The Study of Cognitive Rehabilitation Effectiveness

The SCORE clinical trial is a randomized controlled treatment trial evaluating the effectiveness of cognitive rehabilitation in post-deployment military service members who sustained a concussion.

Chapter 5: Integrated Behavioral Health and Cognitive Rehabilitation Interventions for Persistent Symptoms Following Mild Traumatic Brain Injury (SCORE Arm 4)

Part II: Client Manual for Individual Cognitive Rehabilitation Interventions

Acknowledgements

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Congress established DVBIC in 1992 after the first Gulf War in response to the need to treat service members with TBI. DVBIC's staff serves as the Defense Department's primary TBI subject matter experts. DVBIC is part of the U.S. Military Health System and is the TBI operational component of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE). Learn more about DVBIC at dvbic.dcoe.mil.

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SCORE Disclaimer

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Chapter 5:
Integrated Behavioral Health and Cognitive Rehabilitation Interventions for Persistent Symptoms Following Mild Traumatic Brain Injury (SCORE Arm 4)

Part II
Client Manual for Individual Cognitive Rehabilitation Interventions

Introduction

Enclosed within the covers of this manual is a lot of food for thought about cognitive rehabilitation. This manual will help you understand the central themes of human thought- ranging from maintaining your attention to a task, to organizing your day, to learning new information. The cognitive manual is divided into six major parts, or themes:

1. Goal Setting
2. Sustained and Selective Attention
3. Memory and Learning
4. Planning and Organization
5. Prospective Memory and Assistive Technology
6. Alternating and Divided Attention

You will be exploring these themes in group therapy sessions twice a week and in individual treatment sessions with your clinician 3 days a week. What you will be learning on each day is spelled out in this manual. For example, when you meet with your clinician on the first day of the Sustained and Selective Attention theme, you will be working on understanding what attention is and how to optimize your attention to task.

1: Goal Setting

Session 1: Assessment and Introduction

As you page through this manual, you will notice two tasks that are part of every theme. The first task is Goal Attainment Scaling (GAS) goals.[1] GAS is a proven way to track your progress through this course. Your therapist will train you on managing your GAS goals.

The second task is Attention Processing Training 3 (APT-3), a computer-based learning modality that has been scientifically proven to help increase thinking skills.[2] Your therapist will provide training and support on the use of APT-3 and how to apply the skills you learn to real-life situations.

Homework is a big part of this Study of Cognitive Rehabilitation Effectiveness (SCORE) program. Your fifth grade teacher was correct when he or she said "Practice makes perfect," and sent you with homework to do. Your therapist will explain how to do assigned homework.

Use the following calendars to help track your appointments and organize your day.

Week 1 Time	Monday	Tuesday	Wednesday	Thursday	Friday
0600					
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NOTES					

Week 2 Time	Monday	Tuesday	Wednesday	Thursday	Friday
0600					
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NOTES					

Week 3 Time	Monday	Tuesday	Wednesday	Thursday	Friday
0600					
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NOTES					

Week 4 Time	Monday	Tuesday	Wednesday	Thursday	Friday
0600					
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NOTES					

Week 5 Time	Monday	Tuesday	Wednesday	Thursday	Friday
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NOTES					

Week 6 Time	Monday	Tuesday	Wednesday	Thursday	Friday
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NOTES					

Session 2: Introduction to Goal Attainment Scaling

Goal Attainment Scaling, also known as GAS, is a system or technique used to measure goal achievement and progress toward achieving a goal.[3] It is used to help you reach meaningful functional goals by identifying current and expected levels of performance. In GAS, goals are rated on a continuum from -2 through +2 (see Table 5.1).

Table 5.1. Rating GAS Goals[3]

Number Value	Meaning	Example
+2	Much more than expected level of outcome	My spouse will not have to remind me of an appointment.
+1	Somewhat more than expected level of outcome	My spouse will have to remind me of an appointment less than one time a day (4 or less x a week).
0	Expected level of outcome	My spouse will have to remind me of an appointment one time per day.
-1	Somewhat less than expected level of outcome	My spouse will have to remind me of an appointment more than 1x per day.
-2	Much less than expected level of outcome	My spouse will have to remind me of every appointment.

Where you are now

Steps for developing and implementing Goal Attainment Scaling[1,4]

1. **Identify the goals:** Establish a set of goals to address. When selecting goals, think about using the SMART method. This means that goals should be *Specific, Measurable, Attainable, Realistic and Timely*. You will be able to set up to six goals; we recommend at least three.
2. **Weigh and prioritize the goals**: Look at your goals and weigh them based on importance and difficulty.
3. **Designate a follow-up time period:** Goals will be reviewed at the end of each week. Final assessment of performance towards goals will occur at the end of the six-week program.
4. **Define the expected level of outcome**: The expected outcome is the most probable result you will have after completing this program. It is the level you expect to achieve.
5. **Identify other outcome levels, both desirable and undesirable:** Identify levels in which you exceed your expected goals and achieve a higher performance. You also want to identify goals that are below your expected or desired performance. Level -2 is below your current level of performance.
6. **Assessment and Scoring**: Following each week of treatment, GAS goals will be reviewed and modified if necessary. In addition, new goals will be added if desired. Goals will continue to be tracked throughout the 6 weeks of sessions.

Goal Attainment Scaling examples

+2	I will enter daily tasks into my task list over 90% of the time.
+1	I will enter daily tasks into my task list 75%-89% of the time.
0	I will enter daily tasks into my task list 50-74% of the time.
-1	I will enter daily tasks into my task list 25-49% of the time.
-2	I will enter daily tasks into my task list less than 25% of the time.

Expected Level of Outcome

Baseline (Where you are now)

+2	I will update my "to do" list four times a day and complete >90% of my scheduled weekly tasks.
+1	I will update my "to do" list two times a day and complete 75-90% of my scheduled weekly tasks.
0	I will update my "to do" list one time a day and complete 50-74% of my scheduled weekly tasks.
-1	I will update my "to do" list two times a week and complete 50% of my scheduled weekly tasks.
-2	I will update my "to do" list <two times a week and complete <50% of my scheduled weekly tasks.

Measuring your goals

When measuring goals you may use various quantitative measures. The two previous examples use percentages. Other goals at the expected level of outcome (0) are measured in different ways.

- I will be able to work on a project for 30 minutes before I take a 5-minute break.
- I will read the course materials for 30 minutes before I take a 5-minute break.
- I will require a reminder from my spouse one time per day.
- I will require a reminder from my co-worker one time per day.

STEP 1: Identify the Goals
In the "Identify Your Goals" chart below, begin formulating your goals. Focus on identifying the primary areas you want to address.

STEP 2: Weigh the Goals
In the same chart, weigh your goals by importance by placing a "1" by the most important and then counting down.

	Identify your Goals	**Importance** (1 most important – 6 least important)
❶		
❷		
❸		
❹		
❺		
❻		

STEP 3: Designate a follow-up period
Your follow-up period for your goals will be the last appointment of each week.

STEP 4: Define the expected level of outcome

Now look at the areas you want to address in the table above. Use the GAS tables on the next few pages to identify your expected level of outcome. Your expected level of outcome is where you expect to perform after learning strategies in this program. Place one expected outcome by the 0 (zero) on each GAS form (next six pages).

For instance, suppose you are very busy in the morning and often so distracted you forget to take your morning medication. Currently, your spouse is reminding you to take your medication daily. Your goal is to take the pill daily without your spouse reminding you to do so. We assume that your goal is to remember to take it yourself with no cues or reminders. However, it may not be realistic to believe that you will meet this objective in 6 weeks (remember to be SMART). You could set your expected level of outcome as "I will use a routine to remind me to take my medications 50-74 percent of the time."

STEP 5: Identify other outcomes, both desirable and undesirable
Begin to write your goals in the +1, +2 and -1, -2 areas. Remember -1 is where you are currently functioning and +1 is performing slightly above where you expect to be 6 weeks from now.

Goal Attainment Scaling forms

GOAL # 1	
+2	
+1	
0	
-1	
-2	

GOAL # 2	
+2	
+1	
0	
-1	
-2	

GOAL # 3	
+2	
+1	
0	
-1	
-2	

GOAL # 4	
+2	
+1	
0	
-1	
-2	

GOAL # 5	
+2	
+1	
0	
-1	
-2	

GOAL # 6	
+2	
+1	
0	
-1	
-2	

Attentional exercise

Have you ever heard of an athlete described as 'being in the zone'? This usually refers to a time in the game when the athlete is scoring, running, cycling, jumping or throwing at a phenomenal pace. The athlete is fully immersed in a feeling of energized focus, and all their awareness is channeled toward the task they must complete to win. The athlete is completely engrossed in the task and he or she is able to minimize the effect of any distractions around him or her.

Unfortunately, most of us spend the majority of our time out of the zone. This means we easily get caught up in various distractions of life, such as noises, aches and pains, and busy thoughts, instead of being able to focus on the task at hand. These distractions pull us away from the present task, making it more difficult to accomplish our goals.

The APT-3 training you are about to begin is designed as a very challenging attention exercise. It will help if you are in the zone, or at least approaching the zone, when you start the exercise. This is important, because it will enable you to benefit more from the training.

The task preparation attentional exercises you are about to practice is a way of exercising your attention skills to help you become better able to focus on a present task while redirecting your attention away from distractions. Through these attentional exercises, you can learn to remain aware of the distractions buzzing around you, while still choosing to stay on task. This critical skill not only will help you perform better during your APT-3 training, but also improve your effectiveness in everyday life.

Today's APT-3 training session will begin with a guided attentional exercise called sustained attention - breathing. The exercise consists of an audio recording that will last about 10 minutes. While listening to the recording, you will find a comfortable sitting position, put on your headphones, and close your eyes.

