



NEURO
INSTITUTE

Continuing Education for Rehabilitation Professionals



Aging in the Community with a Brain Injury

Sarah Fischer, MS, CRC, CBIS, Program Coordinator
Mark Cola, CBIS, CDP, Director, Business Development
NeuroRestorative Pennsylvania

| Audio Check

To ensure that you can hear the presentation, please take a moment to double check your audio settings.

Go to the Audio tab in your GoToWebinar dashboard.

- If you have the option to select phone call, make sure you're dialed into the conference number.
- If you have only computer audio, check that your device isn't muted.
- If you're using listening devices such as headsets, double check they are plugged in/turned on.

NeuroRestorative's COVID-19 Response



We are committed to protecting the health and safety of the individuals we serve, our staff, and the community. Our services are considered essential, and we are taking precautions to minimize disruption to services and keep those in our care and our team members safe. In some programs, that has meant innovating our service delivery model through Interactive Telehealth Services. We provide Interactive Telehealth Services throughout the country as an alternative to in-person services. Through Interactive Telehealth Services, we deliver the same high-quality supports as we would in-person, but in an interactive, virtual format that is HIPAA compliant and recognized by most healthcare plans and carriers. In all of our programs, we are following guidance from the CDC and local health departments and continue to update our processes as the situation evolves to remain consistent with that guidance.

You can learn more about our COVID-19 prevention and response plan at our Update Center by visiting neurorestorative.com.

| NeuroRestorative Pennsylvania



Who We Are

Within NeuroRestorative PA, our program is a home and community-based provider of Cognitive Rehabilitation Therapy, Community Skills Training, Vocational Services and Behavioral Therapy for individuals with Brain Injury and other neurological diagnoses. In addition to these services, we also offer multiple Structured Day programs throughout the state.

| Objectives

- Identify the major barriers when working with the aging population
- Review and understand the aging process
- Identify the core components when treatment planning
- Understand the impact on the already injured brain
- Know the role of external factors that effect recovery

| What is Aging?

- Dictionary definition:
 - The process of growing old
- What does that really mean?
 - Physical changes
 - Cognitive changes
 - Changes to physical environment
 - Changes to social network

| Aging Today

- Ageism and Stereotypes
 - Cultural context influences how people experience growing old.
 - In the United States, ageism—negative stereotypes of older adults—is common.
 - In Asian nations, older people are honored—*filial piety*.

| Adulthood and Aging

- The Shrinking, Slowing Brain
 - Brain loss: 5-10% of weight in ages 20 to 90
 - Death of brain cells
 - Shrinkage of prefrontal cortex
 - General slowing of function in brain and spinal cord begins in middle adulthood and accelerates in late adulthood
 - Reductions in neurotransmitters

| Health and Disease

Chronic health problems, most common:

- Hypertension
- Arthritis
- Heart disease
- Sensory impairments
- Type 2 Diabetes
- Obesity
- *Atherosclerosis* (related to excess fats in diets)
- Misuse of medications leads to drug interactions or changes in metabolism.

| Adulthood and Aging

- Many adults don't get enough sleep
- Middle age may bring sleep problems
 - Wakeful periods at night, less deep sleep
- Many older adults go to bed earlier at night and wake up earlier in the morning
 - Afternoon naps
- Insomnia increases in late adulthood

| Sleep Across the Human Life Span

- Ages 1-2: sleep can range between 12-16 hours/day
- Ages 2-10: sleep can range between 10-12 hours/day
- Ages 10-50: sleep can range between 6-8 hours/day
- Ages 50-90: individuals average around 6 hours/day
- Ages 90 and over are less than 6 hours/day

Mental Processing Changes in Advanced Age

- Understanding various aspects of processing
 - Processing speed declines; slower on memory tasks; problem solving takes longer
 - Memory affected by aging
 - sensory memory declines
 - speed of working memory decreases
 - may take longer to organize, rehearse, and encode information
 - long-term memory may decline
 - But, overall, age-related declines in memory are gradual and nonconsequential, unless disease processes (like Alzheimer's disease) are involved.

| Cognitive Decline

- Dementia
 - chronic confusion, forgetfulness, and accompanying personality change
 - serious and life-altering
- General causes of cognitive decline
 - poor general health, non-stimulating environment, taking many prescription drugs
- Specific causes of cognitive decline
 - strokes
 - atherosclerosis
 - Alzheimer's disease

What Are the Differences?

