



**NEURO**  
INSTITUTE

Continuing Education for Rehabilitation Professionals



## Functional Approaches to Managing Memory and Cognitive Deficits in Individuals with Traumatic Brain Injury

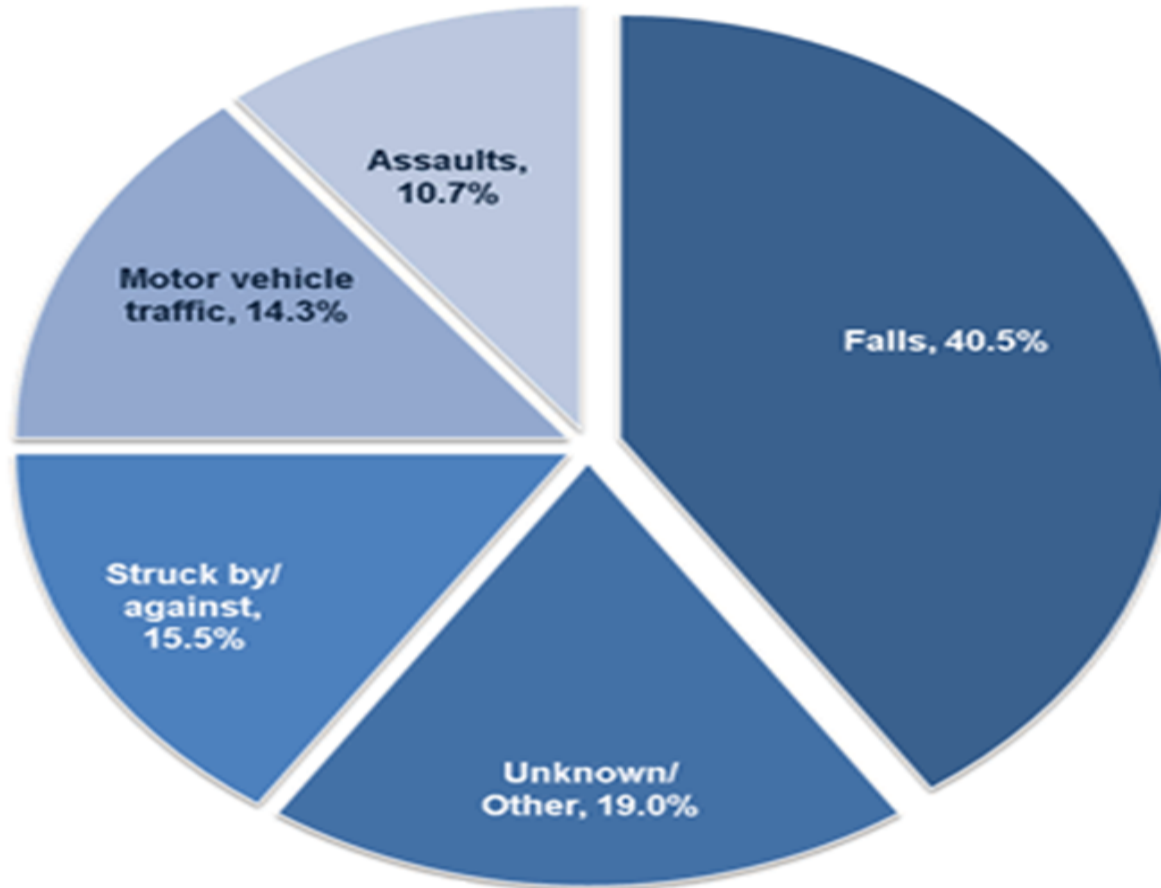
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## Objectives

- In this course, participants will...
  1. Understand what is cognition
  2. Understand how deficits “look”
  3. Learn strategies to improve and compensate for deficits.

## Incidence of TBI – CDC data 2015

**Leading Causes of TBI**



## Incidence of TBI

- ▶ Falls are the most common cause for TBI in both 0–14 age range, and again in 65 plus age range. Falls are the leading cause of TBI death in the 65 plus range.
- ▶ Blunt trauma is the second leading cause of TBI
- ▶ In all age ranges, motor vehicle accidents were the 3<sup>rd</sup> leading cause of TBI. MVAs are the leading cause of TBI death in 0–24 years of age range.

