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Evidence-Based Interventions for  
Dementia: An Overview of Spaced  
Retrieval & Montessori

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**Evidence-Based Interventions for  
Dementia:**  
An Overview of Spaced Retrieval &  
Montessori

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Kent State University

Presented for [www.speechpathology.com](http://www.speechpathology.com)

**Course Objectives**

- As a result of this course, participants will be able to:
- 1) Define the Spaced Retrieval technique.
- 2) Define Montessori-Based Dementia Programming
- 3) Provide 2 goal examples that use each treatment methods as a focus in working with persons with dementia.

## **Disclosure**

- The presenter is the co-author of the book, “Here’s How to Treat Dementia” (2013; Plural Publishing) for which she receives royalties.

## **Acknowledgements**

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  - Menorah Park Center for Senior Living/Myers Research Institute, Beachwood, OH
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  - Hearthstone Alzheimer’s Care,
  - Northern Speech Services
  - National Institute on Aging
  - Retirement Research Foundation

## Dementia Review

- Dementia is not a specific disease
- Dementia is a descriptive term for a collection of symptoms that can be caused by a number of disorders that affect the brain.
- Alzheimer's disease accounts for 60 to 80 percent of cases. Vascular dementia, which occurs after a stroke is the second most common dementia type.

\* Alzheimer's Association 2017 (1)

## Research Tells Us...

- Dementia is the loss of mental functions involving thinking, memory, reasoning, and language to such an extent that it interferes with a person's daily living.
- Dementia is a group of symptoms that can include:
  - **Language disturbances** (e.g., aphasia, dysphasia, anomia)
  - **Problematic behaviors** (e.g., repetitive questioning, wandering)
  - **Difficulties with activities of daily living** (e.g., dressing, personal grooming)
  - **Personality disorders** (e.g., disengagement, aggressive behaviors)

\* Alzheimer's Association, 2017 (1)

## Memory

- ◆ Memory is dependent on organizing incoming information (attention) and highly developed encoding skills
- ◆ Memory is critical to our ability to acquire language, develop high level thinking, and effectively make decisions

## Memory Stages

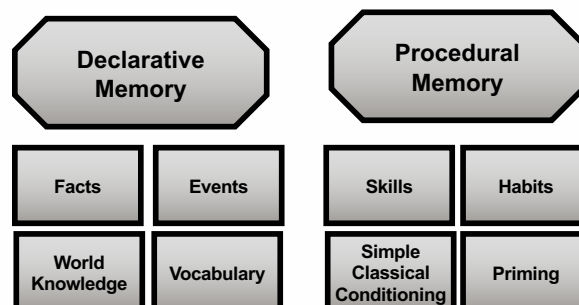
- ◆ Encoding, Storage and Retrieval are interactive processes
- ◆ The ability of one process affects the quality of another
  - ◆ Good encoding makes for good retrieval later on
- ◆ Deficit in one stage can lead to a deficit in another

## Memory Definitions

- Working Memory, Short Term Memory:
  - Ability to use information as it's being processed (remembering phone number)
  - Primarily affected first with Alzheimer's and other dementias
- Long Term Memory:
  - Information from short term memory that is retained permanently
  - Declarative and Procedural Memory
  - Long Term Memory can be affected by dementia in both storing information and retrieving it.

## Learning & Memory in Dementia: Model of Memory

(Squire, 1994)





## Circumvent the Deficits

- Persons with dementia do have weaknesses in the areas of learning and memory **BUT** a number of strengths exist as well.
  - Ability to learn procedures
  - Ability to read
- Research has shown that the learning of information and its retention depends heavily on how it is presented.
  - **KEY: Be aware of the weaknesses but FOCUS ON THE STRENGTHS!!!**

## Mistaken Beliefs About Dementia

- Individuals with dementia cannot learn or remember information
- Best way to care for persons with dementia is to make them comfortable, accept their idiosyncrasies, and be patient with them

