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Return to Driving after Traumatic Brain Injury

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Mild Brain Injury

Characteristic Symptoms

- Headache
- Dizziness or vertigo
- Poor balance
- Forgetfulness
- Slowed thinking
- Impaired concentration
- Decreased executive function
- Fatigue
- Irritability
- Visual impairment
- Sensitivity to light or noise

Crooks et al. (2007)

Driving Task

Driving Safely requires:

- Planning
- Concentration
- Inhibition of distractors
- Anticipation
- Problem-solving capabilities
- Ability to interpret complex and changing stimuli
- Prompt, effective and calm motor responses

Tamietto et al. (2006)

Return to Driving

- About 50% of survivors of TBI resume driving
- Nearly two thirds do so without specific medico-legal examination or formal evaluation.
- One study reported that the risk of car accidents was more accurately predicted by measures of patients' awareness of deficits than by measures of physical impairment or low-level perceptive-motor skills. Galski (1990)

Return to Driving

“Drivers with TBI, who completed a comprehensive driving evaluation program after their injury, are able to reintegrate into the driving community with minimal to no difficulties.”

Schultheis et al
(2002)

Compensatory strategies

- Drivers with TBI report lower frequency of engaging in behaviors that may impede their driving capacity
- Some elected to not drive after passing evaluation
- Substantial percentage reported imposing self-limitations on their driving post injury

Return to Driving

- Findings suggest that regardless of patients' perception of themselves or the patients' actual levels of functioning, it is the significant other who determines whether and how much patients will drive. Coleman et al. (2002)
- Rehab professionals can play a role in education regarding patients' ability to master high-level cognitive skills that relate to executive control.

- For many people with TBI there may be more than one barrier to getting back to driving.
 - Physical limitations, paralysis or increased tone
 - Visual disturbances, binocular vision issues
 - Cognitive status, alertness, multitasking
 - Emotional state, ability to handle unexpected situations

Physical Limitations

- Limited use of one or two limbs, usually this is on one side of the body or the other.
 - Consider steering knob for one handed steering
 - Left foot accelerator

Vision Disturbances

- State of CO DMV requirements are 20/40 vision in at least on eye
- Horizontal fields to 85 degrees
- Even if these are met, there may be significant changes in visual perception that will affect driving

Vision Disturbances

- Diplopia is a concern for driving. If you patch one eye to reduce diplopia you are missing a lot of visual information that would help with the driving task.
- Alternating vision. After a TBI some people may have a hard time fusing the image from each eye, if they don't have diplopia they may use one eye at a time. This can cause problems with lane position, backing up, and checking mirrors

Vision Disturbances

- Visual field loss, can be very dangerous particularly if there is any inattention to the side of the loss.
- Light sensitivity and glare recovery
- Recommend a thorough neuro-optometric eye exam and therapy to address visual issues prior to return to driving

Cognitive Status

- Awareness of limitations
- Short term memory
- Divided and selective attention
- Useful field of view
- Distractability
- Study of highway hypnosis and adaptive equipment

Emotional Regulation

- Ability to control your response to unexpected situations
- Anger – test for road rage
- Sleep

When am I ready to complete a comprehensive driver evaluation?

- Once you have finished with Out Patient therapy
- Any vision issues have been addressed
- Your doctor gives you medical clearance to drive

What happens during the Driving Evaluation?

- Clinical evaluation 1-2 hours
 - Visual function including contrast sensitivity and binocular vision
 - Visual motor reaction time
 - Multitasking
 - Useful Field of View
 - Motor and sensory assessment

- Behind the wheel evaluation
 - Driver evaluation vehicle with instructor brake
 - Start in a low challenge environment
 - Increase demands to include the use of executive function skills
 - i.e. Find and pull into a gas station
 - i.e. Drive me to your house from here

- Intervention
 - Specialized driver education
 - Adaptive equipment training
 - Compensatory strategies such as modifying a driving route to avoid left turns, or avoiding driving during peak driving hours
 - Communication of final conclusions to the client's doctor

What can I do to prepare?

- Often a person with TBI is told by their doctor to not drive until cleared to do so.
- You can practice your skills as a passenger with commentary driving.
- Identification of Critical Factors, work on identifying those in a timely manner.

References

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