This training increases your ability to manage distractions by teaching you how to actively focus on a particular task. As with any skill, it takes practice, and at times you may notice yourself pulled away by distractions during this exercise. That's ok! With practice, the skills described in this guided exercise will start to come more easily. Even better, you will become better able to approach the zone in the space of a moment, rather than requiring the aid of a 10-minute guided exercise such as this.

Get comfortable, put on your headphones, close your eyes, and begin the exercise. Get into the zone and SCORE a goal for your brain power!

Session 3: APT-3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
Listen for number 1	*Self-talk (repeat target to self)*	*Scanning through emails and looking for a specific date.*	*As you are scanning, say the date aloud over and over. It will be easy to identify when what you see matches what you hear.*

APT-3 Task	Strategies used during the APT-3 exercise	How does this APT-3 activity/task relate to a real life situation?	Identify a strategy you could apply in this real life situation?

APT-3 Strategy Examples

Re-auditorizing
Visualizing
Verbal self cueing
Counting on fingers
Closing eyes
Breathing
Pacing
Body alert
Looking at screen
Working toward a goal
Self-talk
Rewards self
Breathing/relaxation
Clinician encouragement
Repeating instructions
Writing a reminder

Generalization Strategy Examples

Visualization
Verbal self cueing
Self-talk (repetition of task/goal)
Visual cues (post its, leave item in view)
Auditory Cues (alarms, timers)
Take notes
Decrease distractions
Modify Environment
Take breaks
Break task into parts

2: Sustained Attention

Session 1: The Memory System[5-7]

Stages of memory storage

Sensory

- Sensory input that is registered in and relayed to the brain. Lasts only a few seconds and may be incidentally or subconsciously transferred to short-term memory.

Short-term

- Also known as the "crossroads of the memory system." Short-term memory holds and processes information that is received from sensory memory and retrieved from long-term memory. It must hold on to information for approximately 30 seconds before the information can be transferred to long term memory. If information is not utilized, it is forgotten.

Long-term

- Stores information indefinitely. Information stored is generally in an inactive form and remains available for retrieval at another time.

Steps of the memory process

Attention

- The cognitive process of concentrating on one aspect of the environment while ignoring other things.

Encoding

- The initial stage of memory. Encoding is the analysis performed on materials to be remembered.

Storage

- When information is encoded, it is stored in long-term memory.

Consolidation

- Processing that stabilizes a memory trace after initial acquisition (also known as the process of practicing). Often thought of as categorizing and organizing the memories. Repetition helps consolidate.

Retrieval

- Searching for or activating existing memories. Retrieval requires the ability to monitor the accuracy and appropriateness of the memories pulled from storage.

What is attention[8,9]?

Focused attention:

The ability to respond discretely to particular visual, auditory, or tactile stimulation.

Sustained attention:

The ability to sustain a steady response during continuous activity. It is commonly called concentration.

Selective attention:

The ability to maintain attention with distracting or competing stimuli present. These distractions may be either external (noise) or internal (worries).

Alternating attention:

The ability to shift focus between tasks or shift attention from one thing to another.

Divided attention:

The ability to simultaneously respond to multiple tasks or to do more than one activity at a time.

Examples:	
Reading an operational manual	Sustained
Reading emails with the radio on	Sustained & Selective
Answering text messages while listening for basketball scores on the television	Sustained & Alternating
Talking with a friend and listening for your name while waiting to be seated at a restaurant	Sustained & Divided
Talking on the cell phone	Sustained
Talking on the cell phone while watching a football game	Sustained & Selective
Ordering pizza on the phone and asking someone in the room for toppings	Sustained & Alternating
Talking on the cell phone while driving a car (not recommended)	Sustained & Divided

Specialist Smith case study

Specialist Smith was injured in an improvised explosive device (IED) blast to a mine-resistant ambush-protected (MRAP) vehicle 9 months ago, resulting in a concussion and a fracture to the hand. Specialist Smith works in the motor pool and complains his job has become more difficult. He thinks he is spacing out at work. He has difficulty figuring out what to do when asked to do simple things, such as determining when to change the oil in the truck fleet. He forgets to complete vehicle inspections on time. During peak times at work, Specialist Smith frequently mixes up repair orders for different vehicles. He thinks the difficulty is due to answering the office phone, responding to emails and attending to people in the office at the same time.

Specialist Smith has difficulty managing his work schedule around his bi-weekly Occupational Therapy appointments for his hand rehabilitation. He attends approximately one-half of his scheduled appointments. Often, Specialist Smith remembers his appointments 15 minutes after the scheduled start time.

Specialist Smith also frequently misplaces his hat and keys at home. Sometimes he forgets to take his morning and evening medications. He reported no thinking difficulties prior to his injuries in May.

Specialist Smith is married and the father of two children, ages 5 and 2. He and his family reside on post. In the near future, the Smiths want to buy their own home near good schools. Specialist Smith is unsure if he can afford to make this move. He reports limited income and excessive credit card debt. He reports he has lost control of what and to whom he owes since his injuries. He wants to be the family financial manager because his wife is "worse with numbers than I am."

Specialist Smith desires to get an associate degree in criminal justice. He failed a history course 2 months ago. He had difficulty retaining the large amount of information needed to pass the course. He spaced out during the lectures and became easily distracted by many things to include noises outside the classroom windows and thinking about his plans for dinner. He was also distracted when studying at home because his home has an open floor plan, and he could not concentrate while the kids were playing in the living room. When he attempted to study after the kids went to bed, he often ran out of time because he would not begin his assignments until very late at night. Furthermore, Specialist Smith did poorly in school because he had to read the information over and over again to understand it.

Specialist Smith is in charge of getting dinner started, a task he previously enjoyed. He no longer enjoys cooking because he often burns the food, forgetting he has something on the stove. When cooking, he often gets distracted by tasks including answering supervisor's text messages, folding laundry and helping children with homework.

Stop, observe and refocus

During our waking hours, we are bombarded with never-ending thoughts. For example, these thoughts may include insecurity about our financial status, arguments with loved ones, and physical pain. We often cannot control these thoughts and feelings. Our *thinking self* never rests.

However, we *can* control how closely we pay attention to these thoughts. Our *observing self* has the ability to step back from those thoughts and direct our attention instead to more meaningful and important activities.

We must determine which thoughts are helpful and which thoughts are ineffective. So, how do we get our *observing self* to kick our *thinking self* to the curb?

We want to use the **S**TOP**, O**BSERVE **A**ND **R**EFOCUS technique. For instance, you are at a doctor's appointment and your doctor is explaining important test results. All you can think about is the argument you had with your spouse earlier in the day. At this point in time, you have not been able to concentrate on what your doctor said.

> **STOP.** Kick those distracting thoughts to the curb.
>
> **OBSERVE.** Take a deep breath (or two or three).
>
> **REFOCUS.** Make eye contact with your doctor. Become an active listener. Ask your doctor to repeat the information.

Over the course of the next 6 weeks you will undoubtedly encounter challenging mental exercises. You will need all your mental resources to conquer these exercises. You will need to kick your *thinking self* to the curb and refocus on the task at hand, to complete the tough stuff. Your therapist will occasionally cue you to remember the concept of **S**top **O**bserve **A**nd **R**efocus during these tough times.

Optimizing attention: environmental strategies

Reduce external distractions	• Turn off the music or television, or use ear plugs • Minimize visual clutter
Modify your surroundings	• Find a quiet area • Rearrange furniture, close curtains • Ensure adequate lighting • Set desk/chair height to comfortable position at work • Set room temperature on the cool side to help keep you alert
Set alarms	• Set alarms as reminders for pending tasks to decrease the distraction of watching the clock
Modify times	• Use your individual best time, such as morning or afternoon, to focus on a task requiring attention to detail • Allow yourself time when changing tasks • When changing tasks, verbalize what you are currently doing • If you know you will be interrupted, work on a very familiar mundane task
Take breaks	• If you notice you are becoming distracted, take a short break and then return to the task at hand • Use the "High Priority/Low Priority" strategies for organization • Break tasks into smaller steps; mark off on a checklist after each task is completed
Focus on one task	• You may perform inadequately if juggling too many tasks at once
Avoid interruptions	• Use "Do Not Disturb" signs • Gather supplies before starting activity (pen, paper) • Turn off phone ringer
Be an active communication partner	• Ask questions during conversations to ensure clear understanding • Repeat information from conversations (paraphrase)
Improve sleep	• Sleep deprivation causes difficulty with paying attention
Decrease stress	• Internal distracters focus attention away from the task at hand
Exercise	• A healthier body helps your thinking skills
Use of sensory input to increase concentration	• Chew gum • Squeeze stress ball for hand • Tap a pencil or your foot
Use an idea log	• Designate a notebook or use voice recorder on smart phone
White noise	• Background music or fans may help block out surrounding distractions
Set a designated location	• Use the same location to keep key items in one place (cell phone and charging station, wallet, hat and key hangers)
Handling Interruptions	
Sticky notes	• Use sticky notes as place holders for tasks; note where you stopped and what action is pending, what you did last and what you will do next • When reading, use as place markers • Use visual cues: take lunch, grab keys, lock door, take medications
Phone calls	• Allow phone calls to go to voice mail and answer later

Identifying distractions

Fill in the spaces below with tasks you identify as having difficulty completing due to distractions. Indicate possible modifications to help minimize distractions. Add items throughout this week and complete by end of week.

Specialist Smith			
Date	**Task**	**Distractors**	**Possible Modifications**
12/11	Cooking	-Children playing in living room -Laundry	-Quiet activity time for children -Start laundry and set timer to check
12/15	Attending class lecture	-View outside Window -Noises in back of room -Thinking about dinner	-Sit close to speaker -Plan menu ahead
12/19	Completing Work orders	-Interruptions: phone, email, customers	-Turn off email, -Place caller on hold to mark stopping point
Your individual tasks			
Date	**Task**	**Distractors**	**Possible Modifications**

Session 2: APT-3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
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Take notes
Decrease distractions
Modify Environment
Take breaks
Break task into parts

Session 3: Attention Energy Management

Organize your day according to the attention demands of the task at hand and the consequences of performance (see Table 5.2).[10] On average, an individual can maintain his or her attention for approximately 20 minutes and then benefit from at least a 15 to 30 second break.