## Incidence of TBI

- ▶ There are approximately 50 million people in the United States living with TBI disability currently.
- ▶ Highest risk for TBI
  - Being a male
  - Age – young and old at highest risk, then 18–45 age range (particularly males).

## Problems after a TBI

- ▶ Motor
- ▶ Cognitive
- ▶ Communication
- ▶ Psychosocial

## What is cognition?

- ▶ Attention and concentration
- ▶ Processing and understanding information
- ▶ Memory
- ▶ Communication
- ▶ Planning, organizing, and assembling
- ▶ Reasoning, judgement, problem-solving, and decision making.
- ▶ Controlling impulses and emotions

## What is cognition?

### ▶ MEMORY

- Sensory Memory
- Short Term Memory (Working Memory)
- Long Term Memory
  - Explicit and Implicit
  - Declarative and Procedural
  - Episodic and Semantic



**What does it look like to have  
problems in these areas?**

## Attention and Concentration Problems

- ▶ Paying attention and focusing on a task
- ▶ Finishing a project – from simple such as taking a shower to complex such as completing a task required for work.
- ▶ Sitting still, carrying on conversation
- ▶ Tolerating being in the community in a noisy or hectic environment such as a restaurant or mall.

- ▶ Taking a longer time to grasp what others are saying
- ▶ Taking more time to understand and follow directions
- ▶ Have trouble following the plot of television shows or movies
- ▶ Taking longer to read and understand information such as a newspaper or book
- ▶ Slower to complete even routine tasks such as getting dressed or cooking a meal.

## Language and Communication Problems

- ▶ Difficulty thinking of the correct word
- ▶ Trouble starting, following, understanding conversation
- ▶ Difficulty staying on topic
- ▶ Difficulty expressing thoughts in an organized manner
- ▶ Difficulty communicating thoughts and feelings using facial expressions and tone of voice
- ▶ Having trouble reading others thoughts and feelings
- ▶ Misunderstanding jokes and sarcasm – being very “black and white”

## Problems Learning and Remembering New Information

- ▶ Related to memory deficits
- ▶ Difficulty with learning new routines and systems
- ▶ May remember some parts of events or conversations, but may appear to confabulate parts to “fill in the gap”

## Planning and Organization Problems

- ▶ Difficulty planning schedules and following them
- ▶ Trouble with things requiring multiple steps from simple to complex tasks.
- ▶ May lose or misplace items frequently, blame others for moving items or taking from them.

