Driving and Disability: the road to safer travel

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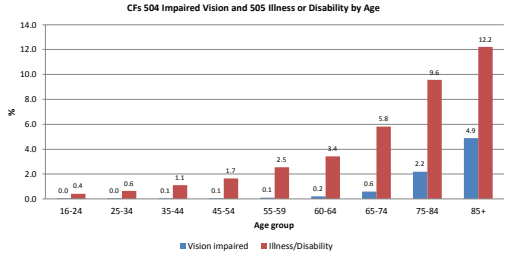
Why is this important?

- We are a nation of drivers
- Public transport is poor, often unreliable, infrequent especially in rural areas.
- Medical conditions and some medications can affect the ability to drive safely
- No statistics on accidents caused by medical conditions but are indications from road collision data that illness, disability and visual impairment contribute to road accidents.
- Stats19: police forces collect data on accidents where someone has been injured (killed, serious injury or slight) doesn't include damage only accidents.
- Police judgement, not able to test at roadside: Under reported

Stats19 Factors contributing (CFs) to road accidents:

% based on total number of police-reported injury collisions between 2006-2013 (n=896,444)



Hawley, Roberts, Fosdick (2015) Visual impairment and Road Safety: Analysis of UK Road Casualties and Contributory Factors. College of Optometrists, London.

Presentation Outline

- Medical aspects of fitness to drive – driving rules and the role of health professionals
- National guidelines on fitness to drive after brain injury
- Driving after brain injury or other neurological condition
- Older drivers
- Screening tools and driving assessments
- Adaptations and alternatives to driving

UK Fitness to drive (FTD), who decides?

- 48.8 million licence holders (DVLA, 2019)
- 92% of the adult population (ONS 2019)

- No licence renewal needed until age 70
- Onus on driver to decide to restrict or cease driving
- Driver is obliged to declare any medical condition which may affect driving. But do they know this?
- Many drivers self-regulate their driving
- DirectGov website clearly advises drivers to ask a health professional for advice on FTD

Health Professionals

- Health professionals (HP) = DVLA guidance particularly aimed at Doctors, Optometrists and to a lesser extent Occupational Therapists – but all Rehab Team should be aware
- Should advise their patients whether they should notify DVLA and if they should stop driving.
- If patient refuses, then HP may disclose medical information to DVLA in confidence and write to patient informing them of this.www.dvla.gov.uk
- Other countries differ – some US states and Canadian provinces have mandatory reporting for physicians.

USA: American Academy of Neurology Position Statement on Physician Reporting of Medical Conditions That May Affect Driving Competence

- Driving laws for individuals with relevant medical conditions vary greatly from state to state.
- Current or would-be drivers with medical conditions of interest are expected to disclose their condition to the state Department of Motor Vehicles (DMV) and to obtain a physician's note to confirm their fitness to drive.
- On a discretionary or mandatory basis, a physician may be obligated to report a patient to the DMV when that patient's medical condition makes driving a hazardous proposition.
- According to the Epilepsy Foundation, six states currently have some form of mandatory-reporting law in place (California, Delaware, Nevada, New Jersey, Oregon, and Pennsylvania) for various medical conditions.
- Most states, however, give physicians the discretion to choose whether to report a patient whose condition requires additional consideration by a state driving official.

South Australia

- All drivers are required by law to report any medical condition that could affect their ability to drive safely. This must be done at the time the condition occurs.
- Health practitioners are also required to report if a patient is diagnosed with a medical condition that may affect their ability to drive.
- The Registrar of Motor Vehicles (RMV) has a legal duty to ensure that the holder of a driver's licence is medically fit to drive a motor vehicle with safety.
- While the responsibility for the issue or retention of a driver's licence rests with the RMV, it relies heavily on the advice provided by health professionals.
- Medical driving fitness must be assessed using national standards and guidelines. "Assessing Fitness to Drive – Commercial and Private Vehicles Drivers" (2012)

Canada: College of Physicians and Surgeons of Ontario, Canada

- Lists 'high risk' medical conditions that warrant a licence suspension:
- For these conditions it is **mandatory** for physicians, optometrists, occupational therapists and nurse practitioners to report their patients to the Ministry of Transportation. (since 2018)
- Health professionals now also now have discretion to report other medical conditions, functional and visual impairments that may make it dangerous for a patient to drive and which are not covered in the prescribed list for mandatory reporting
- While it is not necessary to obtain a patient's consent before making a report under the *Highway Traffic Act*, where appropriate, the College encourages physicians to inform the patient in advance of doing so. In circumstances where the patient was not informed beforehand, the College recommends that physicians do so after the report has been made. http://www.mto.gov.on.ca/english/safety/medically-unfit-driver-physicians.shtml
- Canadian Medical Association, Determining Medical Fitness to Drive: A Guide for Physicians, 9th Edition (CMA, 2018).

UK Role of Health Professionals (DVLA, 2019)

- *The driver is legally responsible for informing DVLA about any medical condition which may affect safe driving.*
- "Doctors owe a duty of confidentiality to their patients, but they also have a wider duty to protect and promote the health of patients and the public. This explanatory guidance sets out the steps doctors should take if a patient's failure or refusal to stop driving exposes others to a risk of death or serious harm."