Things to think about when you have difficulty paying attention include the following:

- Difficulty of the task
- Familiarity of the task
- Enjoyment of the task
- Intensity of the distraction

Table 5.2. Consequences of Tasks

Example	Cognitive demand	Performance factors	Consequence level	Best Time
Folding laundry	Easy	Errors acceptable	Low	Limited ability to pay close attention Pain/physical symptoms manageable Limited control of distractions in environment
Online banking	Difficult	No margin of error	High	Well-rested Most alert Controlled pain/physical symptoms Quiet environment

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Attention energy demands and tasks[10]

Identify your attention energy demands with personal, family, work and household-related tasks	**Consequence level**	**Difficulty level**	**Best time of day**
	High or low	**Tough or easy**	**Time**
Household/family fold laundry	low	easy	evening, watching TV
Household pay bills	high	tough	after kids' bedtime
Work preparing work orders	low	easy	afternoon
Personal studying for test	high	tough	early morning

3: Memory and Learning

Session 1: The Memory System[5-7]

Stages of memory storage

Sensory

- Sensory input that is registered in and relayed to the brain. Lasts only a few seconds and may be incidentally or subconsciously transferred to short-term memory.

Short-term

- Also known as the "crossroads of the memory system." Short-term memory holds and processes information that is received from sensory memory and retrieved from long-term memory. It must hold on to information for approximately 30 seconds before the information can be transferred to long term memory. If information is not utilized, it is forgotten.

Long-term

- Stores information indefinitely. Information stored is generally in an inactive form and remains available for retrieval at another time.

Steps of the memory process

Attention

- The cognitive process of concentrating on one aspect of the environment while ignoring other things.

Encoding

- The initial stage of memory. Encoding is the analysis performed on materials to be remembered.

Storage

- When information is encoded, it is stored in long-term memory.

Consolidation

- Processing that stabilizes a memory trace after initial acquisition (also known as the process of practicing). Often thought of as categorizing and organizing the memories. Repetition helps consolidate.

Retrieval

- Searching for or activating existing memories. Retrieval requires the ability to monitor the accuracy and appropriateness of the memories pulled from storage.

Daily effects of memory and attention difficulties

Common difficulties following concussion and brain injury include remembering information and events that occurred following injury. Typically, memories before the injury are unaffected. Memory and learning difficulties can negatively affect individuals in their personal lives, ability to function at home and the way they perform at work and school.

Common memory difficulties that affect home and personal life include forgetting the following:

- Birthdays and anniversaries
- To pay bills
- Whether you left the stove or iron on
- Where you placed your car keys
- Groceries (e.g., items on list & bags in your car)
- Where you placed various items around your house
- To do daily chores around the house (examples: take out trash, unload the dishwasher)
- Details from conversations

Common memory difficulties that can affect work and school include forgetting the following:

- Appointment and meeting times
- Meeting locations
- People's names
- Telephone numbers
- Details of things you have read
- To pass on a message
- To check your calendar

Many of these difficulties with memory and attention are experienced by the general population. Although you may be experiencing them for the first time or more often than before, some of the strategies you can use to improve your functioning are basic strategies commonly used by others around you. One study[11] revealed some things people with and without mild TBI forget:

"Symptom"	Percentage of people who forget
Forgets telephone numbers	58%
Forgets people's names	48%
Loses car keys	31%
Forgets groceries	28%
Loses items around the house	17%
Forgets content of daily conversations	17%

Internal memory strategies

Internal Memory Strategies		
Internal memory strategies are often used to help you process information in a way that improves your ability to encode, consolidate and retrieve information more easily.		
Strategy	**Definition**	**Examples**
Visual Imagery	Create an image in your mind of something that you want to remember.	Visualize yourself driving when you are listening to directions. Picture yourself turning at the light.
Active observation	Observe and actively pay attention to your environment.	Actively pay attention to your surroundings while driving.
Association	Relate something that is unfamiliar to something with which you are already familiar.	Recall a family member's birthday by relating it to a major holiday, names, places, dates, concepts.
Rehearsal	Repeat information in your mind or aloud to improve encoding.	Repeat something quickly to yourself for immediate recall, such as a phone number. Repeat something over a longer period of time to encode for delayed recall or store in your long-term memory, such as facts from class or someone's names.
First letter cues	Focus on the first letter of a word, name, or phrase to help learn or memorize it. Use the first letter as a cue to retrieve that word.	Mnemonics (Sugar, Tea, Eggs, Milk) spell STEM) (Never Eat Sour Watermelons to remember North, East, South, West). Acronyms (BSEP; Basic Skills and Education Program).
Rhymes (sayings)	Link ideas and facts together by rhyming, developing patterns between words or lyrics.	"i" before "e" except after "c."
Categorizing	Group information into meaningful sets.	Need to remember 6 things to get from the storage shed (2 boxes of baseball equipment, 1 box of ski gear, 2 boxes of study manuals, 1 box of baby toys).
Story method	Develop a story that incorporates all of the things you want to remember.	Kingdom, Phylum, Class, Order, Family, Genus, Species. *I will rule the kingdom. And my people, I will fil' em' (phylum) by class. I will be able to order my family around. I will be the most genius (genus) of our species.*
Chunking	When reciting word or numbers for immediate memory, chunk them into threes or twos.	When memorizing a driver's license number, break up the number into patterns.

Word recall (Part 1)

Use one or more of the internal memory strategies on the previous page to encode or remember the following list of words. Feel free to mark on this paper.

Hammer

Hospital

Rosebud

Gorilla

Hot Dog

Lunch

Anniversary

Skateboard

Racetrack

Tweet

Word recall (Part 2)

Now write list of words below.
How many words were you able to remember?
What strategy/strategies did you use to remember the words?

Metacognitive rating scale[2]

Rate the following regarding this exercise:

How hard did your brain work on that exercise?

0	1	2	3	4	5	6	7	8	9	10
Super Easy					Had to think				Crazy Hard	

How motivated were you to complete that exercise?

0	1	2	3	4	5	6	7	8	9	10
I gave up			I spaced out for some of it			I was pretty focused				I was in the zone

Everyday ways to use internal memory strategies

Visual Imagery	Active observation	Association
Rehearsal	First letter cues	Rhymes (sayings)
Categorizing	Story method	Chunking

Identify the internal memory strategy that was used to improve memory and learning in the following situations.

Mary frequently gets lost. Now, when she gets directions, she asks for landmarks and creates pictures of them in her mind. She stated that it helps her to picture herself turning right past the drugstore, versus turning right at the second stoplight.

Which strategy is she using? _____

Brittany always forgets her friends' birthdays. She currently relies on her cell phone calendar to remember them. However, she has made it a personal goal to recall the dates independently.

Brittany has tried using repetition no success. Now, she is looking at the months and days. She is trying to make correlations to other holidays, events or even particular numbers that stand out. For instance, "Rebecca and Mary's birthdays are both on the 18th. However, one is in January and one is in November."

Which strategy might represent the technique she is using? _____

Dan just opened his own medical practice. He thinks it is very important to remember his patients' full names when he sees them in his office or in the community. Dan originally tried using their name frequently during their first few appointments. Dan said things like, "Have a nice day, Bob" versus just "Okay, have a nice day."

Which strategy is he using? ___ _____

When this strategy does not work, Dan tries to pair the name of the new person with someone he already knows with that name (such as a relative or even a famous person).

Which strategy is he using? __ _____

Zoe has problems remembering information from conversations. Sometimes, she forgets facts she needs to remember. For example, she forgets things her friends might say like, "Meet me at the movie theatre at 3:30 on Saturday so we can get the matinee discount." Zoe forgets general information from conversations. For example, she forgets when a coworker tells her "My daughter just joined gymnastics this year and has been doing really well in competition." Zoe always feels bad when she has to be reminded of these things.

Zoe realizes she can't write down everything, so she has been trying out some new techniques. To remember dates and times from a conversation, she might repeat the important facts aloud ("So, I will meet you at the theatre at 3:30 because that is 30 minutes before the movie starts." or "Oh, so your daughter has been in gymnastics for one year? That's great. How often does she compete?"). Zoe thinks repeating what she had heard is helpful.

Which strategy is she using? _____

Michael is taking a safety course at his job and is nervous about the quiz at the end. There are many rules and steps to remember. He was trying to remember the steps to manipulate a fire extinguisher. Michael kept repeating the steps but they would not "stick." A friend sitting next to him said, "My wife learned a way to remember the steps at her job by using the word PASS (Pull, Aim, Squeeze, Sweep)."

Which strategy is this? _____

Adam is having difficulty remembering how many medications to take each day. He knows which medication is for what; however, Adam just cannot remember the correct doses (1 of this, 2 of that). Therefore, Adam came up with a solution to this problem. His solution is to state in the morning, "2 for pain, 3 for gain," and state at night, "3 for head, 4 for bed."

Which strategy is he using? _____

Erica has a new workout routine at the gym recommended by her Physical Therapist. She tried carrying around a note card with the activities written on it; however, she frequently lost the note card. Erica decided she needed to memorize the list of exercises instead. In the clinic, the exercises are typically written on paper or whiteboards. When Erica is memorizing the exercises, she tries to group them by the area in which she was working, such as "legs, arms" and "biceps, hamstrings." With her new method, Erica is able to complete her workout consistently.

Which strategy is this? _____

Word recall (Part 3)

Now write list of words below again.
How many words were you able to remember?
Which strategy worked better for you?

Metacognitive rating scale

Rate the following regarding this exercise

How hard did your brain work on that exercise?