## **Behavioral Interventions for Dementia**

- Can be Direct or Indirect
- Direct
  - When a SLP or other professional intervenes directly with individuals or group using an intervention
- Indirect
  - SLP or other professional trains caregivers in an intervention, modify the environment, or develop activities to maximize function
- Spaced Retrieval and Montessori can be both Direct and Indirect

• Mahendra & Hopper, et. al, 2008

## **The Spaced Retrieval Technique**

## The Spaced Retrieval Technique

- Spaced Retrieval (SR)
  - Technique used to help persons with cognitive impairments recall important information over progressively longer intervals of time.
  - First used to address face-name learning in non-impaired individuals
  - Has been used successfully with patients with Alzheimer's Disease, Traumatic Brain Injury, Parkinson's Disease, and Dementia related to HIV (Bourgeois et. al, 2001; Camp, et. al, 2008; Neundorfer, et. al, 2004; Malone et. al, 2007)
  - Is an effective tool that therapists can use to help clients reach their goals in rehab therapy and is billable and reimbursable.
  - Takes advantage of the procedural memory system and is success-based.

## The Spaced-Retrieval Technique

- ◆ **The goal of SR:**
  - ◆ To enable individuals to remember information for long periods (days, weeks, months, years) so that they can achieve long-term treatment goals.
- ◆ Therapists teach clients strategies that compensate for memory impairments, using procedural memory, including reading and repetitive priming.
- ◆ In addition, SR uses *external aids* to compensate for memory
  - ◆ (Brush & Camp, 1999)

## Why Does Spaced-Retrieval Work?

- It capitalizes on retained components of procedural memory
  - Ability to learn skills/habits
  - Ability to use previously learned habits, such as reading
  - Repetition priming (learning through practice)

• Brush & Camp, 1999

## The Spaced-Retrieval Technique

- ◆ Begin with a prompt question for the target behavior and teach the client to recall the correct answer
- ◆ When retrieval is successful, the interval preceding the next recall test is **increased**.
- ◆ If a recall failure occurs, the participant is told the correct response and asked to repeat it
- ◆ The following interval length returns to the **last interval** at which recall was successful.

## Treatment: Spaced Retrieval

- **Goal:** “Client will independently recall location of daily schedule to complete ADL’s, improve attendance at & participation in meals and engage with peers 90% of trials.”

- **Question:** “Where should you look to find your daily schedule?”

- **Answer:** “Look at my walker”



## Treatment: Spaced Retrieval

- **Trial 1 (0 Seconds):** Client Responds **CORRECTLY**
- **Trial 2 (10 Seconds):** Client Responds **CORRECTLY**
- **Trial 3 (30 Seconds):** Client Responds **CORRECTLY**
- **Trial 4 (1 Minute):** Client Responds **INCORRECTLY**
- *Therapist provides client with correct response (“Look at my walker”), asks the client the prompt question again, allows the client to respond, and returns to the interval at which the client was last successful.*
- **Trial 5 (30 Seconds):** Client Responds **CORRECTLY**
- **Trial 5 (1 Minute):** Client Responds **CORRECTLY**
- **Client continues session; Therapist then probes through other therapy activities to continue training/practice of desired skill.**

## Challenging Behaviors with SR Solutions: Prompt Question/Answer Examples

- Disorientation
  - “Where do you live?” (Answer: Name of Facility)
  - “What is your room number?” (Answer: Room #)
  - “What is your address?” (Answer: Client’s address)
- Repetitive Questioning
  - Dependent upon question being asked

## Challenging Behaviors with SR Solutions: Prompt Question/Answer Examples

- **Naming**

- *"If you don't know the name of something, what should you do?" (Answer: "Describe It")*
- *What is your husband/wife/son's name? (Answer: Target name)*
- *Who runs the activities here? (Answer: Staff member's name)*