Doctors and other healthcare professionals should: (DVLA, 2019)

- ■ advise the individual on the impact of their medical condition for safe driving ability
- ■ advise the individual on their legal requirement to notify the DVLA of any relevant condition
- ■ treat, manage and monitor the individual's condition with ongoing consideration of their fitness to drive
- ■ notify the DVLA when fitness to drive requires notification but an individual cannot or will not notify the DVLA themselves.
- **"Of course, this last obligation on professionals may pose a challenge to issues of consent and the relationship between patient and healthcare professional. The GMC and The College of Optometrists offer guidance on this** which is summarised below."

Later: how this works in practice…

What if patients ignore advice?

- "You can be fined up to £1,000 if you do not tell DVLA about a medical condition that affects your driving. You may be prosecuted if you're involved in an accident as a result." (Gov.UK, 2019)
- "Patients must be reminded that if they choose to ignore medical advice to stop driving this may affect their insurance cover. Doctors are advised to *formally and clearly document the advice given*." (DVLA, 2019)
- The DVLA is solely reliant on doctors and other healthcare professionals for the provision of medical information.

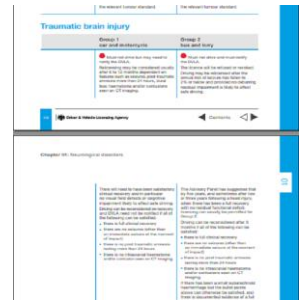
Professional Drivers – Higher medical standards for HGV/PSV

- Professional drivers e.g. HGV, PSV
- From age 45 need to complete a D4 medical and visual report every 5 years.
- Medical examination with a DVLA approved doctor

- Taxi drivers – depends on Local Authority
- "You might need to pass the Driver and Vehicle Standards Agency (DVSA) taxi assessment to drive a taxi or private hire vehicle (PHV) - contact your local council to find out if you need to." (Gov.uk)
- No specific medical standards

- Delivery drivers (van drivers) – Depends on employers
- No specific medical standards

Medical Standards of Fitness to Drive Group 1 (e.g. car) and Group 2 (professional)



Tragic outcome after undisclosed medical condition

- 'The six deaths in the Glasgow bin lorry crash could have been avoided had proper precautions been taken over the driver's health.'
- 'Mr Clarke should have disclosed his history of blackouts.'
- 'Better checks from doctors, and Mr Clarke's current and past employers, could have shown he was unfit to drive a bin lorry.'
- 'He did not fully disclose this incident to his own doctors, the Driver and Vehicle Licensing Agency (DVLA) or on application forms or medical declarations for council jobs.'
- **'If Mr Clarke's blackout at the wheel of a bus in April 2010 had been handled differently by doctors, the crash also may have been prevented.'**

Glasgow Bin Lorry Crash Dec 2014 (image Daily Star)

BBC News report of Fatal Accident Inquiry August 2015

UK licensing system largely depends on the honesty of the driver

- "*If you hold an HGV licence; your job depends on that licence, you are not going to give your job up lightly, some [patients] will then hawk that round to a doctor that hasn't got your full medical knowledge, to whoever doesn't know.*" British Medical Association (BMA) Representative and GP. Focus Group (Hawley, 2010)
- Glasgow tragedy triggered GMC re-issuing advice to physicians

Safe driving requires multiple attributes

- Vision
- Visuospatial perception
- Hearing
- Attention and concentration
- Memory
- Insight and understanding
- Judgement
- Adaptive strategies
- Good reaction time
- Planning and organisation
- Ability to self-monitor
- Sensation
- Muscle power and control
- Coordination

Neurological conditions can affect all

Relative risks of accident involvement of medical conditions: Results of a meta analysis (Vaa, 2003)

Neurological conditions carry a 75% higher than average risk, second only to alcoholism

Main category	*Relative risk*	*95% CI*	*p-value*	***Number of results*
Vision impairment	1,09*	(1,04; 1,15)	0.000	79
Hearing impairment	1,19*	(1,02; 1,40)	0.649	5
Arthritis/Locomotor disability	1,17*	(1,004; 1,36)	0.002	12
Cardiovascular diseases	1,23*	(1,09; 1,38)	0.000	48
Diabetes mellitus	1,56*	(1,31; 1,86)	0.000	25
Neurological disease	**1,75***	**(1,61; 1,89)**	**0.000**	**22**
Mental disorders	1,72*	(1,48; 1,99)	0.000	33
Alcoholism	2,00*	(1,89; 2,12)	0.210	3
Drugs and medicines	1,58*	(1,45; 1;73)	0.000	68
Renal disorders	0,87	(0,54; 1,34)	0.076	3
Weighted average across all categories	1,33*	(1,28; 1,37)	0.000	298

What should health professionals do after patient has a brain injury or neurological condition?

- All HPs should consider if the patient is a driver
- Rehab team should address the issue of return to driving (do not assume someone else has advised)
- Guidelines for clinicians – e.g. DVLA 'At a Glance' Guide (UK), Canadian Medical Association Guidelines
- How useful are these guidelines?
- Are they based on good evidence?