0	1	2	3	4	5	6	7	8	9	10
Super Easy					Had to think				Crazy Hard	

How motivated were you to complete that exercise?

0	1	2	3	4	5	6	7	8	9	10
I gave up			I spaced out for some of it			I was pretty focused				I was in the zone

Session 2: APT-3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
Listen for number 1	*Self-talk (repeat target to self)*	*Scanning through emails and looking for a specific date.*	*As you are scanning, say the date aloud over and over. It will be easy to identify when what you see matches what you hear.*

APT-3 Task	Strategies used during the APT-3 exercise	How does this APT-3 activity/task relate to a real life situation?	Identify a strategy you could apply in this real life situation?

APT-3 Strategy Examples

Re-auditorizing
Visualizing
Verbal self cueing
Counting on fingers
Closing eyes
Breathing
Pacing
Body alert
Looking at screen
Working toward a goal
Self-talk
Rewards self
Breathing/relaxation
Clinician encouragement
Repeating instruction
Writing a reminder

Generalization Strategy Examples

Visualization
Verbal self cueing
Self-talk (repetition of task/goal)
Visual cues (post its, leave item in view)
Auditory Cues (alarms, timers)
Take notes
Decrease distractions
Modify Environment
Take breaks
Break task into parts

Session 3: Internal Memory Strategies

Practice makes perfect – learning internal memory strategies

When you are unable to write down information, internal memory strategies may come in handy. Present your client with each bit of information or scenario and encourage him/her to apply internal memory strategies to encode the information.

1. Remember these words: car engine keys mirror seatbelt

2. Remember these words: oven remote book scissors radio

3. Listen carefully: "Please go to the office and get me the receipts, calculator, cell phone, and water bottle….Oh, yeah, and my red pen."

4. Listen carefully: Susan decided to run errands on Saturday morning. First, she went to the bakery to get some cranberry walnut bread for Sunday brunch. Then, she went to the post office to mail a birthday present. Finally, she stopped at the mechanic to get her oil changed.

What did Susan do on Saturday?

5. Listen to the following instructions. When I complete presenting the instructions I will tell you to carry them out. Complete your drawing on your answer sheet in the fifth box.

Draw two circles side by side with the one on the left slightly smaller than the one on the right. Divide the big circle in half with a horizontal line. In the top half write your name. Shade in the small circle.

6. Listen carefully: "Hi, this is Samantha calling from Dr. Williams' office. Dr. Williams is out today and would like to reschedule your appointment for next week, Wednesday at 1300. Please let us know if you will be able to attend this appointment."

Who left the message?

For what date and time was your appointment reschedule?

7. Listen carefully: "Hey, David called and said we are moving game night to Mike's house. He lives on Main Street. Take Interstate 10 west until you reach the Hillside exit. Take a right on the first road by the gas station, and his subdivision is on the left. It is called Rolling Hills, and the gate code is 246."

What are the directions to Mike's house?

What is the subdivision name and the gate code?

External cognitive aids to improve memory and learning

	Type of Device	What do you do with the systems?	How can it be used to improve learning ("store, learn, retain")
Taking notes	Notebooks Note cards Paper Smartphone, tablet or computer	→ Take notes during meetings, lectures and conversations → Take notes while reading information to extract key terms and main ideas	Notes typically consist of key parts, and therefore help you break down the amount of information you are trying to learn The act of writing helps you pay attention to the information and helps you retain it
Color coding	Highlighters Colored pens/Pencils Colored "sticky notes" Commercially produced colored tabs	→ Highlight similar types of information in the same color → When placing color coded tabs, have a system for the colors	Our minds will often link information together. Actively color coding information helps your brain organize it as you are trying to learn Many people are visual learners and associate something visual with a word or term
Recorders	Handheld recorders Recorders located on pens Recorders located on smartphones Recorders located on computers	→ Record lectures, meetings and conversations (with permission) → Record yourself reading materials from a manual or textbook	Using recordings allows for easy repetition of materials If you are an auditory learner, allows you to encode the information in an area of strength for you
Other devices and systems	"Smart pens" Digital cameras	→ "Smart pens" are able to track what you are writing → Take pictures of charts in book, diagrams written on board, etc.	Using smart pens allows you to transfer between taking handwritten notes and recording auditory information when necessary Allows you to capture diagrams and notes quickly

Using external strategies

Examples of using external strategies: Which one do you prefer?

EQUIPMENT OPERATION, MAINTENANCE, AND REPAIR MANUAL DEVELOPMENT

SECTION A – Requirements of Manual Construction/Development

A.1 General Requirements

Underline

The contractor should provide four finalized copies of the Equipment Operation, Maintenance, and Repair Manuals. In addition to these comprehensive manuals, two separate manuals for each service should also be submitted (i.e., electrical, plumbing). The manuals should be submitted and approved by the owner 60 days before completion of the project (signified by date facility will be in operation, which includes initial operations by employees of the company or organization). Should manuals be submitted after the 60 day deadline, the contractor will be charged $1,000.00 per day until manuals are received.

A.2 Specific Requirements of the Manuals

Highlight

A.2.1 Equipment is defined as a single piece of equipment operating alone or in conjunction with other equipment to accomplish a system function.

A.2.2 System is a combination of one or more pieces of equipment that function together to accomplish a purpose (i.e., a network system is composed of many pieces of equipment: hard drives, wires, modems, etc.)

-3-ring binder
-no bigger than 4 inches
-width 1 inch longer than width of materials

A.2.3 Binder Specifications
Manuals should be placed in hard cover three-ring binders. Binder width should be one inch larger than the minimal amount required to hold the specified document. Binder width should not be larger than four inches. If a binder would exceed four inches based on the prior specification (one inch more than minimum) then the material should be place in two binders labeled PART 1 and PART 2. Binders should also be labeled with EQUIPMENT OPERATION, MAINTENANCE, AND REPAIR MANUAL on both the spine and the front cover in addition to the contract number.

Materials = 1 in. then
Binder = 2 in.

Take Notes

Label on spine cover

Intentional Reading Form

An Intentional Reading Form may be used to take organized notes while reading.[12] Above each column are suggestions of information you could write. You may print out samples such as this table or just use the concept while writing on regular notebook paper.

Intentional Reading Form	
◆ Important Facts & Information	◆ Questions ◆ Reminds you of… ◆ Diagrams & Charts ◆ Things you need to look up… ◆ Page numbers
Two primary areas of immigration from 1821-1860: - Ireland - German States	Refer to pie chart and graph on page 225.

PQRST & SQ3R[13,14]

PQRST & SQ3R		
PQRST	**P**review—Read through information once to become introduced to it	-Scan the headings or titles -Scan through key or bold words -Read summaries
	Question—Question yourself about what you have read	-Develop questions from the headings or subheadings -Develop questions that you expect to be asked during a test or exam -Use pre-developed questions if available at the beginning or end of the passage
	Read—Reread the passage to find the answers to any questions that you did not quite understand	-As you read, answer the questions -Reflect on what you read -Attempt to associate new information you read to something you already know
	State/**S**ummary—Literally state the answers to those questions	-State the answers to the questions by stating them aloud or writing them
	Test—Reread the passage to check and ensure your answers were correct	-Test yourself to ensure you know the information
SQ3R	**S**urvey- read through your passage to become introduced to it	-Read the title and the introductions -Review the main headings and summaries, if available
	Question – question yourself about what you have read	-Turn each subheading into a question -Write the questions down "questions make you more active while you read, you are looking for something"
	Read- read the passage again more slowly trying to answer those questions	-Read one section at a time
	Recall or **R**ecite- recall as much as you can from the passage	-Answer the questions in your own words -Say them aloud and/or write them down
	Review – reread the passage to see what you have forgotten	-Review the information numerous times with breaks in between

Transportation in the 1800s

Listen to the following passage that will be read aloud by your therapist. The passage is one page long.

Try to remember as many facts as you can. You will be given a quiz following this reading.

Remember to apply internal strategies as you are listening!

Quiz: Transportation in the 1800s[15-17]

1. During the beginning of change to the nation's economy, which three areas did the North show interest in _____, _____, and _____.

2. In 1807, which mode of transportation was introduced?

   _____

3. In what year was the Erie Canal built? _____

4. Which two natural bodies of water were the primary sources of transportation between the north and the south?

   _____

   _____

5. The length of the Erie Canal exceeded the longest canal of that time by how many miles?

   _____

6. Ten years after the canal was built, they had to increase the size to what (width and depth).

   _____

7. The Erie Canal decreased travel time from Buffalo to New York City from 20 days to _____days.

8. In what year was the first locomotive launched? _____

9. How many miles did the first locomotive travel on its first run? _____

10. Transporting freight along the Erie Canal reduced freight charges from _____ dollars a ton to _____ dollars a ton.

4: Planning and Organization

Session 1: Executive Functions

Executive Functions are used in goal-setting, planning how to achieve your goals, carrying out the plans to achieve your goals, and modifying your plans as needed in order to achieve your goals.

Executive Functions include the following:

- **Goal Setting.** Thinking about what you want to achieve
- **Memory/Problem Solving.** Remembering what needs to be done to achieve your goal if it is something you've done before, or thinking about what needs to be done to achieve a new goal
- **Planning/Organization/Sequencing.** Prioritizing Actions/Behaviors with the intent to achieve your goals
- **Initiating.** Beginning work on your plan
- **Attention.** Maintaining your attention long enough to complete a task
- **Self-Monitoring/Inhibiting.** Evaluating how you are doing on tasks and modifying your behaviors in a way that will achieve your goal

Importance of planning, time management, and organization

Everything we do involves planning, time management, and organization no matter what the task, no matter how small or big. The more complicated, the more planning, time management, and organization required.