Natural Aging

- Sometimes misplaces keys, eyeglasses, or other items.
- Momentarily forgets an acquaintance's name.
- Occasionally has to “search” for a word.
- Occasionally forgets to run an errand.
- May forget an event from the distant past.
- When driving, may momentarily forget where to turn; quickly orients self.
- Jokes about memory loss.

Aging with a TBI

- Frequently misplaces items.
- Frequently forgets people's names and is slow to recall them.
- Has more difficulty using the right words.
- Begins to forget important events and appointments.
- May forget more recent events or newly learned information.
- May temporarily become lost more often. May have trouble understanding and following a map.
- Worries about memory loss. Family and friends notice the lapses.

| Brain Injury and Aging

- Since aging produces a number of neurological problems in and of itself, it is important to discover what may happen to people with brain injury as they get older.
- Brain injury is not a short term condition, rather a chronic condition requiring many services and supports over the lifetime of an individual.

Brain Injury and Aging



- It appears that a brain injury makes the aging process even harder, with an increased risk of developing Alzheimer's Disease, non-Alzheimer's Disease-related dementia, and brain atrophy.
- It seems that the coping mechanisms that were set up when a person with a brain injury was younger decay as the portions of the brain that were called up to replace the injured portions age and die away.
- This means that older persons with brain injuries could have a greater need for in-home supports and specialized care. (ref: Pharmacopsychiatry DeDeyn et al)

| Aging with a TBI vs Sudden Onset of Injury

- Aging with a TBI
 - May see progressive decline of cognitive skills
 - More time to prepare for needs as they age
 - Time to adjust to injury and develop strategies
 - Time to build a natural support system
- Sudden Onset of Injury
 - Sudden change in cognitive skills
 - More urgent need to identify a plan of action for care and safety
 - Sudden need to change existing routines and habits
 - Potentially lack of significant support system

Prevalence of TBI in the Aging Population

People who are 65 years or older:

- Account for more than 60% of TBI's
- Are at a greater risk of TBI hospitalization and death than any other age group
- Falls are the most common cause of TBI's in older people.
- Many brain injuries are not recognized in older adults

| Primary Causes

- Falls-highest age 0-4 and age 75 and older
- Falls greater for older women than men
- 2/3 of those who fall will fall again within 6 months
- At least 1/3 of all falls among older people involve environmental hazards in the home
- Those who fall are 4 to 5 times more likely to be admitted to a long-term facility
- 60% of falls occur at home
- More likely to fall if taking 4 or more meds

| **Diagnosis**

- TBI is not always diagnosed immediately in older people
- Symptoms may not emerge immediately or be recognized as related to a TBI
- Symptoms can be harder to differentiate from baseline

Signs of a Possible Brain Injury with an Older Adult

- Look for a decline in mental capacity or sudden signs of dementia
- Changes in routine daily tasks such as work quality, daily chores not completed or even started, dressing-bathing neglected, financial problems become greater or more apparent
- Unusual behavior
- Suddenly irritable or combative, verbally disinhibited
- Unexplained bruises – head and face
- Complains of headaches, poor sleep, coordination

| Existing Problems May Worsen

- Word finding
- Confused by humor
- Unaware of errors
- Blame others for errors
- Miss or confuse nonverbals
- Frustration when trying to express thoughts