Quality of Guidelines on Medical Aspects of Fitness to Drive

- 2014, team of 18 physicians and researchers from 5 countries assessed the quality of nine national clinical guidelines on driving with medical illness. (Rapoport et al, 2015)

All rated guidelines poorly on:

- Rigour of development
- Applicability
- Editorial independence
- Conclusion: There is considerable variability in the quality of these guidelines

International guidelines: 61 driving recommendations related to Traumatic Brain Injury (TBI)

Chee, Hawley, Charlton et al, 2018

Table 2. Number of Driving Recommendations for TBI from International-National Guidelines

Country	Guideline Title	# Recommendations for TBI
Canada	**CMA**: Canadian Medical Association (8th ed.)	12
	CCMTA: Canadian Council of Motor Transport Administrators	8
USA	**AAMVA**: American Association of Motor Vehicle Administrators	3
	NHTSA AMA: U.S. National Highway Traffic Safety Administration and American Medical Association	7
UK	**DVLA SWANSEA:** Drivers Medical Group, Driver and Vehicle Licensing Agency, Swansea	3
Singapore	**SMA**: Singapore Medical Association	4
Australia	**AUSTROADS**: Austroads and National Transport Commission of Australia	6
	CHARLTON (2010)*: Chronic Medical Conditions and Driving	7
New Zealand	**NZ:** New Zealand Transport Agency	7
Ireland	**RCPI/RSA:** Royal College of Physicians of Ireland and Road Safety Authority	4

*indicates guidelines included in this exercise which are not national guidelines

Traumatic Brain Injury

(Lancet Neurology Commission, 2017)

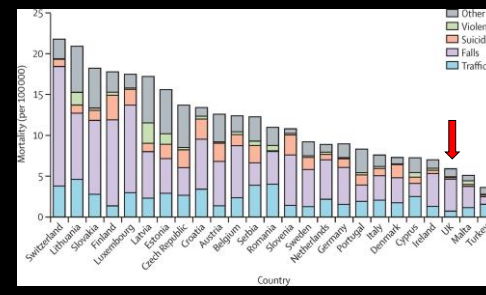
- Worldwide, over 50 million people have a TBI each year, and it is estimated that about half the world's population will have one or more TBIs over their lifetime.
- Incidence rates from population-based studies using broad definitions of TBI = 811–979 per 100,000 people/year.
- The majority of these will be minor injuries.
- Studies using hospital discharge rates report an incidence of 47.5–643·5 per 100,000 people/year
- TBI can be considered a lifelong condition. It may be a major risk factor for late neurodegenerative disorders such as dementia and Parkinson's disease (Wilson et al, 2017)

EPIDEMIOLOGY OF TRAUMATIC BRAIN INJURY

- A global public health and socio-economic problem
  - According to the WHO, TBI will become the third leading cause of death and disability in the world by 2020[1].
- Incidence of TBI is rising around the world
  - Overall incidence rate of 262 per 100,000 per year for TBI patients admitted to hospitals in Europe[2]; in all developed countries, the annual incidence is about 200 per 100,000 admitted[2,3].
- Prevalent in both developed as well as low- and middle-income countries
  - In the US, 5.3 million people (1-2% of the population) have a TBI-related disability[4].
  - In Europe, 7.7 million population surviving brain trauma suffer from disabilities[4].
  - Worldwide, 6 million people die from trauma-related incidents (10% of the world's deaths) with 89% of trauma-related deaths occurring in lower- and middle-income countries[5].

1. The Lancet (2012); 2. Peeters (2015); 3. Popescu (2015); 4. Roozenbeck, 2013; 5. Rubiano (2015).

Age-adjusted mortality rates due to traumatic brain injury in 25 European countries in 2012, by cause of injury



Dr Marek Majdan, PhD, Dominika Plancikova, MSc, Alexandra Brazinova, PhD, Prof Martin Rusnak, PhD, Daan Nieboer, MSc, Prof Valery Feigin, MD, Prof Andrew Maas, MD
Epidemiology of traumatic brain injuries in Europe: a cross-sectional analysis

The Lancet Public Health 2016 1, e76-e83DOI: (10.1016/S2468-2667(16)30017-2)

UK Incidence and Prevalence (Hawley, 2015)

- 401 per 100,000 population of adults (aged 15 - 90+) = Incidence of **hospitalised** head injury patients in England in 2013/14
- (Using Hospital Episode Statistics and ONS population data for England)
- 2317 per 100,000 = Older adults aged ≥80
- Evidence from literature reviews suggests approximately 2% of the population live with a TBI-related disability.
-
- Applied to the UK population as a whole = approximately 1,291,936 people living with a TBI-related disability in 2014.
- **1,063,782** adults (aged 15 – 90+) living with the consequences of TBI. Many will be drivers, were previously drivers, or would-be drivers

DRIVING RISKS AND TBI

- Motor vehicle collisions are predicted to be the 3rd leading cause of disability-adjusted life years lost by 2020[6].
- TBI-related disabilities affect driving skills
  - Deficits associated with TBI include: impaired attention, poor executive function, depression, impulsivity, poor decision-making, aggressive behaviour, etc.[5]
- Post-TBI Driving Risks
  - There is some evidence to suggest that post-TBI drivers have a higher crash rate than non-TBI drivers; and exhibit a higher occurrence of multiple crashes [6,7].
  - While many individuals resume driving after a TBI, many choose not to, and others are no longer able to drive[7].

