# Driving after Traumatic Brain Injury

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#### **Course Objectives**

At the end of this presentation, participants should be able to:

- Identify warning signs of potential unsafe driving performance
- Understand the components of a comprehensive driving evaluation
- Understand the basis and process of referral for driving evaluation
- Understand the role of a Driver Rehabilitation Specialist
- Identify a way to locate a Driver Rehabilitation Specialist in their area

# Driving and Community Mobility

- Fundamental for access to healthcare, shopping, recreation, and work
- Goes beyond moving from point A to B; it is emotional & important to our <u>sense of identity</u> & role participation
- Requires a high level of <u>integrated</u> sensory, cognitive, and executive functional performance
- Takes place in a complex, changing environment

Rapport, Bryer and Hanks, 2008 Liddle, Fleming, McKenna, Turpin, Whitelaw, & Allen, 2011 & 2012

#### After surviving TBI...

- Typical goal of rehabilitation is community reintegration
- 40-60% of TBI survivors cease driving after injury
- Most states require certification by an MD of medical fitness after a neurological event like TBI

Rapport, Bryer & Hanks, 2008

### After surviving TBI

- Novak et al. found that 42% of moderate to severe TBI survivors returned to driving in the first year after injury
- That increased to 53% in the 5<sup>th</sup> year

Novak et al., 2010

 One study determined that 28.7% of moderate to severe head injury survivors who returned to driving experienced an accident or ticket and 37.2% experienced some kind of adverse driving incident since their injury

Rapport, Bryer, & Hanks, 2008

- Premature return to driving <u>increases</u> the risks of driving errors/accidents
- Researchers state that those who passed a formal multidisciplinary assessment have accident rates that are comparable to the general population

Lindle et al., 2011

## Warning signs/adverse behaviors

- Impaired judgment
- Risk-taking behaviors
- Fatigue
- Concentration problems

Liddle et al., 2011

 Research determined that <u>unawareness</u> of impairments, even mild ones, increases the risk of accidents or traffic violations (Rapport, Bryer, & Hanks, 2008)

Warning	signs/adverse
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Research by Bottari et al. found:

- Mild TBI survivors reported difficulties with
  - Increased fatigue
  - Vision problems
  - Slowed reactions
  - Headaches
  - Anxiety
  - Loss of driving reflexes (checking blind spot)
  - Decreased anticipation
  - Dizziness
  - Memory

### Warning signs/adverse behaviors

- Concentration problems
- Spatial orientation problems/navigation
- Angering easily
- Pain
- Difficulty with lane position
- Decreased awareness
- Able to compensate through trial and error (!!!)

Bottari et al., 2012

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### Combat vets vs. general population

- MVAs are primary cause of death among vets during their first years after returning from combat
- When compared, they demo'd impairment in executive functions (decision making, judgment, problem-solving)
- 50% had depth perception impairments, 11% had impaired contrast sensitivity
- This led to more speed regulation and adjustment-tostimuli errors than control group in the driver simulator

Classen et al., 2011

## Prelude to evaluation of driving

- Information on driving needs to be more thorough:
- Individual recovery/performance and its impact on driving
- · Rehab program and goals
- Alternative ways of participating in the community without driving
- Other's experiences in a similar condition
- How to adapt roles and activities without driving
- The legal and safety issues related to driving and transport
- TIMEFRAME

Liddle et al., 2012

#### **Evaluation of driving**

"Survivors who wish to resume driving should be referred for a formal driving evaluation to facilitate valid decision-making about whether to cease or resume driving after TBI" Rapport et al, 2008

- Certified Driver Rehabilitation Specialist (CDRS)
  - Credentials represent those who are highly experienced, on top of recent research, and follow best practices of objective driver evaluation and vehicle modification
  - Only about 350 active CDRS in the US and Canada
- Licensed Driver Instructor/ Driver Rehab. Specialist
- Generalist practitioners in OT, PT, SP, psychology, etc.

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### **Evaluation of driving**

- Difficulties with basic ADLs?
- Insight into deficit areas?
- · Past therapy intervention effectiveness?
- Social support/current alternative transportation?

Refer to a DRS for comprehensive driver evaluation that includes in-clinic and behind-the-wheel evaluations

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- Visual skills and visual perception
- Cognition
  - processing speed
- divided attention
- anticipation
- alertness
- impulsivityflexibility in thinking/generating alternatives
- Reaction time
- Strength and coordination
- On-the-road evaluations- diverse driving situations, distractions, changing environments and conditions

#### Results

- Pass/ Fail
- Marginal- further therapy indicated on specific skills
- Marginal- limit driving environments (i.e. no highway driving)
- Physician involvement
- Reporting to BMV/DMV?


### How to locate a driver evaluator

- Association of Driver Rehabilitation Specialists (ADED)
  - www.driver-ed.org "Locate a Driver Rehabilitation Specialist"
- American Occupational Therapy Association (AOTA)
  - www.aota.org
  - Under link for "Rehabilitation and Disability" http://www.aota.org/Practice/Productive-Aging/Driving.aspx "Search for a Driver Specialist"

#### Summary

- Rehab should address driving from the beginning
- Give clear indicators of progress in relation to driving
- Give clear understanding of possibility of returning to driving (i.e. recovery indicators, assessments needed)
- TIME is needed to recover from TBI- driving should be the last goal achieved!

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