait	Activity monitor; 20-meter walk test, 10MWT, Mini-BESTest. Freezing Of Gait Questionnaire (FOG-Q), FGA

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Type of Cueing	**What does cueing improve?**	**Tools for Assessment**
Amplitude	PD motor symptoms, gait speed, functional mobility	UPDRS III; 10MWT; TUG
Somatosensory	Level of physical activity Spatiotemporal and kinematic gait metrics such as gait velocity and step length	Activity monitor

Considerations for implementation and progression

- No one specific external cueing strategy has demonstrated superiority over another. Therapists and patients can collaborate to select the most salient cueing strategy that meets the patient's needs.
- The implementation of external cueing training, when implemented as recommended above, may be easily adapted to progress an individual with PD and reduce decline in functional outcomes.
- The use of adapting equipment and external tools (i.e. treadmill, auditory cueing, etc.) allows therapists to adjust progression for cuing training. For example, reducing the amount of auditory and external cues overtime to mimic everyday community mobility salient to the individual's needs.
- Continuous auditory or visual cues may be more appropriate in patients with cognitive and visual-spatial impairments.
- Retention of benefits from cueing has not been established. Some individuals may need continued cueing training to maintain benefit.
- Throughout movement performance, individuals can focus their attention internally (focused on a body part or position) or externally (focused on an object external to the body). Several studies indicate that external focus of attention may improve motor performance in PD.
    - Internal focus of attention: "Focus on moving your knee in a slow, controlled manner." "Focus on your feet during the balance activity."
    - External focus of attention: Placing a marker/sticker on the patient's knee; "Focus on moving the blue sticker in a slow, controlled manner." "Focus on keeping the balance pad still."

Considerations for cost, space

- Access to a facility with equipment and trained clinicians for specific external cueing programs is needed for implementation including treadmill training and LSVT BIG.
- External cueing training can be more readily incorporated overground in indoor and outdoor areas with less of a cost and training burden for the clinician and PD individual.

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