Simple tasks, and those that we complete on a regular basis, may seem as they are skipped, but even the smallest tasks involve planning, time management, and organization. For example, walking to the mailbox to pick up the mail:

- **Goal**. To retrieve the mail from the mailbox at the end of the driveway
- **Strategy.** Walk to mailbox, without being distracted by something else and get mail
- **Organize resources.** Will need shoes, coat if during cold months
- **Monitoring progress.** Did you complete the task in a timely manner?

Planning involves using a set of strategies in order to accomplish a goal. Components of planning include prioritization, sequencing and foresight. It may involve both short-term and long-term goals and taking all aspects of a situation into consideration while making a plan.

Time Management is the ability to create and follow a schedule, meet deadlines, prioritize and minimize distractions (not focus on unimportant tasks) so that tasks and projects get done.

Organization involves a systematic approach that facilitates goal-directed behavior. It may involve sequencing and analysis of a complex situation, and it promotes efficiency and task completion.

Factors affecting planning, time management, and organization

Positive:

1. Setting realistic/accomplishable goals (short-term and long-term)
2. Consistently using systematic planning tools (smart phones, day planners)
3. Wisely budgeting your time (using a timeline, set a start/end time, block your schedule)
4. Setting alarms or timers to pace your work
5. Organizing your environment (living quarters, files/paperwork, finances, medications)
6. Reviewing your goals regularly
7. Being able to adapt to the changes necessary to accomplish your goals (mental flexibility)

Negative:

1. Not setting goals
2. Not committing to your plans/relying on others too much
3. Difficulty prioritizing
4. Not keeping your room, closet, or desk organized
5. Forgetting to bring important items or paperwork
6. Not keeping track of time
7. Becoming too frustrated

Lack of planning, time management, and organization

Lack of planning, time management, and organization can negatively affect how successfully you achieve your goals.

Examples of negative effects:

1. You forget about a mandatory meeting with your Command
2. You forget to buy needed items for dinner tonight
3. You forget to put money aside for your car/truck payment
4. You are late getting out of bed and you are listed as a "No Show" for an appointment
5. You frequently lose your wallet, watch, dog tags, identification, orders, medical records for medical evaluation board
6. You schedule two things at one time (both may be equally important)
7. You lose track of time and forget to pick up your child from day care on time

Session 2: APT-3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
Listen for number 1	*Self-talk (repeat target to self)*	*Scanning through emails and looking for a specific date.*	*As you are scanning, say the date aloud over and over. It will be easy to identify when what you see matches what you hear.*

APT-3 Task	Strategies used during the APT-3 exercise	How does this APT-3 activity/task relate to a real life situation?	Identify a strategy you could apply in this real life situation?

APT-3 Strategy Examples

Re-auditorizing
Visualizing
Verbal self cueing
Counting on fingers
Closing eyes
Breathing
Pacing
Body alert
Looking at screen
Working toward a goal
Self-talk
Rewards self
Breathing/relaxation
Clinician encouragement
Repeating instructions
Writing a reminder

Generalization Strategy Examples

Visualization
Verbal self cueing
Self-talk (repetition of task/goal)
Visual cues (post its, leave item in view)
Auditory Cues (alarms, timers)
Take notes
Decrease distractions
Modify Environment
Take breaks
Break task into parts

Session 3: Organizing Personal Papers

Questions for Service Members to promote metacognition:

1. Why did I keep this paper?
2. Is this paper still important to me?
3. Is this something I should keep or throw away?
4. Should I include this with previous papers?
5. Is this information I need to share with anyone else?

Tips for the Service Member:

Sometimes sorting may involve more than just a shoebox and can take some time, planning and attention.

- If you notice yourself losing attention while sorting and begin to rush, take a short break. You may return to the activity later.
- If this activity will take several hours that you don't have, set a goal to organize for 30 minutes a day until the task is done. Set a timer to let you know when 30 minutes has past.
- Sort/organize all of the papers (e.g., receipts, junk mail, catalogs, Army forms, bills, etc.) into appropriate categories. You may use the box below for scratch paper. Answer the questions below after you have completed the activity.

What strategy or technique did you apply during this activity that was successful?

_____

What step or strategy would you change following this activity to have had a better outcome, if any?

_____

5: Prospective Memory & Assistive Technology

Session 1: The Memory System[5-7]

Stages of memory storage

Sensory

- Sensory input that is registered in and relayed to the brain. Lasts only a few seconds and may be incidentally or subconsciously transferred to short-term memory.

Short-term

- Also known as the "crossroads of the memory system." Short-term memory holds and processes information that is received from sensory memory and retrieved from long-term memory. It must hold on to information for approximately 30 seconds before the information can be transferred to long term memory. If information is not utilized, it is forgotten.

Long-term

- Stores information indefinitely. Information stored is generally in an inactive form and remains available for retrieval at another time.

Steps of the memory process

Attention

- The cognitive process of concentrating on one aspect of the environment while ignoring other things.

Encoding

- The initial stage of memory. Encoding is the analysis performed on materials to be remembered.

Storage

- When information is encoded, it is stored in long-term memory.

Consolidation

- Processing that stabilizes a memory trace after initial acquisition (also known as the process of practicing). Often thought of as categorizing and organizing the memories. Repetition helps consolidation.

Retrieval

- Searching for or activating existing memories. Retrieval requires the ability to monitor the accuracy and appropriateness of the memories pulled from storage.

Prospective memory: —What is it?

What is it? Prospective memory is also commonly referred to as "everyday memory."

Prospective memory is remembering to initiate intended action for a future time. This type of memory is very practical. It allows you to complete day-to-day activities, like paying your bills, picking up medication or changing the oil in your car.

Daily effects of memory and attention difficulties

Common difficulties following concussion and brain injury include remembering information and events that occurred following injury. Typically, memories before the injury are unaffected. Memory and learning difficulties can negatively affect individuals in their personal lives, ability to function at home and the way they perform at work and school.

Common memory difficulties that affect home and personal life include forgetting the following:

- Birthdays and anniversaries
- To pay bills
- Whether you left the stove or iron on
- Where you placed your car keys
- Groceries (e.g., items on list & bags in your car)
- Where you placed various items around your house
- To do daily chores around the house (e.g., take out trash, unload the dishwasher)
- Details from conversations

Common memory difficulties that can affect work and school include forgetting the following:

- Appointment and meeting times
- Meeting locations
- People's names
- Telephone numbers
- Details of things you have read
- To pass on a message
- To check your calendar

Many of these difficulties with memory and attention are experienced by the general population. Although you may be experiencing them for the first time or more often than before, some of the strategies you can use to improve your functioning are basic strategies commonly used by others around you. One study[11] revealed some things people with and without mTBI forget:

"Symptom"	Percentage of people who forget
Forgets telephone numbers	58%
Forgets people's names	48%
Loses car keys	31%
Forgets groceries	28%
Loses items around the house	17%
Forgets content of daily conversations	17%

External memory strategies

External Memory Strategies		
External strategies and devices are cues that are externally driven to remind you of something!		
Device/Strategy	**Types**	**Examples**
Notebook	▫ Spiral notebook ▫ Leader book ▫ Pocket-sized notebook	Take notes in your notebook each day. Date the top of each page to have an organized way to refer to your notes.
Calendar	▫ Monthly wall calendar ▫ Desk calendar ▫ Pocket calendar ▫ Planner ▫ PDA or smartphone calendar ▫ Calendar on computer ***Pay attention to the layout and space on the calendar (daily, weekly, monthly, etc.). If the calendar does not meet your needs, you will likely not use it!*	Place a monthly wall calendar with appointments in visible sight. Use a pocket calendar to carry around each day and write reminders immediately. Use a computer calendar with alerts and alarms.
Checklist	▫ Checklists developed in personal notebook ▫ Commercially printed checklists ▫ Checklists on post-it notes ▫ Checklist/task list application in smartphone	Develop lists in your personal notebook, place checkboxes by each task or cross them off when completed. Number tasks by priority to help with organization. Make two columns on your checklist (low and high priority).
Electronic Organizer	▫ PDA ▫ Smartphone ▫ Tablets ▫ Computers	Use the calendar or task list function on these devices to stay organized. Use documents or spreadsheets to stay organized. Download applications from your cell phone provider's application store for medication reminders, grocery lists & packing lists.
Computer	▫ PDA ▫ Email program checklists and reminders ▫ Documents and folders ▫ Spreadsheets	Use calendars on your computer to set up alerts and alarms for meetings. Use programs on your computer to develop spreadsheets for tracking information. Scan documents and store them in organized folders in your computer.

External Memory Strategies		
Device/Strategy	**Types**	**Examples**
Recorder	▫ Handheld digital recorder ▫ Recorder on PDA ▫ Recorder on smartphone	Record information that is presented too quickly to write down and listen to it later. Write notes then if possible. Record yourself reading and then listen to the information in the car or through your MP3 player for repetition.
Alarm	▫ Alarm clocks ▫ Alarms on PDAs and smart phones ▫ Alerts on smartphones, PDAs, watches and calendars	Use alarms for medication reminders. Use alarms to remind you when you leave the house.
Timer	▫ Timers on smartphones ▫ Portable kitchen timers ▫ Timers on appliances ▫ Stopwatches	Use timers to redirect you to a task. Use alarms to set scheduled breaks (I will read for 20 minutes).
Watch	▫ Stopwatches ▫ Clocks ▫ Watch timers	Use watches to help with time management.
Medication Dispenser	▫ Commercial dispensers (daily/weekly)	Use dispensers to keep track of medications and whether you have taken them.
Highlighter	▫ Marker highlighters ▫ Colored tabs ▫ Colored notes ▫ Colored pencils	Highlight important information on documents. Color code events on calendars. Place colored paper in areas for visual cues.
Camera	▫ Picture function ▫ Video function ▫ Digital cameras ▫ Cameras on smartphones	Take pictures of notes or diagrams presented during a lecture or meeting. ****with permission* Take video of information that needs to be remembered or referred to later.****with permission* *Helpful when information presented is at a quick rate, too fast for you to capture important information.*

Tips for technology

Smartphones and tablets are becoming more widely used as external cognitive aids. Similar devices have been around for years, such as PDAs and palm pilots. Eventually, persons reading this manual will be using new technology to help manage their busy lives. Here are things to consider when using technology for cognitive aids.

