APTA Geriatrics | Cognitive and Mental Health SIG

Cognitive Training

What is Cognitive Training?

Any challenge that involves mental, visual, auditory, verbal, kinesthetic, etc. that occupies someone's cognitive attention in some capacity while simultaneously performing a physical task or exercise can be considered cognitive training. In physical therapy we see this implemented as dual tasking, surface variation, adding constraints, games, added elements, added unpredictability, controlled chaos. In the real-world environment, almost all of our ADLs revolve around external stimulus or decision making that require our cognitive attention while we are performing a physical task. Cognitive elements are important to incorporate into our physical task training, when appropriate, to make our treatments more pragmatic.

Mental Capacity and Mental Fatigue

Before implementation of of cognitive training, it is important to know the background and mechanisms of the intervention. Each patient is going to have a differing mental capacity that is of the utmost importance to keep in mind during treatment. Just like each of us, we have differing mental capacities for activity/learning that change depending on our sleep, stress, fatigue, diet, etc. When a certain activity exceeds our mental capacity, we result what is called "task shedding" which is the decline in performance of one or more tasks. Just like in strength training, we want to find activities that properly challenge our current capacity without being too simple or too rigorous. Patients can have mental fatigue following prolonged exertion of their mental capacity which, just like muscle fatigue, is not necessarily a negative as long as it is an appropriate level.

What is the utility?

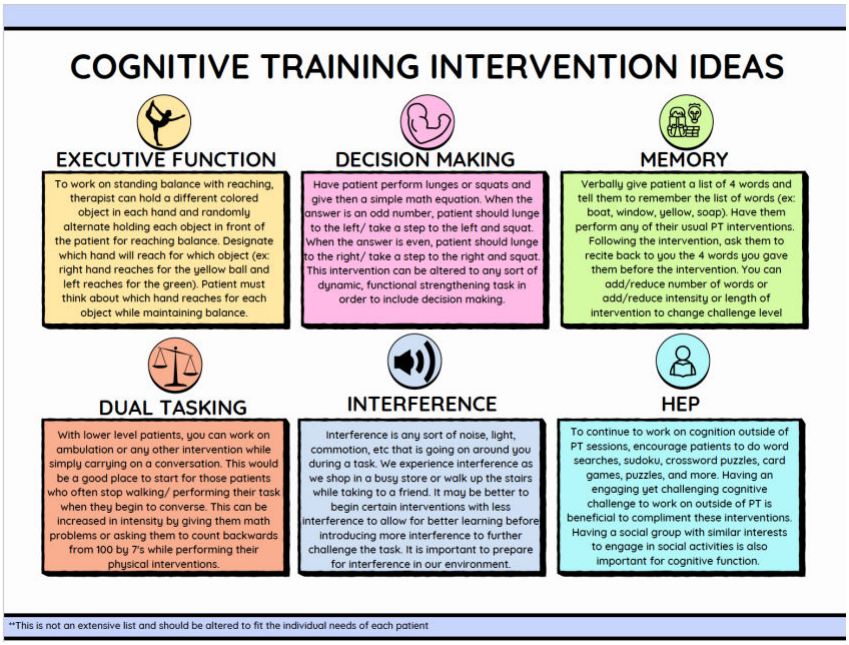
As we age, we rely more heavily on our shallower cognitive resources for completion of motor tasks. We often see task shedding occur when we ask our older adults to dual task due to the task surpassing the cognitive threshold. In fact, research showed more prefrontal cortex activity during dual task walking compared to single task walking providing evidence for needs of additional cognitive resources for more complex gait activities. So the question is, can implementing cognitive training with older adults in physical therapy improve function?

What does the research say?

Research shows that a decrease in falls and an increase in gait speed have been seen using PT in conjunction with cognitive training. Executive function training is shown to improve memory, attention, reaction time, and agility. Cardiorespiratory fitness is shown to improve dual task walking performance.

Gross motor training, or coordination training, has shown large transfer effects by improving executive function and processing speed as well as decreasing prefrontal activity. This suggests that gait impairments are in part due to altered coordination which increases the amount of energy/ cognitive load required to ambulate efficiently. These are just some of the researched benefits of cognitive training in conjunction with PT.

Ideas for interventions!



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