5. Rubiano (2015); 6. Formisano (2005); 7. Neyens (2012).

Systematic review of Absolute and Relative Risk of Motor Vehicle Collision (MVC) or driving impairment after TBI as measured by on-road testing or driving simulator

- 1. Using the hierarchy of quality of evidence there were no studies ranking 1 or 2a for methodological quality. Most of the data extracted was from self-report – not randomised controlled trials. Also small sample sizes.
- 2. Findings concerning the relationship between TBI and crash risk are inconclusive.
- 3. The odds of being involved in a MVC are higher for participants without a TBI.
- 4. TBI group tended to have fewer traffic violations while driving, such as speeding, compared to healthy controls.
- 5. Participants in the TBI groups tended to be more self-regulating, drive less often and shorter distances, avoiding difficult situations.
- 6. But, participants with TBI consistently performed worse on on-road test assessments and had more problems with vehicle control.

Chee J, Hawley C, Charlton J. et al (2018) J. Head Trauma Rehabilitation 34(1):1

Slow to resolve problems after TBI (Stilwell et al, 1999; Hawley, 2003)

- Memory
- Fatigue
- Attention
- Concentration
- Executive function
- Decision making
- Behaviour/impulse control
- Lack of insight into deficits/limitations
- Visual impairment
- All relevant to driving and patients want to return to driving and normality ASAP (Hawley, 2001; Brooks & Hawley, 2005)

Six Main groups of unfit drivers

1. **Can't see correctly** (visual impairment)
2. **Can't think correctly** (cognitive impairment e.g. Dementia, some neurological conditions)
3. **Can't physically operate a vehicle** (physical disability, frail elderly)
4. **Risk of sudden incapacity** (seizures, hypoglycaemia, cardiac arrhythmias, some neurological conditions)
5. **Mental incapacity** (psychiatric disorders)
6. **Impaired by alcohol, drugs or medication**

Brain injury associated with at least first five

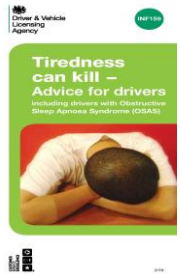
Risk of sudden incapacity

- Blackouts
- Syncope (fainting, sudden loss of consciousness)
- Seizures
- Epilepsy
  - Epileptic attacks are the most frequent medical cause of collapse at the wheel. Epilepsy includes all events: major, minor and auras. (DVLA, 2016)
  - 6 months off driving from the date of first unprovoked seizure. If clinical factors suggest an unacceptably high risk of a further seizure, this will be 12 months off driving from the date of the seizure. Group 1 (DVLA, 2019). Group 2 drivers 5 year driving ban from 1st seizure
- **Brain injury/tumours (increased risk of seizures**)
- Cardiovascular disorders (risk of cardiac arrest)
- Diabetes poorly controlled (risk of Hypoglycaemic attack)
- Stroke/TIA (risk of further stroke/TIA)

Tiredness and Sleepiness

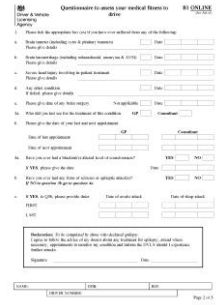
- DVLA leaflet online
- Must tell DVLA if have 'a condition causing sleepiness/tiredness during the day'

- **What about fatigue associated with TBI?**
- Evidence that fatigue is common and persists post TBI



Driving after a brain injury

- You must tell DVLA if you have a traumatic brain injury (Gov.UK, 2019). Use form B1
- Includes consent to GP/Dr being contacted
- You can be fined up to £1,000 if you don't tell DVLA about a medical condition that affects your driving. You may be prosecuted if you're involved in an accident as a result.


Driver & Vehicle Licensing Agency

Questionnaire to assess your medical fitness to drive

B1 ONLINE

Concussion

- In the USA, the CDC estimates that between 1·6 and 3·8 million concussions occur annually. However, this might be a considerable underestimate, as many concussions do not reach medical attention (The Lancet Neurology Commission, 2017)

- DVLA Guidance does not mention concussion

- In Ontario, Canada: "Depending on the severity of the concussion, however, some practitioners may choose to report the condition if they are of the opinion that the person poses a risk while driving," the ministry's statement adds. "Where significant cognitive or motor/sensory impairment is noted, a licence suspension may be issued."
- https://ottawacitizen.com/news/local-news/to-drive-or-not-to-drive-something-to-consider-after-a-concussion

Concussion/Minor Head Injury

- Immediately after an acute concussion, an individual is not fit to drive, and anyone with a concussion is cognitively affected in three areas, which are all relevant to driving (Marshall, 2019):

- 1 Information processing speed, or how quickly they take in information and use it
- 2 Dividing their attention between tasks like checking the speedometer, then looking down the road and refocusing on the rear-view mirror
- 3 Ability to focus

- "**Guess what's really important for driving?"** Marshall says. "**Well, the ability to multi-task and the ability to take in information quickly**. You're moving at 100 km/h. Our bodies weren't made to move at 100 km/h. Information is coming to you, your focal point is changing at 100 km/h. We fully don't understand how much brain power it's using."
- https://ottawacitizen.com/news/local-news/to-drive-or-not-to-drive-something-to-consider-after-a-concussion

So what can a health professional do when a patient has a medical condition which affects driving?

