

Measuring Cognitive-Motor Interference: Dual Task Cost

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Measuring Dual tasking

- Why do we measure dual tasking?
- How do we measure dual task capabilities?
- What is dual task cost (DTC)?
- What can we do with this information?

Measuring Dual tasking

- Why do we measure dual tasking?

Measuring Dual tasking

How do we measure dual task capabilities?

- Perform and measure the physical task in isolation
- Perform and measure the cognitive task in isolation
Adjust the difficulty of the cognitive task here as needed
- Measure performance in the combined tasks
You may measure the physical performance, cognitive, or both

*Most typically the patient/subject is not queued to prioritize any one task

Measuring Dual tasking

- What is dual task cost (DTC)?
- The percentage of loss/degradation in performance that comes from being distracted
- Performance can be physical, cognitive, or both

Measuring Dual tasking

What can we do with this information?

- Improve patient awareness
- Create action plans
- Establish a baseline from which to improve

Single task physical

What can we do with this information?

- Baseline for return measurement after distractions are “lifted”

Single task cognitive

What can we do with this information?

- Identify appropriate level of challenge/load
- Identify initial baseline return measurement after distractions are “lifted”

Dual task

What can we do with this information?

- Identify who needs more work on DT
- Create baseline return measurement after training
- Screen for early disease presence

Calculation of Dual Task Cost (DTC)

What can we do with this information?

- Document
- Prescribe
- Achieve goal in one mode, focus elsewhere

Dual Task Cost (DTC)

- Norms
- Dosage
- Expectations
 - Improves in either single task capacity
 - Improves in dual task cost

8	Feb	1	10
<u>9</u>	Aug	4	Apr
12	7	5	3
Jul	2	Sep	Oct
Dec	<u>6</u>	Mar	May
Jun	Nov	Jan	11

Are You Ready for This?



Calculation of Dual Task Cost (DTC)

$$\frac{\text{Single task} - \text{Dual task}}{\text{Single task}} \times 100 = \text{DTCost}$$

Example: 12 second – 16 second = -4sec

$$\frac{12 - 16 \text{ sec}}{12 \text{ sec}} \times 100 = 33\%$$

Calculation of Dual Task Cost (DTC)

$$\frac{\text{Single task} - \text{Dual task}}{\text{Single task}} \times 100 = \text{DTCost}$$

Example: 9 answers – 8 answers = + 1

$$\frac{9 - 8 \text{ answers}}{9 \text{ answers}} \times 100 = 11\%$$

Calculation of Dual Task Cost (DTC)

$$\frac{\text{Single task} - \text{Dual task}}{\text{Single task}} \times 100 = \text{DTCost}$$

Example: 92 seconds – 132 seconds = 40sec

$$\frac{40\text{sec}}{92 \text{ sec}} \times 100 = 43\%$$

1	2	3	4
Blue	Green	Purple	Green
Green	Red	Blue	Red
Red	Blue	Green	Purple
Purple	Green	Red	Blue
Red	Purple	Blue	Green
Green	Red	Purple	Blue
Blue	Purple	Green	Red
Purple	Green	Red	Purple
Red	Blue	Purple	Green
Blue	Purple	Blue	Red
Purple	Red	Green	Blue
Green	Blue	Red	Purple

A

1	2	3	4
Purple	Green	Red	Blue
Blue	Red	Green	Green
Green	Blue	Purple	Red
Red	Green	Blue	Purple
Blue	Purple	Green	Red
Purple	Red	Blue	Green
Green	Purple	Red	Blue
Red	Green	Purple	Purple
Purple	Blue	Green	Red
Blue	Purple	Red	Blue
Green	Red	Blue	Purple
Red	Blue	Purple	Green

B

Are You Ready for...This!?!



Sentence Inhibition Activity

- *Instructions: Have participants verbally state a word that is different than the typical response, after you verbally state the first part of the sentence.*
- *The captain will go down with the _____*
- *Don't judge a _____ by it's cover*
- *The early _____ gets the worm*
- *Beauty is in the eye of the _____*

Sentence Inhibition Activity



Up Next

- Next, we will discuss ***Practical Intervention Strategies and Dosage in Brain Fitness***