TIPS	NOTES
Ensure the device is charged. ***Most technological devices will not be helpful if you cannot turn them on.***	Set a routine to charge the device nightly. Place a charger by your bed if you use the system as an alarm. Consider using a commercially designed charging station to ensure all of your technology is charged when you need it.
Back up the information. ***Most devices have a recommended system for backing up the information on your home computer by syncing the devices. This is helpful if you lose your device or if it breaks.***	Develop a routine to back your device up daily or weekly. Syncing may also ensure contacts and information on calendars correspond between devices.
Adjust the home screen. ***The home screen is the screen you typically first see when you have just turned on your device. Some devices allow you to manually adjust the information on the home screen and some automatically adjust based on frequency of use.***	Place tasks and programs used daily on the front screen for easy access (typically for smartphones). In addition to selecting a program from the touch screen, the devices can also be programmed to use buttons on the hardware to access popular programs (example: calendar, contacts and audio recorder).
Adjust the settings on your device. ***Some devices allow you to adjust the settings of various applications.***	Adjust the sound if you are unable to hear the alarm. Adjust the font size. Adjust access to information on touch screen phones (example: 1 vs. 2 taps to select an application, similar to single vs. double clicking a computer mouse).
Adjust alarm noises. ***Adjust the sound of alarms and alerts.***	Differentiate alarms and alerts by using various ringers or tones. If you begin to get used to an alert, causing you to ignore it, change the sound (e.g., from car alarm to doorbell).
Use the calendar function wisely. ***Utilize the various options available in these applications.***	If you work out daily at 5 am, use the reoccurring function in order to enter in the information one time vs. 30 times each month. Determine whether your device allows you to color code or categorize information entered (e.g., birthdays, appointments). View your calendar in the mode that is best for you. Most devices allow you to view your calendar in monthly, weekly, daily, yearly and agenda modes.

TIPS	NOTES
Utilize commercially available applications. *Some programs and applications come directly on your phone; however, you can often obtain even more through the company from which you purchased the device.* *As they say, there is an "app" for just about everything, and many of them are free.*	Use applications for TO DO lists, grocery lists, packing lists, meal planning, remembering medications and taking notes. Applications can also help with directions, planning, budgeting, organization, entering information in devices quickly and sharing contacts. When purchasing an application through a cellular provider or company, you can often find what you are looking for by typing a key term into a search function on the site you are using (such as 'TO DO list').

Technology is changing and evolving daily. There are many benefits to using technology and high-tech devices. You can find popular programs and applications by:

- ☐ Searching for programs and applications in an internet search engine
- ☐ Reading technology reviews online and in magazines
- ☐ Inquiring about programs at your local electronics store or wireless provider store
- ☐ Asking a friend, colleague or your clinician

Selecting a System

When selecting a system or aid to help manage your schedule and daily tasks, it is important to think of all the aspects of that particular system or device. Often making a simple pros and cons list will help you identify the details of each device and ultimately which one will work best for you. If necessary, you can always change or modify the chosen system if it is not successful.

SYSTEM	PROS	CONS
Smartphone	- Fits in pocket - Already take it everywhere - Has alarms and reminders - Able to purchase "apps"	- Can malfunction - Battery can die - Takes longer to type notes (large thumbs)
Monthly calendar	- More writing space - Able to see the whole month at a time - Able to cross off items when done - Able to write information quickly	- No alarms - Have to remember to check - Do not carry it everywhere - Too big for pocket - Messy handwriting/write too big

You can also use this chart when you are trying to decide between specific systems such as a touch screen phone vs. one with a keyboard or a type of calendar.

SYSTEM	PROS	CONS
Daily Calendar	- More writing space - Structured by hour (very specific)	- Calendar is larger - Must turn page to see ahead - Bigger calendar due to # of pages
Weekly Calendar	- Reasonable amount of writing space	- Only see a week at a time
Monthly Calendar	- Can see overall schedule	- Not enough writing space - Can only write big tasks

If you are trying to identify which system to use, use the table below to help with your decision.

SYSTEM	PROS	CONS

Session 2: APT – 3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
Listen for number 1	*Self-talk (repeat target to self)*	*Scanning through emails and looking for a specific date.*	*As you are scanning, say the date aloud over and over. It will be easy to identify when what you see matches what you hear.*

APT-3 Task	Strategies used during the APT-3 exercise	How does this APT-3 activity/task relate to a real life situation?	Identify a strategy you could apply in this real life situation?

APT-3 Strategy Examples

Re-auditorizing
Visualizing
Verbal self cueing
Counting on fingers
Closing eyes
Breathing
Pacing
Body alert
Looking at screen
Working toward a goal
Self-talk
Rewards self
Breathing/relaxation
Clinician encouragement
Repeating instructions
Writing a reminder

Generalization Strategy Examples

Visualization
Verbal self cueing
Self-talk (repetition of task/goal)
Visual cues (post its, leave item in view)
Auditory Cues (alarms, timers)
Take notes
Decrease distractions
Modify Environment
Take breaks
Break task into parts

Session 3: Homework

1. Can a person **consolidate** information about new procedures for cleaning a weapon if he or she has trouble paying **attention** to his or her instructor? Why or why not?

_____

_____

_____

_____

_____

_____

_____

2. Can a person pay attention to the task of cleaning a weapon, heating his meal-ready-to-eat (MRE) and talking about the Minnesota Viking offense at the same time? Why or why not?

_____

_____

_____

_____

_____

_____

_____

_____

How will you remember…?

Identify <u>TWO</u> external strategies/cues, per item, that you would apply to improve your ability to remember the following tasks and events.

Role-Play exercise: **How are you going to remember the following, if applicable?**

1. A parent's birthday
2. The next time you need to get medication from the pharmacy
3. Your squad leader's phone number
4. An account pin number
5. The location of a good Italian restaurant in your town
6. Your anniversary date
7. A friend's favorite flower
8. A friend's favorite cake flavor
9. The license plate number on your car
10. The code to your home alarm system
11. The place where you keep your winter clothes
12. When you need to pay your credit card bill(s)
13. When your rent or mortgage payment is due
14. The name of your child's teacher
15. When your child has their next ball game
16. Where you go to get your car repaired
17. The name of a piece of music you want to purchase
18. The name of your neighbor(s)
19. When your cell phone bill is due
20. Your brother or sister's birthday
21. Father's day
22. Where you are planning to go this weekend
23. The location of your bank (nearest branch)
24. The day school starts and ends for your children
25. The clothes you need to purchase within the next two weeks
26. What you need to purchase at the grocery store

Where are my car keys? (Part 1)

Did you know that 31percent of Americans routinely misplace their car keys? Are you part of this statistic? If so, you might think about changing the way you organize your home and office. Here are a few ideas to reorganize your space and help you remember where those keys are, as well as everyday tasks and responsibilities.

- Place items you need to take outside the home (e.g., smartphone, wallet, SCORE manual) in a place you see as you leave the home. This will cue you to take the item(s) with you.
- Place your calendars and 'to do' lists (if you use these) in areas of your home or work where you will see them throughout the day.
- Place your calendars and to-do lists in areas of your home or work that are free of visual clutter. If your calendar is one of many pieces of brightly colored paper hanging on your wall, you are less likely to pay attention to it.
- Place your alarmed memory devices (e.g, smartphone, tablet, timers) near where you spend time at home or work. An alarm is no good to you if it is sounding in the bedroom when you are in the back yard with the kids.

Specialist Smith's home

Look at the model of Specialist Smith's home. He needs help changing his home to help remember things. At this time, he routinely cannot find his car keys or his smartphone when leaving in the morning. He also forgets to take his medications in the morning. Furthermore, he often forgets to stop at the commissary to get milk and bread for his family after work. He rarely remembers important family dates like birthdays or parents' day at his son's school. Look at Specialist Smith's house model and rearrange the personal items in the home to help him remember important responsibilities.

Identify the strategies used to modify Specialist Smith's environment:

_____

_____

_____

_____

_____

_____

_____

Where are my car keys? (Part 2)

Did you know that 31 percent of Americans routinely misplace their car keys? Are you part of this statistic? If so, you might think about changing the way you organize your home and office. Here are a few ideas to reorganize your space and help you remember where those keys are, as well as everyday tasks and responsibilities.

- Place items you need to take outside the home (e.g., smartphone, wallet, SCORE manual) in a place you see as you leave the home. This will cue you to take the item(s) with you.
- Place your calendars and to-do lists in areas of your home or work where you will see them throughout the day.
- Place your calendars and to-do lists in areas of your home or work that are free of visual clutter. If your calendar is one of many pieces of brightly colored paper hanging on your wall, you are less likely to pay attention to it.
- Place your alarmed memory devices (e.g., smartphone, tablet, timers) near where you spend time at home or work. An alarm is no good to you if it is sounding in the bedroom when you are in the back yard with the kids.

How can you change up the way **your** office or home is organized to help you remember what you need to do today, tomorrow, or later this week?

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

6: Alternating Attention

Session 1: The Memory System [5-7] and Attention

Stages of memory storage

Sensory
- Sensory input that is registered in and relayed to the brain. Lasts only a few seconds and may be incidentally or subconsciously transferred to short-term memory.

Short-term
- Also known as the "crossroads of the memory system." Short-term memory holds and processes information that is received from sensory memory and retrieved from long-term memory. It must hold on to information for approximately 30 seconds before the information can be transferred to long term memory. If information is not utilized, it is forgotten.