- Advise the patient to notify DVLA
- Advise the patient to cease driving for the appropriate period
- Contact DVLA 'doctor to doctor' if in doubt
- Refer patient to a Mobility Centre for assessment : physical and cognitive
- Refer patients to useful websites

Web resources

- Headway - adults
- https://www.headway.org.uk/about-brain-injury/individuals/practical-issues/driving-after-brain-injury
- Brain Injury Hub – young people
- https://www.braininjuryhub.co.uk/information-library/moving-on-adulthood/driving-after-a-brain-injury-
- Driving Mobility – various conditions
- https://www.drivingmobility.org.uk/

Mobility Centres (Driving Mobility)

www.drivingmobility.org.uk/

Driving Simulators
Assessments
On road drives

Returning to driving after brain injury (Driving Mobility)

- **Following minor head injury, patients are advised not to drive for at least 24 hours post-injury**; refraining from driving until completely recovered is recommended.
- **After "significant brain injury" drivers should cease driving for 6-12 months**, depending on factors such as post-traumatic amnesia and seizures (NB different rules apply for LGV and PCV drivers); there will need to be satisfactory clinical recovery with no visual field defect or cognitive impairment likely to affect safe driving before driving can resume.
- Other forms of acquired brain injury have slightly different rules but if there are lasting impairments that affect driving ability then driving should cease for a period of time. **Because every brain injury is different each case should be considered on an individual basis**.
- "Significant brain injury" is generally judged as that which requires in-patient treatment.
- **Discuss this with your doctor before considering resuming driving.**
- http://www.drivingmobility.org.uk/information/returning-to-driving/returning-to-driving-after-brain-injury/

Returning to driving after brain injury (Driving Mobility, 2019)

- Driving is an important part of your independent lifestyle and integration into the community. Because we take our driving skills for granted, it is easy to forget that driving is the most dangerous thing we do in our everyday lives.
- A brain injury can affect the skills needed to drive safely. If and when you may safely return to driving should be addressed early in recovery. You, your family members and health professionals should all be included in this important decision.
- If anyone has concerns that driving may put you or others in danger, the health professionals may recommend an independent driving assessment.

Health Professionals and Advice on Fitness to Drive Study (Hawley, 2010)

- Department for Transport saw mismatch between notifications to DVLA than would be expected from prevalence of medical conditions.
- Commissioned study to investigate the attitudes of health professionals to advising patients on fitness to drive.
- 1923 participants (1565 HPs, 358 patients)

HPs beliefs and knowledge of FTD (n=630)

- 89% believe giving advice to patients on fitness to drive is important
- 91% believe HPs have a duty of care to give driving advice to patients
- 70% think there is a need for clearer guidelines on FTD
- 60% say their knowledge of Medical Aspects of FTD is fairly poor
- 82% think HPs need more training on FTD

- Whose role is it to give advice? Many say GP

Simulated Consultations
Actor patient : HP takes history

"Lifestyle Advice Study" How would you manage this patient today?

- 3 Medical conditions: 1) Stroke, 2) Diabetes with visual impairment, 3) Depression with alcohol dependence)
- 4 Actors as patients: Male/Female, age 40 or 70
- Real Clinician: Primary/Secondary Care setting
- Plenty of driving clues....
- 200 scenarios shown in pairs to 101 HPs (50 GPs). Told it was a "**Lifestyle Advice Study**".
- Watched the video then interviewed and asked for main concerns, with 9 further prompts.
- 10th prompt = "research shows that there are 5 key areas that patients often ask about: diet, work or hobbies, home, sex, driving…".

How would you advise this patient on their lifestyle?

- Three quarters of HPs did not raise fitness to drive unprompted
- OTs and Optometrists more likely to raise FTD than Doctors
  - "*I'm afraid at the bottom of my agenda would have been to get onto the lifestyle issues at this point*" GP
- One Third of HPs did not raise driving as an issue after 10 prompts.
- Only 20% of interviewees volunteered specific driving *advice*

How do you broach the topic with patients? (GPs)

- **Most wait for patient to raise it**
- "*… I suspect we probably don't unless people actually say 'Can I drive?' ….*" (urban)
- *"If it's a new patient at the clinic I often don't ask them if they drive and probably ignore the issue largely. If it comes up then I will address it, but if it doesn't come up I often don't address it.*" (semi-rural)
- *"In health terms very often you run the risk of seriously impairing the quality of somebody's life. …You have stopped somebody driving and you could see them six months later with depression because you have totally destroyed their life."* (suburban)

Whose role is it to advise?

