Should my Patient Drive After a Stroke?

December 11, 2010

Dr. Rick McMillan
Physical Medicine and Rehabilitation
St. Catharines, Ontario
Objectives

• To be more comfortable in recognizing signs of unsafe driving, and making assessments under current guidelines.
• To be better equipped to discuss what patients need to know.
• To be able to effectively recommend rehabilitation strategies to improve driving abilities.
Outline

• Physician’s Role
• The Decision!
  • TIA
  • Stroke
    – Vision
    – Seizure
    – Aneurysm
    – Cognition
• Rehab Strategies
• Case Studies
• In Summary
Independence

• Driving consists of several complex tasks
  • Vision
  • Cognition – attention, memory
  • Physical Function

• “A significant marker of independence”
Independence

• Stroke can disrupt one’s ability to drive
  • Easier decision
    – Hemiplegia or Homonymous hemianopsia
  • More difficult decision
    – Slight cognitive difficulties – judgment

• Ontario – reporting mandatory
What is the Doctor’s Role?

• “Physicians have a statutory duty to report patients whom they believe to be unfit to drive.”
• “…physicians should err on the side of reporting any potentially unfit driver.”

CMA Driver’s Guide
What is the Doctor’s Role?

• “…only motor vehicle licensing authorities can suspend or restrict a person’s license.”
The Decision

• Based on:
  – History
  – Physical Examination
    • Most likely not included:
      » Visual perception
      » Problem solving
      » Memory
      » Visual attention
  – Therapist’s testing results
    » Occupational Therapy
  – Road Test?

• Few guidelines or specific tools
The Decision

• GP’s were able to predict the results of an on-road test in only 56% of patients (Lincoln et al. 1993) while a multidisciplinary neurological team was able to evaluate driving ability reliably (Heikkila et al. 1999)
I want to return Driving

• “Most normal, driving, adults believe that they are much better drivers than they are.”

• Self regulate to reduce driving exposure
  • Increased carefulness
  • Driving shorter distances
  • Reduced frequency
  • Not driving at night or busy times
  • Not driving in bad weather
I want to return Driving

• I will only drive to the store!

• “…little evidence demonstrating that restricted licensing improves driving after a stroke.”
Stroke Recovery

- Fastest recovery first 6 weeks
- Majority of improvement 3 – 6 months
- Proximal to distal recovery
- Upper extremity weakness
- Homonymous hemianopsia / Neglect
Happen Again?

• Substantial risk immediately after event

• TIA
  • 5% risk in 48 hours
  • 8% risk at 1 month
  • 17.3% risk at 3 months
  • 30% risk at 5 years

• Stroke
  • 25% risk of second stroke in 5 years

Preventstroke.ca
TIA

• Not to drive until “medical assessment complete”
• Stroke Prevention Clinic
  – Investigations
  – Management of risk factors

CMA Driver’s Guide
Stroke

- Right hemispheric
  - Insight
  - Judgment
  - Perceptual skills

- Left hemispheric
  - Aphasia
    - Not an absolute contraindication to safe driving

CMA Driver’s Guide
Stroke

• Requires assessment by physician

  • Resume driving if functionally able
  • No obvious risk of sudden recurrence
  • Underlying cause identified
  • Not to drive until at least 1 month passes
Vision

• Immediate Contraindications to driving:

  • Visual acuity – corrected vision less than 20/50 with both eyes open

  • Visual fields – less than 120° along the horizontal meridian and 15° continuous above and below fixation.

  CMA Driver’s Guide
Vision

• *Diplopia within the central 40° of the visual field (ie. 20° to the left, above and below fixation)*

• *Recent functional change from binocular to monocular vision, including temporary patching of eye*
Vision

• “A driver who has recently lost an eye or lost the use of stereopsis may require a few months to recover the ability to judge distance accurately.”

