Role of the Occupational Therapist in Driver Rehabilitation Post-Stroke

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OUTLINE

1. Introduction & background
   • About you, about me
   • Current state of the research

2. Our survey
   • Methods, demographics, referrals
   • Current practices in assessment and intervention
   • Clinician priorities

3. The implications
   • Implications from research and current practices in assessment and intervention
   • Recommendations

4. Wrap-up
   • Next steps moving forward
   • Questions
INTRODUCTION & BACKGROUND

Role of the Occupational Therapist in Driver Rehabilitation Post-Stroke
BEST-PRACTICE GUIDELINES
From the Canadian Stroke Network (2013)

1. **Stop driving for 1 month after stroke**
   Stroke patients should be told by physicians to stop driving for at least one month [Evidence Level C]

2. **Screen for medical fitness to drive after stroke**
   After which, they should be screened for residual sensory, motor and cognitive deficits [Level B] – *how?*

3. **If needed, do a Comprehensive Driving Evaluation (CDE)**
   If deemed appropriate, undergo a specialized assessment of off- and on-road skills generally referred to as a “comprehensive driving evaluation” (CDE) [LEVEL B] – *road readiness ($)?... what about intervention?*

ASSESSMENT RECOMMENDATIONS

Screening return-to-driving after stroke: systematic reviews and meta-analysis

- TMT A/B
- Rey–Osterreith Complex Figure
- UFOV
- No cutoff scores


Devos et al. (2011)
- Reviewed 54 potential tools from 30 studies
- Identified 3 tools with the best predictive validity
  - single effect size (d) >0.8 and significance p<0.003
  - or weighted mean effect (dw) size >0.8 and significance p <0.001
- Included cut-off scores

### Road Sign Recognition

**Cut-off:** < 8.5 out of 12 classified unsafe drivers with an accuracy of 84%

**Stats:** $d_w 1.22; 95\% CI 1.01-1.44, \ p<0.0001$

### Compass

**Cut-off:** < 25 out of 32 classified unsafe drivers with an accuracy of 85%

**Stats:** $d_w 1.06; 95\% CI 0.74-1.39, \ p<0.0001$

### Trail-Making Test B

**Cut-off:** > 90 seconds classified unsafe drivers with an accuracy of 80%

**Stats:** $d_w 0.81; 95\% CI 0.48-1.15, \ p<0.0001$

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Component-based (bottom-up)

Treatment of individual component skills that comprise the driving task

Includes:

- pencil & paper and table-top such as board or card games
- physical activities incorporating environmental scanning or reaction time
- Technology-based activities such as the UFOV and Dynavision

Context-based (top-down)

Focuses on the task-based, contextual treatment of driving

Includes:

- Virtual or simulator-based driving tasks
- Behind-the-wheel, on-road training

Component-based (bottom-up)

Evidence

• No clear evidence for improved on-road performance using a component-based approach
• No clear guidelines to inform which component skills should be targeted and to guide effective activity selection for improving on-road performance using a component-based approach.

Context-based (top-down)

Evidence

• Limited evidence that use of a driving simulator may improve visuocognitive skills related to driving
• No clear evidence of improved on-road performance

OUR STUDY

Role of the Occupational Therapist in Driver Rehabilitation Post-Stroke
Role of the Occupational Therapist in Driver Rehabilitation Post-Stroke

1. Generalists are asked to assess and treat driving as part of their overall stroke care
2. We know what the evidence says (and doesn’t say), so what are clinicians actually doing in practice to address driving (strengths/gaps)?

Study Purpose: To document the current assessment and intervention practices of OTs for the occupation of driving with persons with stroke

Study context: Addressing driving with stroke as part of overall stroke care (across rehabilitation spectrum) vs. in a specialist setting
METHODS
Role of the Occupational Therapist in Driver Rehabilitation Post-Stroke

Survey
Structured interview, from the point of referral, to assessment, intervention and discharge
- Specific tools, strategies, and resources they used
- Share recommendations and gaps in service

Setting
In- and outpatient hospital-based setting
- 3 major hospitals designated as Centres of Excellence in stroke care in Southern Ontario

Population
Occupational Therapists n=14
Demographics to follow
DEMOGRAPHICS

Practice Area
Inpatient  n = 8
Outpatient n = 6
Total n = 14

Gender
Female
In: 8 (100%)
Out: 5 (83%)