- *"The GP is the best person because he is the one most likely to see the whole thing …"* (M,GP, urban)
- *It's the primary care team…. they are the ones, we* [GPs] *see the patients five times a year … the General Household Survey shows that.* BMA representative and GP
- *"…for some people you're about to take away their job, their life … It's a breaking bad news barrier but you have got to do it and it's your job.* (M, GP)
- *"it isn't actually by itself a medical issue, it's a social issue and there is a tendency in my view in society to hand the social issues over to the medical profession."* (M, GP)

14 Focus groups with health professional groups

- "*People with dementia just forget what's been enforced anyway, they forget whether they've got a licence or not because they think they've had one all their lives so they must still have one.*" (Psychiatrist)
- "*I think the main problem in our service is that advice isn't offered to people consistently across professional groups.*" (Clinical Psychologist)
- "*As long as you've had the open and frank discussion that you have got to have, I don't think that [*discussing fitness to drive*] would damage my relationship with patients.*" (Practice nurse)
- 'Do you think you have any obligation to advise patients about their fitness to drive?':
- "*Yeah, I think we do. Especially from an OT point of view because a lot of leisure activities that we're looking at, if you're looking at someone's perception and cognition as well it is usually us that are picking that up. We probably are likely to pick up a lot more things related to driving than most other professionals would.*" (Occupational therapist)

Key barriers to giving FTD advice (GP focus group)

- breaking bad news
- not considering fitness to drive as an issue within the clinical context
- not remembering to discuss driving with patients
- assuming that older patients are not drivers
- patient resistance or denial
- concern for the effects of not driving on patient well-being or livelihood, mobility around neighbourhood
- concern that advising a patient to stop driving may adversely affect the clinician-patient relationship

Key Facilitators to giving advice (GPs)

- Patients raising the issue of driving themselves
- Using the DVLA guidelines to convince patients of the regulations regarding their fitness to drive
- Access to a mobility centre to which patients can be referred for a driving assessment
- If there were in-office tests GPs could use to assess FTD
- Restricted licensing: more comfortable restricting than banning driving

Patient Focus Group

- Several people said that they limited their own driving, but concern that other patients might not do so.
- *You have to be independent, so I limit my driving, I drive to locally wherever I want to go, so to the hospital, to wherever I want to go, but there are journeys that I would never make, I would never drive into Birmingham, motorways and things like that.* Person with head injury, focus group 6.
- *At no point nobody has ever given me any information or any advice on whether I should return back to driving, ... I do sessions at the rehab centre where I went through and there's countless numbers of people that don't even inform the DVLA, they just go back and they just drive and it frightens me because I know returning to driving was the hardest thing I've ever done since the stroke.* Person after stroke, focus group 6.

Head Injury: return to driving advice

- No advice:
- *'I didn't worry about it, I just stepped out and got in the car and drove. 'Nobody reacted, my wife didn't react, the kids didn't react.'*
- Interviewer: 'so everybody thought it was quite a normal thing to do?'
- *"Yeah, …I am quite surprised that after such a massive injury that you can just walk out of the front door and get in the car…'* Person with TBI.
- *"We had no advice from anyone, no-one mentioned it. No, we didn't tell the DVLA, had no idea we should do. He was less confident and he didn't drive alone at first, I was always in the car with him, and he only made short familiar journeys. He's still not a confident driver and only drives when he has to."* Wife of person with TBI.
- *"I don't recall any advice. After my head injury my husband does most of the driving, but he has an eye condition. Between us we make one good driver"*. Person with TBI.
- Ignored DVLA advice:
- *"I had to drive illegally because the DVLA wouldn't give me my licence back."*

Head Injury: Lack of insight

- *"I don't remember the accident… because of the coma. I have no fear and feel very confident on a motorbike. … But my family would kill me if I got on one again."* Male, returned to driving 6 months after his head injury.
- *"Straight out of hospital after 17 weeks I felt able to drive, but the doctor stopped me and banned me from driving for 12 months. I said to my wife, 'I'm going to ignore him and drive', but she threatened to leave me if I drove, she's an occupational therapist, so I stopped.*
-
- *"No-one suggested I tell the DVLA though so I didn't. I started driving again a year later, I had an informal driving assessment at a driving school, arranged by my wife. If I had lived alone I probably would have driven."*
- His wife reported a lack of insight into his limitations.

Recent interest in fitness to drive, especially among older drivers

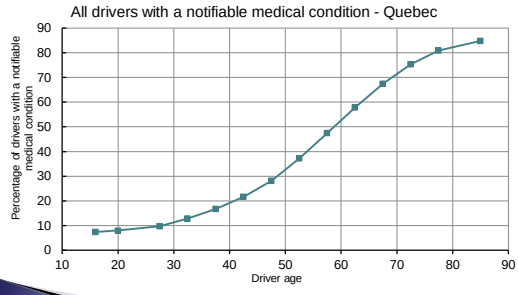
Duke of Edinburgh Accident January 2019 (Daily Express)

ITV Tonight, February 2019

What is an Older Driver?