CMA Driver’s Guide
Vision

• If suspected visual concern:
  • Notify Ministry of Transportation
  • Refer to Ophthalmologist or Optometrist for further assessment
  • “…only motor vehicle licensing authorities can suspend or restrict a person’s license.”

CMA Driver’s Guide
Seizure

• 10% of stroke patients will have a seizure in the first 2 years after a stroke.

• 24% incidence of a seizure immediately after a subarachnoid hemorrhage (SAH)
Seizure

• “Any seizure is grounds for immediate cessation of all driving activities.”
• “Resumption of driving will depend on neurologic assessment of the patient…”
• “Individual circumstances may warrant prolonging or reducing the time period suggested.”

CMA Driver’s Guide
Seizure

- **Withdrawal of medication**
  - “…Seizure free for 3 months”

- **Post Traumatic seizure**
  - “… not drive for at least 3 months and not until complete neurologic evaluation, including EEG…appropriate brain imaging has been carried out.”

CMA Driver’s Guide
Aneurysm

• Symptomatic untreated aneurysm
  – Unable to drive

• After surgical treatment
  – Symptom free for 3 months
Cognition

• Insight, judgment, memory, attention, concentration, perception

• “5% of all people greater than 65 will have vascular cognitive impairment”
Cognition

• 2/3 of all stroke patients will have some form of cognitive impairment or decline

• 1/3 of stroke patients develop dementia
  • 10x greater risk after stroke

ebrsr.com
What to do?

• If the medical doctor is unsure of the driver’s abilities ?????

  – Notify the Ministry of Transportation
    • Let them decide.
Returning to Driving

- Stroke Rehabilitation Program
  - Multi-disciplinary team
    - Occupational Therapist, Physical Therapist, Speech Language Pathologist, Social Worker
  - Evaluation and therapy
    - Hemiplegia
    - Perception, judgment, attention, memory
    - Aphasia
  - Driving simulator
    » Judgment
    » Problem solving
Testing

• Ideally a 2-Step Process
  – Screened first for readiness to participate in an on-road evaluation
  – Confidence
  – Financial ramifications
Testing

• Many paper and pencil tests
  • Look at basic skills
  • Try to predict how one would perform on road test

• Perception
  • depth, distances, speeds

• Attention
  • being able to focus, quickly shifting attention

• Judgment and Problem-solving

• Reaction time
  • making quick decisions

OT Driving Protocol
Testing

• Rey-Osterreith complex figure design
  • Complicated line drawing

• Useful Field of View Test
  • Field of vision one can process rapidly presented visual information
  • Central vision, divided attention, selective attention

• Reaction Time
Testing

• Motor-Free Visual Perception Test (MVPT)
• Trail Making Tests A and B
• Road knowledge (road sign and hazard recognition tests)
MVPT

- Perceptual test
- Independent of motor function
- Less than or equal to 30/36
  - Client 8.7x more likely to fail on-road test
  + poor performance on the Trail Making Test
  B 22x more likely to fail

OT Driving Protocol
Trail Making Tests A & B

• Visual motor tracking
• Executive function
• Test A – connect series of numbers
• Test B – connect numbers and letters
• Greater than or equal to 150 seconds on Trail B test
  – Increased risk of crash

OT Driving Protocol
Road Test Questionnaire

• Judgment, reasoning, and safety
• Insight
  – Perceived performance
Returning to Driving

• “Some combination of off road (neuropsychological assessment) and on road testing would provide the more accurate prediction of driving ability (Akinwuntan et al. 2002, Akinwuntan et al. 2007).”

CMA Driver’s Guide
ULTIMATELY!!!!

