OHSU
PARKINSON
CENTER

Driving in Early-Mid PD

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CENTER OF EXCELLENCE
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Driving

Typical sequence during driving:

1) Perceive and attends to stimulus and interprets what is on the road

2) Using previous driving experiences/memory and current situation, comes up with a plan

3) Executes action

4) Monitors the outcome of the behaviour for potential feedback for subsequent corrective actions


Driving Scenario:
Approaching a roundabout
Option Generation
Possible options: Stop, slow down or proceed through roundabout
Option Selection
No hazards detected so driver decides to proceed
Action Initiation
Driver uses indicator, steering wheel and accelerator to navigate roundabout and then evaluates outcome

PD: Driving

Drivers with PD display challenges with on-road driving skills that require:

- Motor actions
- Trunk and head mobility
- Attention
- Visual perception (especially depth) and scanning
- Memory retrieval
- Rapid decision making

PD: Driving

The **most important predictor** of on-road failure and was **significantly associated** with:

- positioning and maneuvering (especially at low speed)
- adaptation at high speed
- change of direction (left turns and merging)

PD: Driving

Critical impairments in specific driving skills that lead to failure on road or simulator testing:

- problems keeping the car steady on the road at low speed
  - Correlated motor functions

PD: Driving

Critical impairments in specific driving skills that lead to failure on road or simulator testing:

- Speed adaptations at high speed (constantly change their speed according to speed limits, speed of other cars and traffic density)
  - Associated with reduced executive functions ("conductor" of all cognitive skills) and attention

PD: Driving

Critical impairments in specific driving skills that lead to failure on road or simulator testing:

- Left turn maneuvers-considered to be one of the most complex driving skills and main cause of car crashes in older adults
  - Associated with visual scanning, working memory, cognitive inhibition and selective attention

PD: Driving

Assessing the following, can to be predictive of on-road performance:

- Motor reactions
- Functional reach
- Contrast sensitivity
- Visual attention with task switching
- Useful Field of View
- Visual spatial skills

PD: Driving

Things to consider:

- Several studies report when pts pass the in clinic driving assessments, they are fit to drive
- However, pts that fail the in clinic assessments, may have a chance to pass the on road/stimulators assessment due to doing the activity in the context

PD: Driving

Things to consider:

- **Visuospatial dysfunction** is specifically **associated** to **fatigue** and not other aspects of cognition or general cognitive function.

PD: Driving

driving rehabilitation:

- Contextual (On-road and driving simulators) focus on:
  - Vehicle control
  - Speed adaptation
  - Left turns
- Non-contextual (in clinic) focus on:
  - Motor deficits (PT)
  - Executive dysfunction and attention (SLP)
  - Visuospatial impairments and visual scanning (OT)

PD: Driving

Maintaining driving with safe behaviors:

- Eliminate night driving
- Drive during "ON" times
- Do not drive when fatigued
- Do not drive when stressed
- Short durations
- Familiar routes
- Low traffic areas and times
- Limit distraction (No music or radio)
- Side seat driver-verbal and auditory cues

PD: Driving

Maintaining driving with technology:

- Back up, and side view cameras
- Back up, and side radar sensors
- Lane keep-assist
- Adaptive cruise control
- Collision warning system
- Electronic stability control
- Active park assist
- Drowsiness alert
- Adaptive headlights

8 Tech Features That Improve Car Safety

Electronic Stability Control

Slows individual wheels during a turn to keep car on course.

Lane-Keep Assist

Detects lane departure and steers vehicle back into the correct lane.

Adaptive Cruise Control

Monitors the driver-set speed and distance to the vehicle ahead.

Adaptive Headlights

Improve forward illumination based on road conditions.

Collision Warning System

Alerts the driver if a collision is imminent.

Active Park Assist

Helps parallel park the vehicle with no steering from the driver.

360-Degree Camera

Improves visibility when backing up or parking.

Drowsiness Alert

Uses automobile or driver data to indicate when you need a break.

Get help finding your next vehicle at **usaa.com/carbuying.**

PD: Driving

Alternatives to driving:

- Public transportation (Trimet Lift)
- Ride services Lyft, Uber, ride connect
- Family and friends