| **Sensory Problems**

- Hearing
- Taste
- Smell
- Vision - blurred, double, light sensitive
- Touch - sensitive, no sensation, fuzzy

| Balance Problems

- Unstable standing
- Cannot or risky bending
- Cannot or risky reaching
- Cannot or risky driving

| Emotional Problems

- Depression (54%) – Mood Swings
- Reduced emotional expression
- Aggression, irritability
- Yelling, cursing
- Noncompliant
- Est. are 57% of BI were heavy drinker before injury

| Other Cognitive Issues

- Limited concentration
- Disjointed or poor organizing of thoughts
- Easily confused
- Poor or limited decision making
- Poor or limited judgment

| Morbidity and Mortality

- Morbidity
 - When older adults sustain TBIs, they are more likely to have prolonged recoveries and complications
- Mortality
 - When compared to younger people, older adults who sustain TBIs are at least twice as likely to die

| Older Adults with TBI

- Have more in-hospital procedures, such as neuroimaging and neurosurgery, longer hospital stays, and are more likely to require continued medical care than younger adults (Dams-O'Connor et al., 2013)
- Require more inpatient rehabilitation and make less improvement at one year than younger patients (Livingston et al., 2005; Mosenthal et al., 2004)
- Are more prone to cognitive dysfunction after TBI (Wang et al., 2012)

| Older Adults with TBI (cont.)

- Continue to recover and improve after discharge (Mosenthal et al., 2004)
- Clinicians observe that with adequate resources, timely and appropriate surgical intervention, neuro-intensive care, and aggressive neurorehabilitation, both functional and cognitive outcome of elderly TBI patients can be as good as their younger counterparts (Mak et al., 2012)

| **The Good News!**

- The brain is an amazing organ.
- It has the ability to compensate for damage and find new pathways to allow individuals to adjust after an injury.
- With therapy, proper medication, and supports in place, individuals can live productive lives long after their injury.
- When possible, the aim is to keep individuals living in the setting of their choice understanding that at some point, a higher level of care may be necessary.

| The Adapting Brain



- Unlike a computer, the brain has repair capacity
- Grows new brain cells throughout life
- Dendrite growth continues through 70s
- Extent depends on environment

| Adapting Brain

- Activities of older adults can influence the brain's development
- fMRI study: higher levels of aerobic fitness were linked with greater volume in the Hippocampus, better memory. Erickson 2009
- 40s through the 70s the growth of dendrites can increase
- Dendritic growth might compensate for loss of neurons. Eliasieh et al 2007

ADAPTING BRAIN - NUTRITION

| Foods That Promote Good Brain Chemistry

- Avocado
- Eggs
- Peaches
- Granola
- Grape juice
- Peas
- Sunflower seeds
- Almonds
- Cottage cheese
- Milk
- Shredded wheat
- Soybeans
- Turkey
- Lima beans
- Yogurt

| B-Vitamins

B-vitamins aid in the manufacturing of neurotransmitters important for memory (B1, B12, Folic Acid)

- Low in vitamin B1 can result in:
 - Decreased alertness
 - Decreased reaction time
 - Emotional instability
 - Fatigue
- Low in B12 may cause:
 - Confusion
 - Mental slowness
 - Limb weakness
 - Stammering
 - Psychosis
- Low in Folic acid may cause:
 - Irritability
 - Forgetfulness
 - Mental sluggishness

| B-Vitamins

- Foods rich in B1:

- Bran
- Oatmeal
- Peanuts
- Vegetables
- Wheat

- Foods rich in B12:

- Beef
- Cheese
- Eggs
- Liver
- Milk

- Foods rich in folic acid:

- Cantaloupe
- Carrots
- Dark leafy vegetables
- Whole wheat

| Omega-3 fatty acids

- More than 160 studies about food's affect on the brain were analyzed.
- Omega-3 fatty acids -- found in salmon, walnuts and kiwi fruit -- provided benefits, including improving learning and memory and helping to fight against such mental disorders as depression and mood disorders, schizophrenia, and dementia.
- Omega-3 fatty acids support synaptic plasticity and seem to positively affect the expression of several molecules related to learning and memory.