• If COGNITIVE TESTING is unclear or there are any PHYSICAL CONCERNS:  

**DRIVING ASSESSMENT CENTER?**

OT Driving Protocol
Returning to Driving

• Ministry of Transportation
  • Reinstate license
  • Driving School
  • 3 part test
    – Multiple choice
    – Eye test
    – Short road test
    – $75
  • On-Road evaluation
    – $500

OT Driving Protocol
In Summary

- Driving consists of several complex tasks
- Stroke can affect cognition, vision, and/or motor function
- Notify the ministry if you “feel patient is medically unfit to drive”.
- Some patients have the ability to return driving after a stroke
- Rehabilitation services, on-road driving evaluation, formal driving test can all be helpful in making the final decision.
Case 1

• CM 75 year old female

• Right hemispheric stroke April 7/10
  • Severe neglect to left
  • Mild weakness left arm and leg
  • Transfer 1-2 people

• Past Medical History
  • Hypertension
  • Atrial fibrillation (on Warfarin)
  • Dyslipidemia
CM

• Do you send a note to the Ministry of Transportation?
  • She tells you she will not drive until she is cleared by you.
CM

• If a note was sent, what could be done to get her license reinstated?
Case 2

- JB 62 year old female
- Left sided small subdural hematoma
  - December 12, 2009
  - Seizure in hospital
- Past Medical History
  - Hypertension
  - Diabetes
JB

- Do you send a note to the Ministry of Transportation?
  - It was just one seizure!!!
  - She only had a small bleed
JB

• 9 months later
• Still on Phenytoin 300mg at night
• On Examination
  • Walks no aids
  • Vision good
  • No weakness
  • No further seizures
  • Cognitively intact
JB

- Wants to return driving
- Does she need to wait 1 full year?
- Can you do anything to get her license back sooner?
- Will she need any further investigations?
Seizure

- “Any seizure is grounds for immediate cessation of all driving activities.”
- “Resumption of driving will depend on neurologic assessment of the patient…”
- “Individual circumstances may warrant prolonging or reducing the time period suggested.”

CMA Driver’s Guide
Seizure

- **Withdrawal of medication**
  - “…Seizure free for 3 months”

- **Post Traumatic seizure**
  - “… not drive for at least 3 months and not until complete neurologic evaluation, including EEG…appropriate brain imaging has been carried out.”
Case 3

• JC 78 year old male
• Left hemispheric stroke Jan 29/2010
• Past Medical History
  – Coronary artery disease
  – Myocardial infarction x two
  – Dyslipidemia
  – Type II Diabetes
  – Hypertension
  – Knee Osteoarthritis
  – Previous Prostate Cancer
JC

• On Examination
  • Mild right sided weakness
  • Walks with single point cane
    – Decreased balance
  • Cognitive difficulties
    » Moderate impairment of memory
    » Decreased visual processing
    » Limited mental flexibility
    » MVPT 27/36
JC

- Do you send a note?
- Do you wait until he has finished his rehabilitation?
JC

- 6 months later
  - Outpatient therapy completed
  - On follow-up testing, occupational therapist not optimistic

- Vision cleared by Optometrist

- Seen by Geriatrician
  - Patient feels that he is functioning at 80% of normal
  - AB Cognitive Screen (ABCS) 48/100 (mild cognitive impairment)
ABCS

• Short screening tool
• 5 domains
  – Orientation, registration, clock drawing, delayed recall, word fluency
• Differentiate between normal cognition and mild cognitive impairment (MCI)
• Less influenced by education than the Standardized Mini-Mental State Examination (SMMSE)

Molloy et al., 2005
JC

- Patient wants to return driving
- Based on testing results what do you suggest?
In Summary

• Driving consists of several complex tasks
• Stroke can affect cognition, vision, and/or motor function
• Notify the ministry if “feel patient is medically unfit to drive”.
• Some patients have the ability to return driving after a stroke
• Rehabilitation services, on-road driving evaluation, formal driving test can all be helpful in making the final decision.
References

  • ebrsr.com

• CMA Driver’s Guide
  • Determining Medical Fitness to Operate Motor Vehicles. 7th edition, 2006.

• Preventstroke.ca


SEE WHAT HAPPENS WHEN YOU PUT YOUR HEART INTO IT.™

visit www.heartandstroke.ca