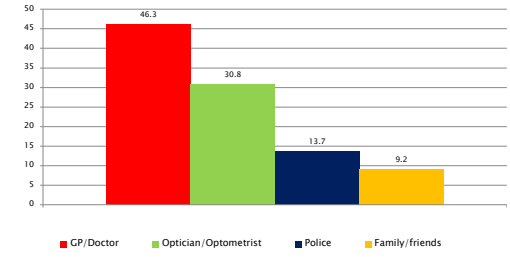
- DVLA: Any driver aged 70 years or over
- Increasing numbers of older old In 2018 = 110,790 licence holders aged ≥90
- 314 aged ≥100 (4 aged 107)
- ONS Proportion of UK population aged 65yrs and over:
- 1941: 10%
- 2011: 17%
- 2021: 20%
- 2031: 23%
- 2041: 25%

Drivers: Age and Notifiable Medical Conditions (Dow, 2013) Reported by about 6% px, 65% dr



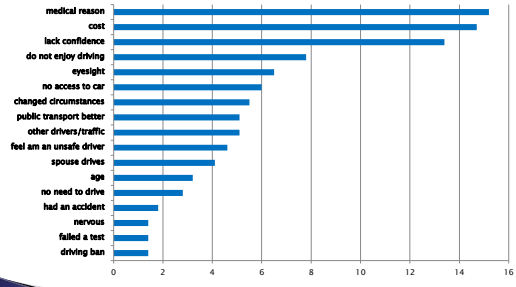
Medical and Crash Databank

Who is most influential giver of advice on giving up driving? (%) (n=2619)

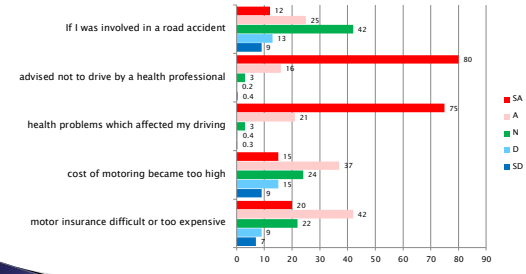


Hawley, Maylor 2015

Reasons why drivers gave up (%) n=217

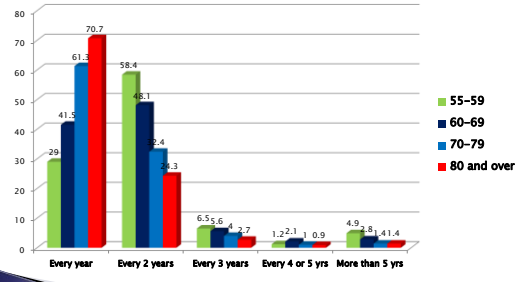


Current drivers: Circumstances which may cause you to consider giving up driving (%) (n = 2402)

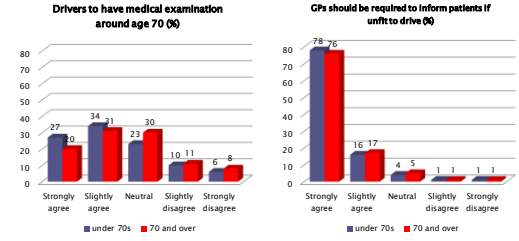


Frequency of eyesight tests by age

(n = 2619, sig p = 0.0001)



All respondents: Agreement re medical examination and GP advice, by age group (n=2619)



Significant p = 0.0001

No significant difference

Summary

- Older drivers generally regulate their driving
- Want to keep driving as long as possible, but say they will heed the advice of health professionals
- Most appear to welcome compulsory regular testing of vision and driving competence
- Health and cost of motoring are the main factors when considering giving up driving
- HPs/GPs may refer older drivers for a Local Authority run refresher course
- LAs and motoring organisations offer older driver assessment and training (Dorset Driver Gold, IAM, AA, GEM)
- Older drivers can benefit from specific driver training either delivered using a driving simulator or on-the-road (Unsworth & Baker, 2014)
- Direct older drivers to helpful websites

Web resources: Older drivers

- Older driver forum – for older drivers
- https://olderdriversforum.com/

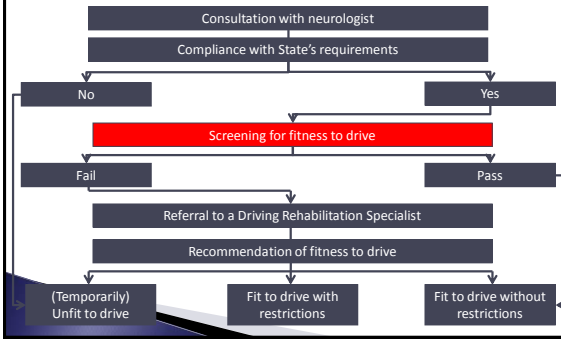
- Older drivers – for older drivers
- https://www.olderdrivers.org.uk/

- IAM Roadsmart – Policy document our survey
- https://www.iamroadsmart.com/media-and-policy/research-and-policy/research-details/keeping-older-drivers-safe-and-mobile-a-survey-of-older-drivers

Screening

- What is screening for fitness to drive?
- Why is screening important?
- What are the best screening tools?

Screening for fitness to drive? Devos, 2017



How accurate are physicians at predicting on-road performance and why screening is important?