Adapting Brain: Exercise

| Exercise

- The brain needs oxygen to function
- Exercisers out perform couch potatoes in Long-Term Memory, (not STM) Reasoning, Attention, and Problem Solving
- Exercise “one of the greatest predictors of successful aging” Medina 2008
- Lifetime risk for general dementia is cut in half if you participate in regular exercise
- Aerobic exercise decreases risk of depression and anxiety



Adaptive Brain: Mental Activity

| Adaptive Brain: Mental Activity

- Does participation in mentally challenging activities such as Sudoku or crossword puzzles slow cognitive decline as we age?
 - Research is equivocal, effect is likely minimal
 - Research suggestive: lifetime of challenging mental activity result in more moderate declines in intellectual skills as we age

| **The Home and Community-Based Approach**



The core concepts can be implemented through a variety of services, including Cognitive Rehabilitation Therapy, Physical Therapy, Occupational Therapy, Speech Therapy, Personal Attendant Services, Skilled Nursing, and reinforced by natural supports such as family members and friends.

Barriers to Providing Home and Community-Based Services

- Identifying age appropriate strategies
 - Most likely low tech
 - Simple steps
- Co-existing medical conditions
 - Cognitive effects
 - Physical effects
- Limited supports
 - Lack of family support
 - Social supports have moved or passed away
- Identifying interests
 - Generational gap
 - Finding activities close to home

| Barriers (cont.)

- Regression
 - Due to natural aging
 - One step forward, two steps back
- Changes in medication
 - Physical effects
 - Cognitive effects
- Resistance to change
 - Difficulty accepting feedback
 - Stuck in routine

Core Components to Evidence Based Treatment Planning

- Safety
- Improving communication/socialization skills
- Increasing independence with ADLs
- Identifying health and wellness opportunities
- Addressing psychological and coping skills
- Educating client and natural supports
- Improved quality of life
- Reduce cognitive decline
- Cognitive improvement through compensatory strategies

| Safety

- Mobility in home and community
- Set up of environment
- Cooking
- Emergency preparedness plan
- Knowledge of scams
- Medication

| **Improving Communication/ Socialization Skills**

- Key in preventing social isolation and depression
- Appropriate vs not appropriate topics
- Socialize over the phone
- Socialize in person
- Are they getting out of the house?

| Increasing Independence with ADLs

- Bathing
- Toileting
- Getting dressed
- Cooking meals
- General hygiene
- Household maintenance

Identifying Health and Wellness Opportunities

- Annual checkups with Primary Care Physician
- Walks in the community
- Physical movement programs
- Services coming into the home
- Nutrition options
- Counseling services

Addressing Psychological and Coping Skills

- Addressing/accepting diagnosis
- Loss of self
- Coping with life changes
- Role changes
- Depression
- Anxiety

Educating Client and Natural Supports



- Have they been given any info?
- Where is knowledge level
- Providing education that is appropriate and easy to understand
- Include client and anyone who they may have as a natural support
- Don't assume, ask questions
- Take it slow

| Improved Quality of Life

- Overall engagement
- Enjoyment from daily activities
- Increased level of independence
- Maintaining dignity

| Quality of Life Resource Ideas

- **Education:** caregivers, family, friends
- **Support:** financial-emotional counseling, groups, social involvement
- **Exercise:** keep active, avoid deconditioning, strengthening-stretching-ranging, cognitive-physical-sensory activity
- **Nutrition:** balanced diet, medication review, sleep monitor, sunlight, heart

| Reduce Cognitive Decline

- What is their current cognitive level of functioning?
- What steps are they taking to prevent cognitive decline?
- Ensure daily mental stimulation
 - puzzles
 - reading
 - Social interaction