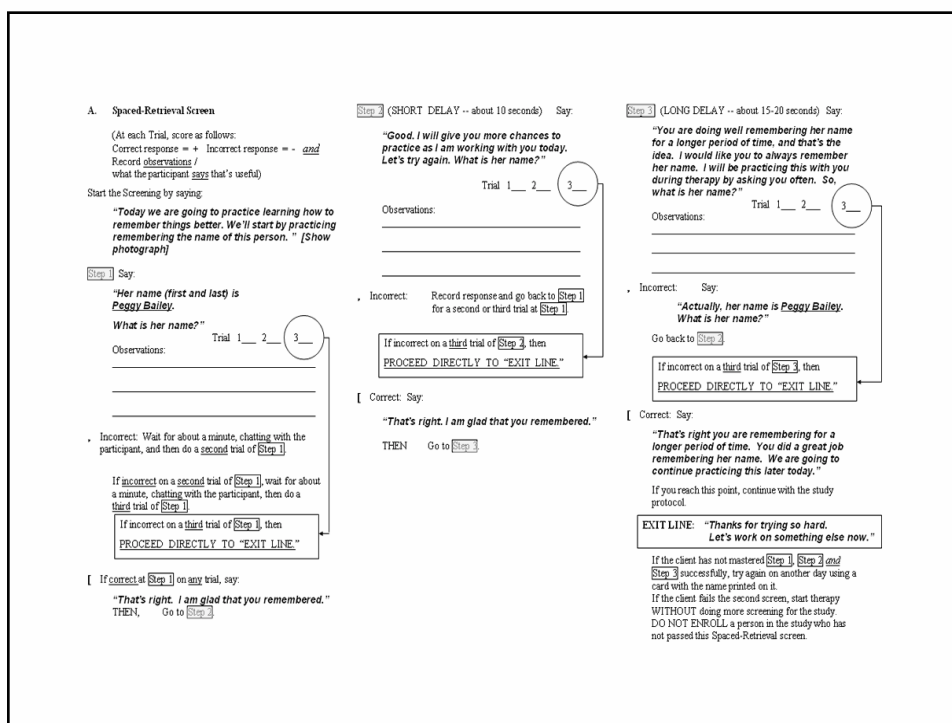
- **Disengagement**

- *What can you read to remind you of your family? (Answer: "Read my memory book")*
- *What can you check to see what is planned for the day? (Answer: "Activity Schedule")*
- *What can you look at to find something to do? (Answer: "My list of activities")*

## SR Screening Measure

- **Complete Screening Process**

- Quick and Easy
- Tests clients' responses to correctly recall a target name over 3 different time intervals (immediately after presentation, 10 seconds later, and 15 to 20 seconds after that)
- Client has 3 trials at each time interval to recall the target name correctly to pass the screen
- **CAN FOLD SR SCREEN INTO INITIAL CLIENT EVALUATION/ADMISSION INTERVIEW**



## What Happens After the First SR Session?

- The therapist begins (**Trial 1** of the next session) by asking the client the prompt question and seeing if the client is immediately able to give the correct response.
  - This provides the client with an opportunity to demonstrate recall since the last treatment session, which may be 24 hours or more.
- If the client recalls the correct answer to the prompt question (and the associated behavior, if applicable) then training on the question can cease for that session.
- If the client cannot recall the correct response, the clinician provides the correct answer, asks the client the prompt question again, allows the client to respond to demonstrate immediate recall and then training should resume, returning to the last time interval the client correctly recalled the response to in the previous session.



## What Happens After the First SR Session?

- Subsequent session example:
- At start of any session following the initial training session on a prompt question/response, the clinician should allow the client to demonstrate recall of the information by asking the prompt question.
- Prompt ? : “How should your legs be when we you sit?”/Response: Uncrossed.
- Trial 1: ”How should your legs be when you sit?”
- **Response Correct:** Reinforce action & discontinue training for remainder of session (may choose to “spot check” retention of response throughout but formal timing of trials not necessary)
- **Response Incorrect:** Say, “Actually, it’s Uncrossed. (*provide correct response*); “How should your legs be when you sit?” (*ask prompt question again*). Client responds “Uncrossed.” Good, when you sit your legs should be uncrossed. Let’s keep practicing (*return to last successful time interval attained in previous session (e.g. 8 min)*), continue SR training based on client’s responses.

