

Memory Strategies for Educators

Danielle Ploetz, PhD

1

Outline

- Defining memory and brief neuroanatomy primer
- Strategies to consider for helping your students

2

Defining Memory

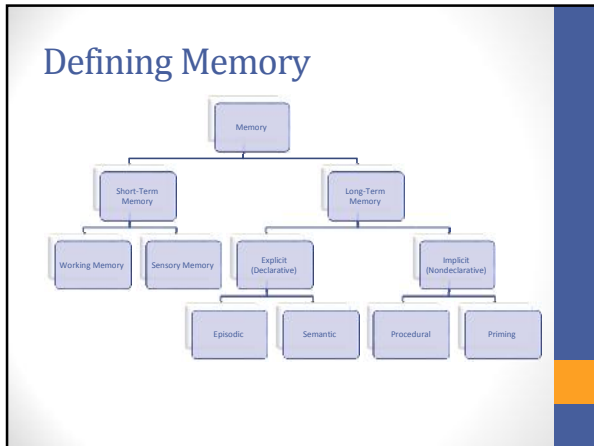
- Memory is the most common and persistent deficit following acquired brain injuries
- Memory is a complex process
 - It can impact past and future recall

```
graph LR; A[Attention] --> B[Encoding]; B --> C[Storage]; C --> D[Retrieval]
```

- Disruption to ANY of these can lead to memory deficits

Haskins, Cicerone, Dams-O'Connor, Eberle, Langenbahn, and Shapiro-Rosenbaum (2012). Cognitive Rehabilitation manual: Translating Evidence-Based Recommendations into practice. Reston, VA: American Congress of Rehabilitation Medicine.

3



4


Neuroanatomy of memory

- Frontal Lobes**
 - Short-term memory (working memory) and Retrieval
- Subcortical region (e.g., hippocampus, amygdala, striatum)**
 - Learning, declarative memory (facts, events)
- Cerebellum, basal ganglia (also subcortical)**
 - Procedural memory for motor learning

5

Memory Problems

- A memory deficit might look like trouble remembering or it might look like.....
 - (Capuco & Freeman-Woolpert)
- She frequently misses appointments-avoidance, irresponsibility.
- He says he'll do something but doesn't get around to it.
- She talks about the same thing or asks the same question over and over-annoying perseveration.
- He invents plausible sounding answers so you won't know he doesn't remember .



6

Translating Research to Practice

The diagram illustrates the components of Evidence-Based Practice. It features three overlapping circles: a green circle labeled 'Best Research Evidence', a blue circle labeled 'Patient Values', and a yellow circle labeled 'Clinical Expertise'. The intersection of all three is labeled 'Evidence-Based Practice'. A hand in a white sleeve is shown drawing the circles with a black marker. Below the diagram, a wooden block has the word 'EVIDENCE' spelled out in white letters, with other letters scattered around it.

7

Considerations

- Severity of impairment
- What needs to be remembered?
Appointment? Facts?
- Preferences, meaning
- Trial and error from clinician

A pair of green sneakers is positioned at the bottom center of the image. Four white arrows point upwards and outwards from the shoes, suggesting a path or direction. The background is a dark, textured surface.

8




Strategies

- Orientation/External Aides
- Errorless learning
- Spaced Retrieval
- Chaining
- Association/Keyword retrieval
- Mnemonics

9

Orientation and Memory

- External Aides
 - Memory Notebook with Calendar
 - Pictures of Staff
 - Memory Log/Individualized Daily Schedule
 - Behavior reward chart/tokens earned
 - Tablets & phones



10

Memory Log/Daily Schedule

Time	Staff/Teacher	Activities
8:00		
8:30		
9:00		
9:30		
10:00		
10:30		
11:00		
11:30		

11

Daily Tasks/Homework

Monday date:	Thursday date:
Tuesday date:	Friday date:
Wednesday date:	Saturday date:
	Sunday date:

12


Errorless Learning

- Cue freely as needed
- Frequent repetition
- Present information in actual context/setting
- Avoid quizzing
- Do not allow guessing or trial-and-error

13

Errorless Learning

- Most basic: make statement & ask student to recall statement without delay
 - My name is Dr. D. What is my name? OR Did I say my name was Sally or Dr. D?
 - You live in Baltimore. Where do you live?
 - This place is called STP. What is it called?



14

Severely Impaired Memory

Orientation

1. Your name is _____. What is your name?
2. You are _____ years old. How old are you?
3. You were born on _____. When were you born?
4. Your phone number is _____. What is your phone number?