Experience
In: 7.6 (4.4)* years with stroke, 6 (4)* driver rehab
Out: 12 (10.1)* years, 7.3 (7.2)* driver rehab

*SD
In Caseload

- # clients, mean 9 (2.6)
- clients with stroke 73% (1.6)
- clients with driving as goal 39% (2.7)

Out Caseload

- # clients, mean 21 (8.8)
- clients with stroke 74% (6.0)
- clients with driving as goal 52% (3.3)
**DEMOGRAPHICS**

Breakdown of practice foci of survey respondents

**Inpatient**
- Priority: assessment
  - Physician referral
    - *i.e., license should be suspended or not?*
  - Client-identified need

**Outpatient**
- Priority: assessment & intervention
  - Assess ‘readiness’ to return to driving
  - Intervention to improve ‘readiness’
    - *i.e. successfully pass an on-road evaluation*
REFERRAL PROCESS

From our survey results

Inpatient
• 18% of referrals specifically identified driving
• ~39%* of clients identified driving as an occupational goal

Outpatient
• 44% of referrals specifically identified driving
• 52%* of clients identified driving as an occupational goal

*estimated from their current caseload

Suggestions
• More information to patients from the physician up-front
• More education about the licensing process
• More information from referral source
• Better flow of information from in- to outpatient
Screening return-to-driving after stroke: current practices
Clinicians identified 14 different standardized screening assessments used by respondents.
Virtual screening assessments used by respondents

- Dynavision
- Simulator/Smart Driver
- Useful Field of View

% Use

Inpatient

Outpatient
Non-standardized screening assessments used by respondents

ASSESSMENT IN PRACTICE
## ASSESSMENT IN PRACTICE

Summary of **most commonly used** screening assessments

<table>
<thead>
<tr>
<th>In-patient</th>
<th>Out-patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor-Free visual perceptual test (MVPT)</td>
<td>100%</td>
</tr>
<tr>
<td>Trail Making Test (TMT)</td>
<td>83%</td>
</tr>
<tr>
<td>MoCA</td>
<td>Simulator</td>
</tr>
<tr>
<td>75%</td>
<td>67%</td>
</tr>
<tr>
<td>ROM</td>
<td>Dynavision</td>
</tr>
<tr>
<td>63%</td>
<td>50%</td>
</tr>
<tr>
<td>UFOV</td>
<td>SDMT / LC</td>
</tr>
<tr>
<td>38%</td>
<td>50%</td>
</tr>
</tbody>
</table>
ASSESSMENT PRIORITIES: INPATIENT

Priorities identified by respondents from inpatient setting

Confirmation

Respondents wanted to know what are the best tools to assess and interpret readiness to drive (i.e., medical fitness to drive)

- “We are guessing right now”
- “Are these assessments appropriate?”
- “Is there anything more valid?”

Consistency

- “I believe the assessment process should be more standardized across the province, for example, what assessments are being completed by different facilities.”
- “[I would like a] General, standardized assessment - catchall (all-in-one) so I wouldn't have to pull all these random assessments together to make up what I think is appropriate.”
ASSESSMENT PRIORITIES: OUTPATIENT

Priorities identified by respondents from outpatient setting

Prediction

- Assessment tools that more accurately predict real-world performance
- “assess behind the wheel before putting them in the vehicle”
- “to have a better understanding of what scores actually mean”

Inform intervention

- “[I want to know] how to translate testing to treatment (i.e. in subsections or identified deficits)”
- “I know they have problems with MoCA but how do I turn that into treatment?”
Interventions

Driving-related interventions: current practices
INTERVENTION ACTIVITIES FOR DRIVING

Inpatient and outpatient intervention strategies identified from the survey

**Tabletop, Technology**
- Evenly used by 75% of in-patient clinicians
  - e.g. scanning, seek and find
- 75%

**Physical Activities**
- e.g. reaction time, foot/pedal and steering wheel handling
- 38%

**Functional Activities**
- e.g. ambulation, look & find and path-finding
- 25%

**Technology**
- Dynavision (67%)
- Simulator (50%)
- iPad (50%)
- Computer (50%)

**Tabletop, Functional**
- Evenly used by 50% of out-patient clinicians
  - e.g. look & find and path-finding
- 50%

**Homework**
- “[They have] limited visits with me, learning has to be ongoing and not stop in therapy”
- 50%

Most common interventions
<table>
<thead>
<tr>
<th></th>
<th>Inpatient</th>
<th>Outpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sessions</td>
<td>3 of 5 sessions per week</td>
<td>2 sessions per week</td>
</tr>
<tr>
<td>Duration</td>
<td>30 minutes per session</td>
<td>40 minutes per session</td>
</tr>
<tr>
<td>Duration</td>
<td>7 weeks</td>
<td>6 weeks</td>
</tr>
</tbody>
</table>