## When is an SR goal considered mastered?

- ◆ If a client is able to correctly respond to the prompt question and/or perform the targeted strategy at the beginning of **3 consecutive therapy sessions**, the goal is considered mastered.
- ◆ It is important to make sure that the client is *consistently* performing the targeted strategy or response before discharging the goal.

## How much SR training does a client usually need?

- ◆ The amount of training required by a client will vary.
  - ◆ The number of sessions is dependent upon
    - ◆ Level of cognitive impairment of an individual client
    - ◆ Frequency of the sessions
    - ◆ Number of goals are being addressed using SR.

Clients enrolled in more frequent SR treatment sessions (i.e. 5 days week vs. 2 days/week) are likely to attain their goals more quickly.

## Spaced-Retrieval Goals

- ◆ Goal possibilities are endless
- ◆ SR goals are NOT written any differently than other goals.

◆ **FUNCTIONAL GOAL = SR GOAL**

## SR & Documentation

- SR is considered to be a MODALITY or APPROACH that therapists may use to help clients reach their goals.
- SR does not fit one particular diagnosis category
  - Use the ICD 10 Code that corresponds to the goal area you are addressing
  - Addressing a goal related to swallowing, list the code for “Dysphagia”; addressing a challenging behavior may code under “Symbolic Dysfunction”

## SR Decision Making

- ◆ Questions to ask yourself when preparing to begin SR with a client:
  - ◆ What are the challenging behaviors being exhibited?
  - ◆ What are the strengths of the client? What are the weaknesses (physical impairment, vision, etc.)?
  - ◆ What prompt question will be used and is it and the answer meaningful for the client?
  - ◆ What other staff/family members will be involved in the training/carryover?

## Spaced Retrieval Goals

- Measurement of goal attainment can be by percentage (“80% of time”) or by recalling and demonstrating target response for a set number of sessions (3 sessions recommended) depending on the type of goal.
  - “Client will recall and demonstrate the ability to use compensatory swallowing strategy to decrease choking/aspiration risk 80% of trials.”

**OR**

- “Client will recall and demonstrate strategy of locking wheel chair brakes prior to standing to increase safety at the beginning of 3 consecutive therapy sessions using SR”

## SR: An Interdisciplinary Process

- Caregiver/Family Input:
  - Consult with family/caregivers for possible goal ideas = INCREASES BUY IN AND COOPERATION
  - Work on incorporating the family’s personal goals if possible
  - If working on a goal focused on remediating a “challenging behavior” demonstrated by the client, be sure that the behavior and its frequency are documented in the nurse’s notes to illustrate presence of problem and need for rehab service.

**Montessori-Based Programming**

**He who is served is  
limited in his  
independence.**

-Maria Montessori

## Montessori-Based Programming

- Montessori-Based Programming:
  - Programming method that use Montessori educational principles to provide constructive engagement, meaningful activity, and practice of skills to older adults.
  - Uses principles from the Montessori classroom to help older adults maintain independence and learn new skills.
  - Camp and other researchers have documented the use of this programming method with persons with Alzheimer's Disease and have found that it increases overall participation in activities, as well as rates high in staff satisfaction (Camp, 2002; Skrajner, 2007).
  - Therapists can use these methods to address goals in treatment.
  - High levels of staff satisfaction found in using method

## Activity

- According to the Alzheimer's Association (2017), "***Being engaged in meaningful activity allows us to meet some of our most basic needs, such as socialization, a sense of accomplishment, a sense of purpose, play, as well as our need for cognitive and physical stimulation***".
- ***Activity can be anything...from sitting quietly, to participating in a group game like Bingo to self care to having a conversation with someone.***
  - ***WE ARE ALL ACTIVITY PROFESSIONALS!***

## The Importance of Activities

A person's self-identity, self-esteem, and mood can be greatly influenced by the activities in one's life and the success or failure experienced during these activities. This remains true even when one develops cognitive impairments.