Cognitive Improvement Through Compensatory Strategies

- Find strategies that are:
 - Relevant
 - Appropriate
 - Cost effective
- Repetition is key
- Stay positive
- Ensure follow through

CASE STUDY

Jane B

Background:

- 70 year old female
- 1 TBI in 2016 resulted from MVA
- Received PT initially following injury for arm fracture
- Did not receive any Cognitive Rehabilitation Therapy until funding was identified in 2018
- Jane was married and has two daughters that live in the area
- She lives independently after her husband passed away prior to her accident
- Jane receives PAS (attendant) services throughout the day and night to ensure her safety and complete needed household chores
- Jane is unable to drive based on recommendations from her doctor; this limits her independence and community engagement
- Jane is unable to use the stove or oven due to safety concerns

| Psychological History

- Diagnosed with depression prior to her injury which has increased following the accident
- Family noted instances of emotional changes and significant mood swings
- Perseverates on not being able to cook due to safety concerns
- Isolated in her home with no routine or structure to her day prior to the start of Cognitive Rehabilitation Therapy services

Cognitive Issues

- Difficulty initiating tasks and task follow through
- Difficulty maintaining focus and sustaining attention during task completion
- Trouble with flexible thinking and developing appropriate solutions to everyday problems
- Limited insight regarding her cognitive deficits
- Difficulty with short-term memory and recall
- Issues with addressing ongoing feelings of frustration and sadness
- Difficulty with sequencing tasks

| Potential Barriers/Challenges



- Limited supports: husband passed away and daughters have limited availability to provide support
- Lack of awareness of deficits and their impact on day to day life
- General resistance to presented strategies
- Lack of motivation
- Limited access to community
- Some safety concerns both in the home and out in the community

Jane's Goals at the Start of Services



- Develop a structured daily routine that includes household tasks and enjoyable activities.
- Identify when to use coping skills to reduce frustration.
- Utilize a calendar system to improve daily orientation.
- Identify at least 2 potential solutions to problems encountered to strengthen flexible thinking and problem solving skills
- Consistently implement memory strategies to assist with recall of important information.
- Self-advocate for transportation needs.
- Consistently implement divided and sustained attention strategies.
- Consistently utilize strategies to follow multi-step directions.
- Developing and implementing safety guidelines when using the stovetop/oven.

Jane's Goals After One Year of CRT Services



- Use monthly budgeting sheet to log income and expenses.
- Review planner on a daily basis to monitor weekly appointments and events.
- Complete 100% of initiated tasks.
- Role-playing unfamiliar scenarios to improve problem solving skills.
- Use the Notes application on her phone to document important information for future recall.
- Prepare 3 healthy meals per week by utilizing kitchen safety precautions.
- Independently schedule paratransit ride 24 hours before planned appointment/outing.
- Role-playing language to use and steps that need to be taken when receiving potential scam phone calls.

| **Future Possibilities for Jane**

- Continuing to live in home/community of choice
 - Safety
 - Downsize to a smaller space
- Increased management skills for finances
- Working towards driving again
- Increased social engagement within her community
- Development of a light exercise routine to promote a healthy lifestyle
- Volunteer at local church

Conclusion

- Many challenges in aging with a brain injury
- It is important to understanding existing problems within this population
- Evidence-based data is out there to support the benefits of remaining in the home and community when possible
- Be aware of what barriers exist and how to address them
- Be in tune with the key components to evidence-based treatment planning
- Additional lifestyle factors have an impact on aging including nutrition, exercise, mental health, sleep, and safety
- Keep the approach person centered

| Questions?



Thank You!

Sarah Fischer MS, CRC, CBIS
Program Coordinator

Mark Cola CBIS, CDP
Director, Business Development

NeuroRestorative Pennsylvania
668 Exton Commons
Exton, PA 19314
(800)743-6802
neuroinfo@neurorestorative.com
neurorestorative.com