The Keys to Driving Post TBI

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Objectives
- Understand the need for drivers rehabilitation following brain injury.
- Understand the skills impacted by traumatic brain injury that are needed for safe driving.
- Understand the evaluation and treatment methods available for people with traumatic brain injuries.

Statistics
- 1.7 Million people sustain TBIs each year in the USA
- More than 500 new incidents occur in Ingham, Eaton, and Clinton counties each year
- 1 in 5 returning military members.
- 40-80% of individuals with TBI resume driving regardless of receiving evaluation, treatments, or recommendations from a professional.
- Research has proved that those individuals with TBIs are more at risk of causing accidents.

Cognition
- Information Processing Speed
- Attention/Concentration
- Safety Awareness
- Anticipation of Hazards
- Following Directions
- Planning/Organizing
- Decision Making/Impulsivity
- Problem Solving
- Orientation
- person, place, time, situation
- vehicle
- community
- Deficit Awareness
- Memory
- Road Sign Recognition
- Map Reading
- Rules of the Road
- Judgment
- Mental Tracking
- Mental Endurance
- Sequencing
- Cause and Effect

Perception
- Basic Visual Skills
- Acuity, visual fields, color vision, size and shape discrimination, depth perception, accommodation, saccades, pursuit, light sensitivity, etc.
- Visual attention
- Visual anchoring/ scanning
- Visual sequencing
- Visual matching
- Figure ground perception
- Visual closure
- Visual information processing speed
- Visual organization
- Visual memory
- Proprioception
- Hearing
- Vestibular function
- Tactile sensation
- Stereognosis

Motor Skills
- Range of Motion
- Fine Motor Coordination
- Eye-Hand Coordination
- Bilateral Coordination
- Strength
- Motor Planning
- Motor Control
- Motor Sequencing
- Eye-Hand Reaction Time
- Eye-Foot Reaction Time
- Physical Endurance
- Independent use of hands
Psychosocial Skills

- Frustration tolerance
- Anxiety
- PTSD
- Emotional stability

Evaluation

- Subjective information
  - Client and caregiver questionnaires
- Clinical evaluation
  - Vision Screen
  - Cancellation of H
  - Alternating Dot-to-Dot
  - Symbol Digit Modalities Test
  - Other
    - DTVP, MSRT, UFOV, TOMAL, etc.

Evaluation Cont.

- Assessment of Driving knowledge
  - What Every Novice Driver Must Know
  - Road Signs
- Functional Evaluation
  - Road course with the Global Electric Motorcar (GEM)
  - Driving Simulation
  - Behind the Wheel Evaluation

Treatment

- Remedial Approach: Selecting functional activities to target and improve specific deficit areas (performance components)
  - Computer based tasks, iPad tasks, tabletop exercises, etc.
- Compensatory Approach: Utilizing remaining abilities to achieve the highest level of functioning possible
  - Active passenger activity, Driving simulations, and GEM vehicle activities
    - Alter the task method
    - Adapt the task objects or use assistive devices
    - Modify the task environment

Outcomes

- Medical restriction from driving
- Return to driving without restrictions
- Return to driving with restrictions
  - No-night driving
  - No heavy traffic
  - Reduced distractions
  - No poor weather
  - Setting a radius from home

Legal Responsibilities

Visual Acuity
- 20/20 to 20/40 - Legal to drive unrestricted
- 20/50-20/70 - Legal to drive with restrictions
- Less than 20/70 - Not a candidate to drive (possibly with biopic lenses)

Sensory driving
- 6 month medical restriction from driving
- 12 month medical restriction for commercial driver license

 Peripheral Vision
- 180 degrees to 110 degrees - Legal to drive unrestricted
- 110 degrees to 30 degrees - Legal to drive with restrictions
- Less than 30 degrees - Not a candidate to drive.
Legal Responsibilities Cont.

- CPM evaluation. Subjective difficulties with fatigue, concentration, processing speed, and memory.
- Driving evaluation and cognitive, perceptual, motor (CPM) evaluation. Subjective difficulties with fatigue, concentration, processing speed, and memory.

Case Study 1

37 year old female involved in a rollover MVA. Decreased level of consciousness due to traumatic brain injury and medications with ventilator assistance needed. Left frontal hematoma identified with a diagnosis of mild traumatic brain injury. 58 day hospitalization with comprehensive services following brain injury. 57 year old female involved in a rollover MVA. Decreased level of consciousness due to a severe traumatic brain injury. 58 day hospitalization with comprehensive services following brain injury.

- Treatment
  - Remedial exercises via the iPad
  - Tap the Frog, Temple Run
  - Driving Simulation
  - Lane keeping, Functional Object Detection, Combined Controls,突发, Speed control, Traffic, Following Distance, Town and Country, Residential and Suburban, City and Highway

- Active Passenger Activity
  - Hazard identification, sign identification, sequencing in construction, at intersections, and for lane movements.

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References


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