Long-term
- Stores information indefinitely. Information stored is generally in an inactive form and remains available for retrieval at another time.

Steps of the Memory Process

Attention
- The cognitive process of concentrating on one aspect of the environment while ignoring other things.

Encoding
- The initial stage of memory. Encoding is the analysis performed on materials to be remembered.

Storage
- When information is encoded, it is stored in long-term memory.

Consolidation
- Processing that stabilizes a memory trace after initial acquisition (also known as the process of practicing). Often thought of as categorizing and organizing the memories. Repetition helps consolidate.

Retrieval
- Searching for or activating existing memories. Retrieval requires the ability to monitor the accuracy and appropriateness of the memories pulled from storage.

What is attention?[8,9]

Focused attention:

The ability to respond discretely to particular visual, auditory, or tactile stimulation.

Sustained attention:

The ability to sustain a steady response during continuous activity. It is commonly called concentration.

Selective attention:

The ability to maintain attention with distracting or competing stimuli present. These distractions may be either external (noise) or internal (worries).

Alternating attention:

The ability to shift focus between tasks or shift attention from one thing to another.

Divided attention:

The ability to simultaneously respond to multiple tasks or to do more than one activity at a time.

Examples:	
Reading an operational manual	Sustained
Reading emails with the radio on	Sustained & Selective
Answering text messages while listening for basketball scores on the television	Sustained & Alternating
Talking with a friend and listening for your name while waiting to be seated at a restaurant	Sustained & Divided
Talking on the cell phone	Sustained
Talking on the cell phone while watching a football game	Sustained & Selective
Ordering pizza on the phone and asking someone in the room for toppings	Sustained & Alternating
Talking on the cell phone while driving a car (not recommended)	Sustained & Divided

Metacognitive rating scale[2]

Rate the following regarding the YES/NO Trivia Address Card exercise:

How hard did your brain work on that exercise?

0	1	2	3	4	5	6	7	8	9	10
Super Easy					Had to think				Crazy Hard	

How motivated were you to complete that exercise?

0	1	2	3	4	5	6	7	8	9	10
I gave up			I spaced out for some of it			I was pretty focused				I was in the zone

How did the familiarity with each task affect/not affect performance?

_____

What are similar challenges in real life scenarios?

_____

Juggling duties and challenges

In the listed areas, identify instances where you are required to complete concurrent tasks.

Identify problem areas where breakdowns occur and possible solutions to improve performance. Be prepared to discuss them for Session 3.

Tasks	Current Challenges	Possible Modifications
Home Cooking dinner & helping child with homework	Forgetting items on stove	Ask child to try homework and then help when you are at a better point to pause cooking
Work Answering phone, email, & completing work orders	Forgetting messages	Write down message during call, not answer phone, turn off email
Household Laundry & cleaning floors	Forgetting sometimes to move clothes to dryer	Use kitchen timer as a reminder to switch clothes to dryer

Session 2: APT-3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
Listen for number 1	*Self-talk (repeat target to self)*	*Scanning through emails and looking for a specific date.*	*As you are scanning, say the date aloud over and over. It will be easy to identify when what you see matches what you hear.*

APT-3 Task	Strategies used during the APT-3 exercise	How does this APT-3 activity/task relate to a real life situation?	Identify a strategy you could apply in this real life situation?

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Clinician encouragement
Repeating instructions
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Take notes
Decrease distractions
Modify Environment
Take breaks
Break task into parts

Session 3: Audio Recording and Zip Code Location Activity

Audio recording questions

You will hear a set of audio recordings and then answer the following questions. At the same time, you will complete the Zip Code Location task.

Refer to *Zip Code Location*.

Take 1 minute to review the questions before we begin.

	Play chosen audio recordings

Questions	*Answers*
1	
2	
3	
4	
1	
2	
3	
4	
1	
2	
3	
4	

Zip Code location and Zip Code map

Use this Zip Code Location sheet along with the Zip Codes Map worksheet (next page). The goal is to identify which zip codes below can be identified on the map of SCORE County. When you have identified a matching zip code, either circle or highlight it on the map. During this activity you will also be listening to an audio recording. Your goal is to practice alternating your attention between the tasks and using strategies. Refer to the Optimizing Attention handout for additional attention strategies.

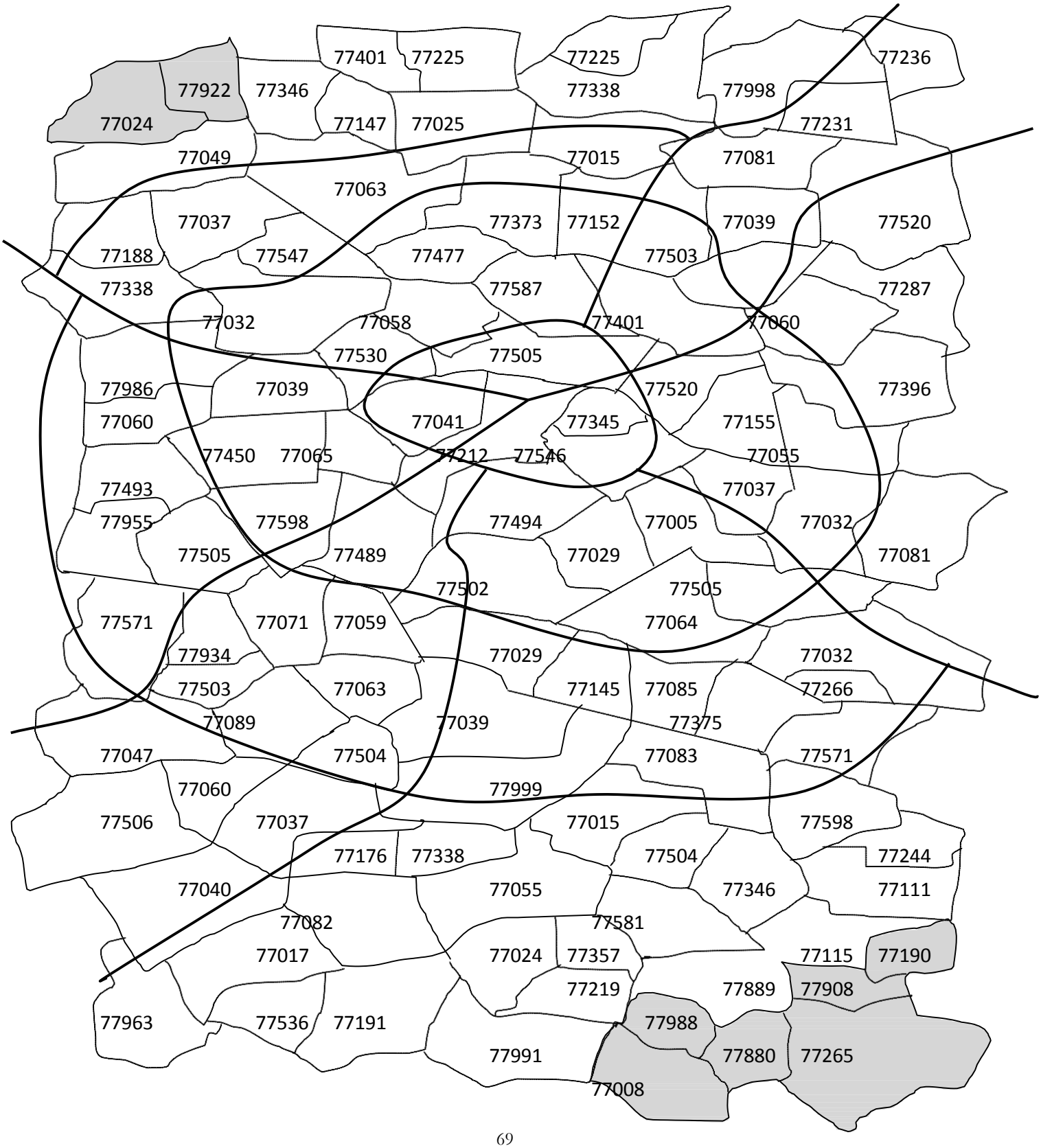
Strategy Examples:

- Use pencil markings to keep track of your location on the page,
- Develop a system or pattern when alternating between the zip code location list and map,
- Use self-talk or repetition to help remember zip codes or information from the audio recordings.
- Write quick notes about the information from the audio recording to improve encoding.

Zip Codes					
77064	77015	77401	77587	77083	77506
77396	77346	77081	77005	77504	77602
77024	77338	77520	77025	77611	77017
77656	77614	77619	77622	77040	77613
77049	77060	77029	77338	77059	77346
77401	77039	77063	77373	77024	77603
77081	77037	77029	77055	77063	77060
77520	77032	77547	77477	77571	77058
77687	77654	77689	77688	77071	77065
77338	77653	77503	77375	77504	77085
77032	77032	77015	77609	77581	77489
77037	77037	77530	77055	77089	77058
77536	77754	77656	77047	77571	77450
77039	77039	77505	77505	77502	77546
77060	77612	77598	77041	77503	77598
77338	77082	77493	77494	77505	77992

Zip Codes Map

Use the following map with the Zip Code Location Activity



Internal memory strategies

Internal Memory Strategies		
Internal memory aids are often used to help an individual process information in a way that improves their ability to encode, consolidate and retrieve information more easily.		
Strategy	**Definition**	**Examples**
Visual Imagery	Create an image in your mind of something you want to remember.	Visualize yourself driving when you are listening to directions. Picture yourself turning at the light.
Active observation	Observe and actively pay attention to your environment.	Actively pay attention to your surroundings while driving.
Association	Relate something that is unfamiliar to something you already know or are familiar with.	Recall a family member's birthday by relating it to a major holiday, names, places, dates, concepts.
Rehearsal	Repeat information in your mind or aloud to improve encoding.	Repeat something quickly to yourself for immediate recall, such as a phone number. Repeat something over a longer period of time to encode for delayed recall or store in your long term memory, such as facts from class or someone's name.
First letter cues	Focus on the first letter of a word to help learn or memorize it. Use the first letter as a cue to retrieve that word.	**Mnemonics.** The first letters of sugar, tea, eggs, milk spell STEM. Another example is using Never Eat Sour Watermelons to remember North, East, South, West. **Acronyms.** BSEP stands for Basic Skills and Education Program.
Rhymes (sayings)	Link ideas and facts together by rhyming, developing patterns between words or lyrics.	"i" before "e" except after "c."
Categorizing	Group information into meaningful sets.	Need to remember 6 things to get from the storage shed: 2 boxes of baseball equipment, 1 box of ski gear, 2 boxes of study manuals, 1 box of baby toys.
Story method	Develop a story that incorporates all of the things you want to remember.	Kingdom, Phylum, Class, Order, Family, Genus, Species *I will rule the kingdom. And my people, I will file em' (phylum) by class. I will be able to order my family around. I will be the most genius (genus) of our species.*
Chunking	When reciting words or numbers for immediate memory, chunk them into threes or twos.	When memorizing a driver's license number, break up the number into patterns.