Stroke survivors on-road success rate compared with driving ability predicted by physicians

		On-road fitness to drive assessor rated		
		Unfit to drive	Reserved*	Fit to drive
Physician rated Based on medical information	Unfit to drive	**7**	2	**6**
	Reserved*	25	**16**	50
	Fit to drive	**51**	62	**516**

735 stroke survivors *allowed to drive with one or more restrictions
Correctly predicted: (7 + 16 + 516) / (735) = 73%
Ranchet et al, 2016

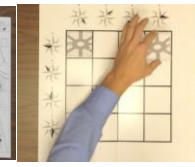
Ranchet et al, 2017 **Dementia patients**: found physicians were poor at predicting on-road FTD only 43% correctly predicted (35% overestimated, 22% underestimated fitness to drive)

Which are the best screening tools? (Stroke)

Systematic review (30 studies, n=1728) Devos et al., Neurology, 2011

Road Sign Recognition

Visual Comprehension
Traffic knowledge
Cut-off: 8.5/12



Compass

Executive functions
Divided attention
Cut-off: 25/32

Trail Making Test B

Visuomotor tracking
Shifting of attention
Cut-off: 90 seconds

Off-road driving assessment

- Medical history
- Clinical assessment – physical, visual
- Psychological assessments of cognitive and executive function
- Driving Simulator

On-road driving assessment

- Dual-control vehicle
- Patient drives a set route with varying traffic conditions
- Occupational Therapist observing (back seat) driving instructor in passenger seat.
- physical ability and endurance
- cognitive/behavioural skills
- visual/perceptive skills
- response to the traffic environment
- impact of medical condition/disability on driving competency

Possible outcomes

1. Report goes to Ministry of Transportation or Driving Licensing Authority
2. Unfit to drive (can recommend further rehabilitation while licence withdrawn and period of time before re-assessment)
3. Fit to drive without restrictions
4. If country or province has system of restrictive licensing then can recommend driving with specific restrictions

Use of Restricted Licensing

- Available Restricted licenses: some US States, some Canadian Provinces, Australia
-
  - Corrective lenses
  - Daylight only
  - Lower Speed/ No Freeway/Motorway driving
  - Within specified distance from home
  - Specified destination/ Trip purpose
  - Passenger required
  - Passenger prohibited
  - Equipment / Adaptations required
  - Automatic transmission only
- No restricted licences: UK, some US States, some Canadian Provinces

Strategic Use of Restricted Licenses January 23, 2011

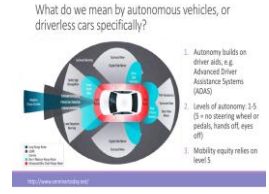
Autonomous Vehicles

Transport Secretary (2016-2019) Chris Grayling claimed that self-driving cars will transform the lives of the elderly and the disabled

UK Autodrive (Fabio De Paola/PA Wire)

Waymo (Wired.com)
started out as the autonomous car division at Google, their driverless cars have been driven over 3.5 million miles in 22 test cities

How might the technology be harnessed to enhance and enable mobility for older adults and those with mobility-related conditions - contributing to the development of a more inclusive society? (Shergold, 2019 - Flourish Project)



(Shergold, 2019 - Flourish Project)

Rac.co.uk/drive/advice/driverless-car/connected-cars/

How will self-driving vehicles benefit disabled people?

- UK Autodrive Project – Coventry and Milton Keynes
- "Once we get to the stage where vehicles are fully automated (without the need for any human driver), the benefits for disabled users should be massive. Those who cannot currently drive at all (including the blind and visually impaired) will be able to go wherever they want without having to rely on existing forms of public transport, taxis or lifts from friends and family, while those who currently rely on adapted vehicles will, in future, be able to use the same automated cars as everybody else.
- "As well as disabled people, self-driving cars could be used by the elderly and anyone else who is currently unable or unwilling to drive."
- "The pavement-based pod vehicles being used for UK Autodrive are being designed to allow wheelchair access, and will also include features to assist people with visual impairments."
- http://www.ukautodrive.com/frequently-asked-questions/#how-will-they-benefit-disabled-people

Autonomous Vehicles

- AVs are seen to hold great promise particularly for those with reduced mobility or other impairments
- There are still many challenges to be overcome in order to reach that promise
- Cost?
- Pool of vehicles for community use? can it work?
- Infrastructure? (UK government has an ambition to see driverless cars on the road by 2021)
- Interface between AVs and other vehicles and road users. What about the other 38.4 million vehicles currently registered in the UK? (www.gov.uk)
- How do you ensure equal opportunities for all in delivery of autonomous mobility?

Conclusions and Recommendations

- Many drivers return to driving after injury or illness without notifying licensing authorities or having a driving assessment.
- Most appear to return to driving without incident, but some high profile exceptions.
- Glasgow Bin Lorry Case – prompted GMC to re-issue guidance to doctors.
- Some countries issue guidance for Health professionals, not all recommendations evidence-based.
- Driving assessments are most reliable means of assessing FTD, but not possible to assess all patients.
- Rehabilitation should include return to driving including screening and assessment.

Special Interest Group for Driving and Neurological Conditions

World Federation for NeuroRehabilitation (WFNR)

http://wfnr.co.uk/special-interest-groups/

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