## The Importance of Activities

- Activities and participation in them can:
  - Improve relationships between patients and staff
  - Improve marketing and visibility of facility
  - Impact performance on state inspections
  - Reduce presence of challenging behaviors

\* Camp, 1999; Camp et. al, 2006; Joltin, et. al, 2005

## Maria Montessori



(1870-1952)

Italian physician,  
educator & innovator

One of the first female  
physicians in Italy

## Who was Montessori?



Early medical practice focused on  
psychiatry

In 1907, accepted challenge to open a  
childcare center in a poor inner-city area  
(Casa dei Bambini)

Began designing learning materials & an  
environment that fostered children's  
natural desire to learn

American Montessori Society, 2017



## Who was Montessori?

- The Key to a Better Life For Children:
  - Education
  - Active roll in the classroom
  - Proper environment (Children's Houses)

## Montessori-Based Dementia Programming<sup>®</sup>

Method of ***CREATING*** and ***PRESENTING*** activities based upon models of learning and rehabilitation.

Can be applied to individual or group activities

## Montessori-Based Dementia Programming<sup>®</sup>

### GOAL

To create persons who are as independent as possible, able to make choices, and who are treated with respect and dignity.

Montessori schools help ***create and foster*** children to become ***independent*** members of society, have respect for self, others, and the world.

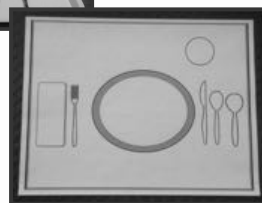
Montessori programming helps older adults ***maintain*** skill in order to ***continue to be as independent*** as possible while respecting the person.

## Key Montessori Principles *Creation*

### Montessori-Based Activities Should:

- Consist of materials that are aesthetically pleasing and are taken from the everyday environment
- Use external cues/templates
- Consist of materials are free of unimportant letters, numbers, words, or markings
- Be placed in a single container or on a single tray
- Be an error-free source of success for people
- Use manipulatives when possible

• Camp, 1999



## Key Montessori Principles *Presentation*

### Montessori-Based Activities Should:

- Have a clear objective that is meaningful to the person
- Begin with an invitation
- Be demonstrated first, at a slow pace with as little vocalization as possible
  - Slow down your movements
  - Match your speed to the person with dementia
- LET GO of idea that an activity has to be done the “right” way
  - Goal is engagement & stimulation
  - Encourage reminiscence
- Be broken down into their component parts and practiced
- Have closure, ending with asking the person if they enjoyed the activity and if they would like to participate in it again sometime

• Camp, 1999; 2005; Jolliffe, 2006

## Case Studies:

### Putting It All Together

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## Case Study

- Case Study
- 82 year-old male; Dementia, CHF, Asthma; Diabetes; Former Musician; Wife is deceased; Family is large and visits often
- Assessment Results: MMSE : 13/30; able to read 48 pt. sized Arial font; Client passed Spaced Retrieval Screen

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## Case Study

- **Client Input:** Client wants to do more “on his own” and doesn’t enjoy being around “all of the sick people”. Feels “bored” and misses his family and old way of life.
- **Staff Input:** Client found napping in other residents’ rooms; often leaves cane in room; tends to take large bites of food when eating, leading to choking; wears cologne, sometimes in “excessive amounts”
- **Family Input:** Satisfied with care; would like a way for their loved one to recall/recognize family members when they visit.

## Case Study

- **Where should we start?**
  - Evaluate assessment results, clients strengths/weaknesses, staff and family input
- **Which areas warrant the most need? Prioritize!**
  - Safety
  - Disorientation
  - Communication; Socialization
- **Which areas are most important to focus on first?**
  - Forgetting cane when walking
  - Taking too large of bites during meals
  - Addressing disorientation to help client locate room

## Case Study

- Always ask the question **“Why is this happening?”** in order to get to the root of the issue.
  - Are repetitive questions being asked because client is seeking information (actual answer to question) or seeking attention?
  - Is the person wandering because they do not know where their room is or because they are seeking social contact, attention, etc.
  - Rehab therapists (OT, SLP's) can target behavioral challenges in treatment as long as the intervention is evidenced-based, functional, and warrants the expertise of the therapist. SLP can also assist in making behavioral intervention recommendations to staff and family to target behaviors

## Case Studies

- Case Study: Behavioral Challenges
  - What are some possible reasons the following behaviors are occurring?
    - Napping in other residents' rooms?
    - Taking too large of bites of food?
    - Forgetting cane?
    - Wearing too much cologne?
  - Also important to analyze: "Who owns the problem?"
    - Is it a legitimate safety or communication issue that needs to be addressed in treatment?
    - Is the "problem" more for staff and family than for the actual resident?