## Problems with Reasoning, Problem Solving, and Judgment

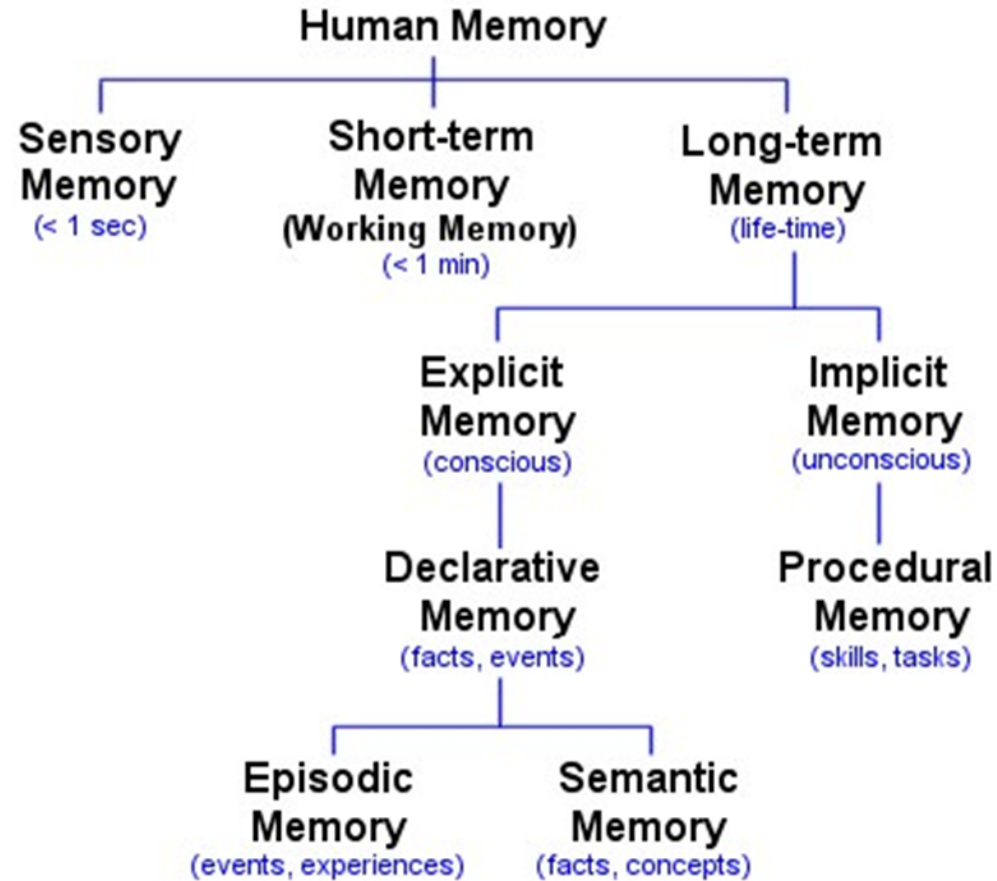
- ▶ Difficulty realizing there is even a problem to start with....
- ▶ Rigid thinking – trouble analyzing options and solutions or changing the way they think
- ▶ Quick judgments
- ▶ Acting without thinking about the consequences

## Inappropriate, Embarrassing, or Impulsive Behavior

- ▶ Denying cognitive problems
- ▶ Saying hurtful or insensitive things
- ▶ Cursing or acting “out of character” compared to pre-injury self
- ▶ Lacking awareness of social boundaries
  - Sexually inappropriate
  - Invading personal space
  - Oversharing information with “strangers”



Memory - <http://www.human-memory.net/types.html>



## Memory after TBI

- ▶ **Most common deficit with memory**
  - Short Term
  - Declarative Memory
  - Prospective Memory

## Process of Storing Memory

- ▶ Attention
- ▶ Encoding Information
  - Being able to “understand” the information
- ▶ Storage
  - Moving information to a specific area of the brain
- ▶ Retrieval
  - Searching the “files” and pulling out a memory

## Process of Storing Memory

- ▶ Memory failure can be attributed to breakdown of one of these processes, which is frequently occurs after any degree of TBI.

So can we “fix” any of these problems, and if so, how????

## Remediation Vs. Compensation

- ▶ Two approaches
  - Fixing the problem – Remediation
  - Coming up with ways to do the things you need to do, in a new way – Compensation
- ▶ Most progress and increase in skills can be seen from combination of the 2 approaches.

- ▶ **Neuroplasticity:** The brain's ability to reorganize itself by forming new neural connections throughout life. Neuroplasticity allows the neurons (nerve cells) in the brain to compensate for injury and disease and to adjust their activities in response to new situations or to changes in their environment.

## Principles of Neuroplasticity

- ▶ **Use it or lose it**
  - Not using functions of your brain can lead to no longer being able to use them
- ▶ **Use it and improve it**
  - Training a specific brain function can lead to an improvement in that function
- ▶ **Specificity**
  - The nature of the training dictates the nature of the plasticity
- ▶ **Repetition Matters**
  - Induction of plasticity requires sufficient repetition



## Principles of Neuroplasticity

- ▶ **Intensity matters**
  - Induction of plasticity requires sufficient training intensity
- ▶ **Time matters**
  - Different forms of plasticity occur at different times during the training
- ▶ **Salience matters**
  - The training experience must be sufficiently salient to induce plasticity
- ▶ **Age matters**
  - Training induced plasticity occurs more readily in young brains

### ▶ Transference

- Plasticity in response to one's training experience can enhance the acquisition of similar behaviors

### ▶ Interference

- Plasticity in response to one experience can interfere with the acquisition of other behaviors.