Place

1. We are in Baltimore. Which city are we in?
2. You are at STP right now. Where are you?

Injury

1. The date of your injury was _____. When was your injury?
2. You have a _____. What kind of injury do you have?

15

Errorless Learning

- More complex: simple command with conditional clause attached, indicating when command should be executed
 - When you pick up the phone, say, "Hello, my name is Kevin." What should you say when you pick up the phone?
 - Before you sit down, feel for the back of the chair. What should you do before you sit down?



16

Spaced Retrieval

- Identical to errorless learning except student is asked to retain information for progressively longer periods of time
 - Give name and ask to repeat after increasing intervals
 - E.g., 15 sec, 30 sec, 45 sec
 - Duration only increases based on performance and until each prior level is mastered

17

Chaining

- Used to retrain students to perform sequence of steps by procedural memory
- Each item learned automatically, as an isolated unit
- Then mechanically linked with items before and after
- Completion of 1 step in sequence serves to reinforce step that came before it

18

Chaining

- Verbal or visual; helpful to also incorporate motor movements
- Forward
 - Teacher provides 1st step; guides student
 - Once able, 2nd step introduced; student guided to perform both together
 - Once successful, 3rd step introduced; student guided to perform all 3 together
 - Continues until all steps are complete
- Backward
 - Identical, cueing for steps reversed last to first
 - Vanishing cues
 - process for teaching new information in which prompts are provided and then gradually removed

19

Association

- Paired Associate (PA) learning
 - 2 items (a Stimulus and Response item) paired as stimuli (e.g., CALENDAR-SHOE)
 - When items pairs are committed to memory, presentation of first word (the stimulus word) should evoke the second word (the response word)
 - Presenting CALENDAR should elicit a response of SHOE

20

Keyword Method

- Paired-associate learning
 - mediating word ("key" word) is used to associate two items
 - Often used to learn foreign language
 - English word that sounds like some part of foreign
 - Spanish *carta* sounds like the English *cart*
 - *cart* is the **keyword**
 - link keyword with English meaning of foreign word by forming an interactive image
 - *carta* means *letter*, so visualize a letter inside a cart



21

Mnemonics

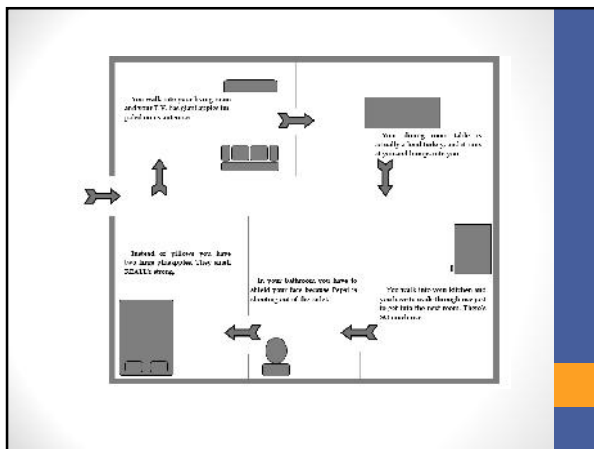
- Acronym-list of initial letters of critical words
 - representing the Great Lakes as HOMES
- Narrative Story Method
 - create story that contains all words in a to-be-remembered list
- Rhymes and Alliterations
- Chunking (phone numbers are great examples of chunking)
- Method of Loci

22

Mnemonics

- Imagery Mnemonic: The Method of Loci
 - Ascertain student recalls a familiar place
 - house
 - Think of different landmarks
 - bathroom, kitchen, hall
 - Train students to "go around" landmarks in particular order
 - Best for simple words lists, like vocab
 - Imagine items in certain places of house

23



24

Circling Back - Summary



- Gather as much information as possible about the child – Neuropsychology evaluations, speech and language evaluations, medical documents, PT and OT evaluations
- These challenges are dynamic, multi-variate, and evolving
- Brain injuries are individual and diverse
 - There are some commonalities but each one is unique
- It is important to individualize and fade accommodations as necessary

25

Summary

- It is important to individualize and fade accommodations as necessary
- As most are aware, the Universal Design for Learning (UDL) provides a framework
 - Under the engagement guideline you can find options related to supporting different areas of functioning
 - <http://udlguidelines.cast.org/>
- Teachers play a key role!



26

APPS to consider

- To name a few...
- Evernote
- Pictello
- iProcrastinate
- inClass
- Index Card
- Google Calendar
- Flashcards Deluxe



27