1:1 OT time spent on driving related assessment and intervention
INTERVENTION PRIORITIES: INPATIENT

Intervention priorities identified by inpatient respondents

More direction

- “we don’t really have a specific intervention process for driving”
- “The OTs on our team have identified intervention as an area in need of improvement on our service.”

Multi-contextual intervention

“Intervention is not specifically focused on return to driving. For example, if a client has attention impairments then we will focus on improving attention, but we do not use specific driving related activities, as we do not have the equipment available. Similarly, improving cognition is often not just for driving, but for improving independence with ADLs and IADLs.”
Evidence-based and effective

- The need for evidence-based treatment strategies for addressing driving after stroke
  - “what I'm doing, will it make a difference for driving? Are there activities better related to driving?”
  - “[I want to know] if there were something 'better' - i.e. more related to driving to justify to patient, i.e. clearer connections”.
- More treatment ideas overall

Recommendations

- “having more standardized/uniform treatment plan/approach i.e. for the things you lack here's what you would do”.
- Homework:
  - “the ones that do the work at home are more successful”
RESULTS MEET RESEARCH

Integrating current research with current practices
ASSESSMENT SUMMARY

Linking our survey findings with available evidence addressing driving after stroke

1. Cut-off Scores linking office-based measures to on-road performance
   e.g., < 8.5 on Road Sign Recognition test, < 25/32 on the Compass test, > 90 seconds on the TMT-B
   • However, only TMT B was used by most respondents

2. Certain measures have a relationship with driving after stroke
   • Rey-Osterreith identified by Marshall et al. as predictive of driving after stroke; not used by any respondents in the survey
   • UFOV

3. Predictive & clinically feasible measures needed
   • Going forward: ‘Package’ of standardized, non-standardized and virtual screening measures with predictive validity
   • MVPT (Original version) was considered predictive, and most commonly used, but…
EXAMPLE ➔ THE MVPT: STROKE & DRIVING

Used in some form by 100% of our survey respondents

MVPT-O

- Previously considered highly predictive (Mazer et al, 1998)
- Update from same team (Korner-Bitensky et al, 2000) later found it non-predictive
  - $dw = 0.55, p=0.0004$ (Devos, 2011)

MVPT-3

- Does not require the patient to work in the horizontal field
- Eliminates the ability to assess unilateral visual neglect
- Not used in original or follow-up study on driving – no evidence as a screen for medical fitness to drive


Evidence-based practice - not just one approach!

- Consider a mix of component and contextual intervention
- *Driving theory supports this!*
- Consider the use of a Simulator for context for improving visuocognitive skills

Practice suggestions not (yet) in the research

- Consider the use of technology (iPad, computer, Dynavision…)
- Consider the use of homework activities

Gap in effectiveness of interventions

- Is what we’re doing effective at improving real-world performance?
- Intervention strategy that incorporates current practice and is feasible in a rehab setting – then, test the effectiveness
WRAP-UP ➔ NEXT STEPS
Role of the Occupational Therapist in Driver Rehabilitation Post-Stroke
NEXT STEPS: OUR 2015 COTF PROJECT!

Developing a driver training for persons with stroke - a feasibility (pilot) study

Development

- Develop an evidence-based, practice-informed and theory-based intervention program

Feasibility

- Single-Arm Phase II (pilot) Study
  - Delivery and dosage
  - Content
  - Contextual feasibility
  - Feedback from OTs and participants
  
  *i.e. create something we can test!*

Evaluation

- ? Phase III Effectiveness Study - RCT
  - 1º Effectiveness of the program for real-world on-road performance
    - i.e. pass/fail CDE or ministry
  - 2º Performance in off-road measures
    - i.e. tie back to the assessments we're doing in clinic so we know when people are 'ready'

Education

- Refine, share, ENABLE!
THANK YOU!

Any Questions?
REFERENCES