- ▶ **Metamemory**, a type of metacognition, is both the introspective knowledge of one's own memory capabilities (and strategies that can aid memory) and the processes involved in memory self-monitoring. This self-awareness of memory has important implications for how people learn and use memories.
- ▶ It was long thought that explicit memory was required for metamemory, but in the 20 years it has been seen that implicit memory plays quite a role in metamemory.

- ▶ Individualize the educational information provided about the client's specific memory and cognitive difficulties
- ▶ Involve the client in setting specific goals and selecting memory aids
- ▶ Create opportunities for accurate self-monitoring
  - Providing a delay between a prediction for a memory task, allows cueing for memory aid, thus giving self-monitoring and self-control an explicit connection

## Treatment

- ▶ Anosagnosia
  - Lack of awareness into deficits
  
- ▶ Anosagnosia is one of the biggest challenges in success with individuals with a TBI.
  - Provide “safe” opportunities for failure
    - Example would be allowing the person to make a meal “their way” and it not turn out – burnt toast, runny brownies, yucky coffee
  - Breakdown and discuss task failures immediately after they occur – provide specific feedback.

## Treatment

- ▶ Drill and Practice
- ▶ Dual Task Training
- ▶ Errorless learning
- ▶ Role playing
- ▶ Situational coaching

## Compensatory Training

- ▶ **Internal Memory Aids**
  - Visual imagery
  - Category grouping
  - Mnemonics
  - Rehearsal strategies
- ▶ **External Memory Aids**
  - Written planning systems (calendar, notebook, planner appointment book)
  - Electronic planners (PDA, Blackberry, notepad on cellphone)
  - Computer based planning (Outlook, Google calendar) that links between devices

### ▶ External Memory Aids

- Items that can be task specific
  - Lists to check off and complete ADLS – showering, doing laundry, grocery list
  - Post It notes (can easily get overwhelming without a “system”)
  - Pill organizer
  - Key finder
  - Dry erase board/bulletin board
  - Television Assisted Prompting (TAP)
  - NeuroPage system



## Compensatory Training

- ▶ Establishing both internal and external SUCCESSFUL memory aids requires them to be individualized to the client and re-evaluated as needed to modify and advance the complexity
  - Start at level of establishing orientation
  - Advance to higher level tasks – cautious to establish success at each level

- ▶ Minimize distractions – work in a quiet room
- ▶ Focus on one activity at a time
- ▶ Take a break when you feel tired
- ▶ Allow extra time to complete tasks
- ▶ Re-read and discuss new information , try to put it in “your own words”
- ▶ Try not to talk down to the person having difficulties, use a calm voice, and kind words
- ▶ Do not speak too fast or say too much at once

- ▶ Put together a structured routine of daily tasks and activities – and follow it – as close as possible, including sticking to planned times to eat, practice for therapy, complete basic ADLs, wake up, and go to bed.
- ▶ Set specific locations for keeping things – a place for medication box, a hook to keep keys by door, table for purse/memory book/ items you need to take to therapy or work, keep a notebook next to the telephone for messages /details of conversation

- ▶ Schedule out the whole month – Examples:
  - Grocery on Tuesday
  - Pay bills on 15<sup>th</sup> and 30<sup>th</sup>
  - Dry cleaners every other Monday
  - Therapy M/W/F
- ▶ Use direct deposit and automatic bill pay for as many items as possible
- ▶ Use apps such as GoodBudget to keep track of expenses

## ▶ Social Situations

- Think ahead about situations which might result in poor judgment
- As a caregiver, give supportive and realistic feedback when you observe the inappropriate behavior
- Provide clear expectations before you get there
- Plan and rehears social interactions so they will be predictable and consistent.
- Establish a verbal and non-verbal cueing system

## Final Thoughts....

- ▶ TBI is often a silent problem....you look “FINE”
- ▶ TBI does not just impact the person who suffers it, but the entire family, social, and work network of the survivor.
- ▶ Take it one day, one week, one month at a time.....

## Comments/Questions



Thank you for participating in Today's NeuroInstitute Webinar  
Your Quiz & Evaluation will be sent to you within a couple hours