External cognitive aids

External Memory Strategies		
External strategies and devices are cues that are externally driven to remind you of something!		
Device/Strategy	**Types**	**Examples**
Notebook	▫ Spiral notebook ▫ Leader book ▫ Pocket-sized notebook	Take notes in your notebook each day. Date the top of each page to have an organized way to refer to your notes.
Calendar	▫ Monthly wall calendar ▫ Desk calendar ▫ Pocket calendar ▫ Planner ▫ PDA or smartphone calendar ▫ Calendar on computer ***Pay attention to the layout and space on the calendar (daily, weekly, monthly, etc.). If the calendar does not meet your needs, you will likely not use it!*	Place a monthly wall calendar with appointments in visible sight. Use a pocket calendar to carry around each day and write reminders immediately. Use a computer calendar with alerts and alarms.
Checklist	▫ Checklists developed in personal notebook ▫ Commercially printed checklists ▫ Checklists on post-it notes ▫ Checklist/task list application in smartphone	Develop lists in your personal notebook, place checkboxes by each task or cross them off when completed. Number tasks by priority to help with organization. Make two columns on your checklist (low and high priority).
Electronic Organizer	▫ PDA ▫ Smartphone ▫ Tablets ▫ Computers	Use the calendar or task list function on these devices to stay organized. Use documents or spreadsheets to stay organized. Download applications from your cell phone provider's application store for medication reminders, grocery lists & packing lists.
Computer	▫ PDA ▫ Email program checklists and reminders ▫ Documents and folders ▫ Spreadsheets	Use calendars on your computer to set up alerts and alarms for meetings. Use programs on your computer to develop spreadsheets for tracking information. Scan documents and store them in organized folders in your computer.

External Memory Strategies		
Device/Strategy	**Types**	**Examples**
Recorder	▫ Handheld digital recorder ▫ Recorder on PDA ▫ Recorder on smartphone	Record information that is presented too quickly to write down and listen to it later. Write notes then if possible. Record yourself reading and then listen to the information in the car or through your MP3 player for repetition.
Alarm	▫ Alarm clocks ▫ Alarms on PDA's and smart phones ▫ Alerts on smartphones, PDA's, watches and calendars	Use alarms for medication reminders. Use alarms to remind you when you leave the house.
Timer	▫ Timers on smartphones ▫ Portable kitchen timers ▫ Timers on appliances ▫ Stopwatches	Use timers to redirect you to a task. Use alarms to set scheduled breaks (I will read for 20 minutes).
Watch	▫ Stopwatches ▫ Clocks ▫ Watch timers	Use watches to help with time management.
Medication Dispenser	▫ Commercial dispensers (daily/weekly)	Use dispensers to keep track of medications and whether you have taken them.
Highlighter	▫ Marker highlighters ▫ Colored tabs ▫ Colored notes ▫ Colored pencils	Highlight important information on documents. Color code events on calendars. Place colored paper in areas for visual cues.
Camera	▫ Picture function ▫ Video function ▫ Digital cameras ▫ Cameras on smartphones	Take pictures of notes or diagrams presented during a lecture or meeting. ****with permission* Take video of information that needs to be remembered or referred to later.****with permission* *Helpful when information presented is at a quick rate, too fast for you to capture important information.*

Metacognitive rating scale[2]

Rate the following regarding the previous exercise, Zip Code locations:

How hard did your brain work on that exercise?

0	1	2	3	4	5	6	7	8	9	10
Super Easy					Had to think				Crazy Hard	

How motivated were you to complete that exercise?

0	1	2	3	4	5	6	7	8	9	10
I gave up			I spaced out for some of it			I was pretty focused				I was in the zone

How did the familiarity with each task affect/not affect performance?

What are similar challenges in real life scenarios?

SCORE Summary

SCORE Summary **List three examples of things you have learned in this course that support achieving the goals you identified.**	
GOAL	STRATEGY
Completing college class	Using highlighters while reading class notes

References

1. Turner-Strokes, L. (2009). Goal attainment scaling (GAS) in rehabilitation: a practical guide. *Clinical Rehabilitation, 23*; 362-370.
2. Sohlberg, M. M. and Mateer, C. A. (2010). Attention Process Training -3 (APT-3): A Direct Attention Training Program for the Remediation of Attention Deficits: APT-3 Manual. Lash & Associates Publishing/Training Inc., Youngsville, North Carolina.
3. Kiresuk, T. J., & Sherman, R. E. (1968).Goal attainment scaling a general method for evaluating comprehensive community mental health programs. *Community Mental Health Journal*, *4*; 443-453.
4. Malec, James F (1999). Goal attainment scaling in rehabilitation. *Neuropsychology Rehabilitation, 9* (3/4); 253-275.
5. Malia, K. B., Bewick, K. C., Raymond, M. J., & Bennet, T. L. (2002). Brainwave-R, Cognitive Strategies and Techniques for Brain Injury Rehabilitation – Memory. Pro-ed, Austin, Texas.
6. Malia, K. B., Bewick, K. C., Raymond, M. J., & Bennet, T. L. (1996, December). A Comprehensive Approach to Memory Rehabilitation Following Brain Injury, *The Journal of Cognitive Rehabilitation*.
7. Atkinson, R. C., & Shiffrin, R. M. (1968). Chapter: Human memory: A proposed system and its control processes. In Spence, K. W., & Spence, J. T. *The psychology of learning and motivation* (Volume 2). New York: Academic Press. pp. 89–195.
8. Bennett, T. L., Malia, K., Linton, B., Raymond, M., & Bewick, K.. (1998). Rehabilitation of Attention and Concentration Deficits Following Brain Injury. *The Journal of Cognitive Rehabilitation,* (8-13).
9. Sohlberg, McKay, M., Mateer, Catherine, A. (2001) Cognitive Rehabilitation. New York: Gilford Press.
10. Tadomski, M. V., Weightman, M. M., Davidson, L., Rodgers, M., & Bolgla, R. (2010). Clinical Practice Guidance: Occupational Therapy and Physical Therapy for Mild Traumatic Brain Injury. Falls Church, VA: Army Office of the Surgeon General, Rehabilitation and Reintegration Division. Internal Document.
11. Mittenberg, W., DiGiulio, D. V., Perrin, S., & Bass, A. E. (1992). Symptoms Following mild head injury: expectation as etiology. *Journal of Neurology, Neurosurgery, and Psychiatry, 55,* 200-204.
12. U.S. Army Office of the Surgeon General Proponency Office for Rehabilitation and Reintegration. (2010). Mild traumatic brain injury toolkit: occupational and physical therapy sections. Draft 2.0, not in press.
13. Robinson, Francis Pleasant (1970). Effective study (4th ed.). Harper & Row, New York, N.Y.
14. Berg, Paul C. & Spache, George D. (1966). The Art of Efficient Reading. 2nd edition. The Macmillan Company, New York, NY. Page 93.
15. Norton, M., Katzman, D., Escott, P., Chudacoff, H., Paterson, T., Tuttle, W., & Brophy, W. (1999). A People and A Nation. Houghton Mifflin Company, Boston, MA.
16. Thies, C.F. (2002). The American Raildroad Network during the Early 19th Century: Private versus Public Enterprise. *CATO Journal*, 22-2, 229.
17. Woods, R.O. (2009). The Genesis of the Steamboat. Mechanical Engineering, 131-4; 44-47.

Appendix A: Acronyms

APT	Attention Processing Training
BSEP	Basic Skills and Education Program
GAS	Goal Attainment Scaling
IED	improvised explosive device
MRAP	mine-resistant ambush-protected
MRE	meal-ready-to-eat
mTBI	mild traumatic brain injury
PDA	personal digital assistant
PQRST	preview, question, read, state/summary, test
SCORE	Study of Cognitive Rehabilitation Effectiveness
SMART	specific, measurable, attainable, realistic, timely (goals)
SQ3R	survey, question, read, recall/recite, review
STEM	sugar, tea, eggs, milk
TBI	traumatic brain injury

Appendix B: APT-3 Generalization Form[2]

DATE:

Example:

APT-3 Task	Strategies Used in APT-3	How does this APT-3 activity relate to a real life situation?	Identify a strategy you could apply in this real life situation?
Listen for number 1	*Self-talk (repeat target to self)*	*Scanning through emails and looking for a specific date.*	*As you are scanning, say the date aloud over and over. It will be easy to identify when what you see matches what you hear.*

APT-3 Task	Strategies used during the APT-3 exercise	How does this APT-3 activity/task relate to a real life situation?	Identify a strategy you could apply in this real life situation?

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Rewards self
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Clinician encouragement
Repeating instructions
Writing a reminder

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Take notes
Decrease distractions
Modify Environment
Take breaks
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