- Safety goals are client's highest priority for treatment
  - Once we understand "why" the client is exhibiting the behavior, we can set a realistic and more effective goal to treat the problem.
    - Swallowing:
      - Problem: Client takes too large of bites
      - Why? Client's tray was taken many times before he was finished, leading him to eat more rapidly
      - Strategy: Teach client to look at visual cue placed near tray that reads "Take your time and enjoy your meal. No one will take your tray until you are done. Take small bites"
      - Use Spaced Retrieval to improve recall of strategy
      - Goal: "Client will recall and demonstrate ability to recall strategy of taking smaller bites during meals 90% of trials using a visual cue."

Take your time and enjoy your meal. No one will take your tray until you are done. Take small bites.

## Case Study

- Remembering Cane
  - Problem: Client is unsafe to walk without cane; high fall risk
  - Why? Client not used to having to use cane to walk safely; does not fully understand why he needs the cane & therefore chooses not to use it
  - Strategy: Educate client on why he needs the cane; write down reasons, biggest being to stay safe and not fall; choose area with client to keep cane so he sees it and remembers it; use Spaced Retrieval technique to teach him to remember the cane; instruct staff to offer LOTS of positive reinforcement when he uses the cane to encourage its use
  - Goal: "Client will recall and demonstrate use of cane to remain safe during walking and decrease fall risk 90% of trials."

## Case Study

- Locating Room
  - Problem: Client is disrupting other residents; becomes disoriented and may end up in unsafe areas
  - Why? Client is napping in other rooms because he cannot locate his own consistently; also enjoys the social contact and attention he receives when does this
  - Strategy: Teach client to look for landmarks to locate room; use meaningful cues (music note on door, since client was a musician); PRACTICE locating room using landmarks starting from different locations on unit; find activities he enjoys and increase involvement to provide social contact & attention.
  - Goal: "Client will learn landmarks in unit environment in order to locate room independently and decrease wandering into unsafe areas 80% of trials."

## Case Study

- Goal must be meaningful to the client
- Activities to meet goal must be interesting, match abilities, and be success-oriented
- Use terminology that the client, staff, and family can understand
  - Example: Ask client what they would call a “Memory Book” before terming it that; Use client response to work on goal, increasing the likelihood they will remember and use it.
- Circumvent deficits
  - Work around areas of weakness
    - Example: Dementia
      - Inattention may lead to client forgetting what they are working on in treatment and why. Remind them throughout session or write down treatment activities so he/she knows what to expect and when they will be finished.

- Case study client: Treatment session focused on remembering to use cane

- Treatment session in client's room since this is where he forgets to take his cane with him
- Begin by stating to client that you are working together to keep him safe by remembering cane.
- Ask client what he calls the cane, May call it a “walking stick”, etc. Use client response to practice goal
- Write down session activities and mark off when you complete each one.

Today:

1. ☒ Review goals: Use cane to keep safe
2. ☐ Decide where to keep cane
3. ☐ Practice remembering to use cane
4. ☐ Work on memory book
5. ☐ Take a walk to lunch with cane



- Goal: Recalling family members' names to increase communication and socialization in visits
- Obtain family pictures and have client assist you in cutting and gluing them to "flash cards" with their names for face/name recognition practice and matching.
- Have family wear name tags when visiting. Use SR to teach client to remember to read name tags.



“Independence is not a static condition; it is a continuous conquest, and in order to reach not only freedom, but also strength, and the perfecting on one’s powers, it is necessary to follow this path of unremitting toil.”

-Maria Montessori (Absorbent Mind, Chapter 8, p. 90)

**Thank you!**

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