


Clinical utility of DriveSafe DriveAware



Case studies from clinical practice



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What is DriveSafe DriveAware?

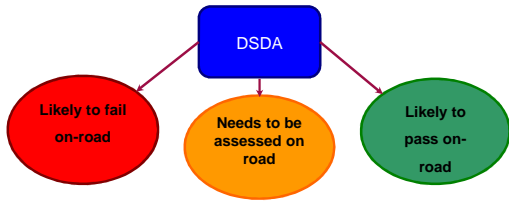
- Screening tool administered on iPad
- Designed to predict the outcome of an OT on-road driving assessment
- Helps determine the need for on-road driving assessment in older or cognitively impaired patients

P Pearson

What is DriveSafe DriveAware?

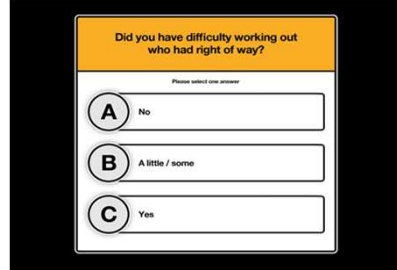
- **DriveSafe** assesses awareness of the driving environment
- **DriveAware** assesses awareness of own driving ability



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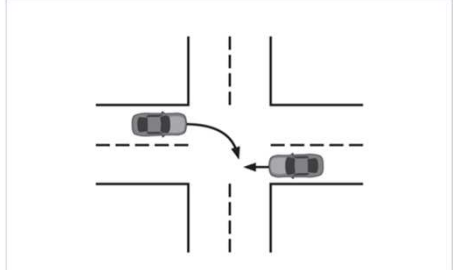
DriveAware sample question

Questions measure discrepancy between examinee's responses and the 'real' situation



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Intersection diagram test (optional)



Intersection 9 of 9 Tap the vehicles in order.

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Scoring & Reporting




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Research sample


Gender	No.	Country	No.
Female	40	Australia	80 (60%)
Male	94 (70%)	New Zealand	54
Total	134		


Age	No.	Diagnosis	No.
18-59	34	Neurological Other	23
60-91	100	CVA / TIA	39
Total	134	Dementia / Memory loss	38
(Age 75+ = 60)		Physical	7
		TBI	14
		Aged / No Dx	10
		Other	3

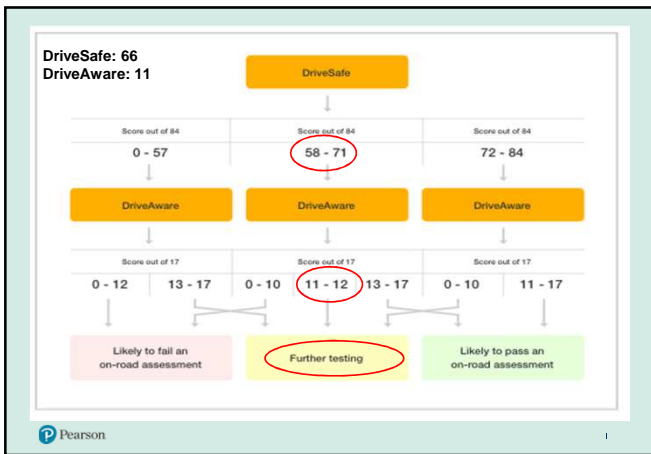
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Case Study 1 – Mrs M

- 80 year-old lady diagnosed with FTD
- Geriatrician completed DSDA
- Retired teacher
- Drives to her local bowls club (10 mins away)
- Social, chatty lady who presented well with no evident short term memory loss on interview
- No visual or physical issues





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Mrs M on-road assessment


- Tried to change lanes with a car adjacent in left lane, needed dual controls to prevent collision
- Unaware of car rolling back on hill - dual brake needed
- Unaware of sides of vehicle - driving to front road environment
- Didn't check blind spots
- OT recommended licence cancellation




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Case Study 2 – John


- 78 year old gentleman
- Cognitive impairment & Cerebrovascular disease
- Referred by geriatrician to driver trained OT after scoring 75/100 on the ACE-R
- The purpose of the Driving Assessment is to determine if his medical condition has any influence on his ability to drive safely.
- Has experienced progressive cognitive decline over the years (82/100 in 2016, 80/100 in 2017, 75/100 in 2019)
- He has a range of medical diagnoses for which he is on several medications but reports no side-effects.




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John Current living situation

- John lives with his wife in Auckland.
- John reports he is independent with all ADLs (shopping, cleaning, laundry, cooking etc)
- John reports he regularly drives anywhere he needs to go.
- He also uses buses when he needs to.
- John reports no concerns with his driving. He drives on the motorway, drives at night. He prefers not to drive in the city centre but reports this is mainly due to the difficulty with finding parking.
- John keeps himself fit and well. He is a keen runner and will run 5+ km at a time.



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John – Off Road Assessment

Physical Screen (Neck, trunk, ULs & LLs)

- ROM & strength all WNL
- Tone, sensation, proprioception all normal
- No pain reported
- Coordination & mobility are good
- Vision & Hearing WNL

Communication

- Receptive or expressive language good
- Asked appropriate questions & clearly expressed goals
- Ability to follow verbal instructions was impaired
- Difficulty with complex instructions
- Difficulty recalling complex/lengthy verbal information – only able to learn/implement one new skill at a time



Pearson 18

John – Cognitive Screeners

SIMARD MD


- Number conversion task 1/2
- List recall 0/10 (poor short term memory)
- Supermarket task 15/30 (Exed Func)
- Total score of 35/130 (Referral for driving ax recommended)

Trail Making Test A & B

- Trail A: John scored 2 minutes and 11 seconds (Average is 29 seconds)
- Trail B: Not completed

Other observations

- John was cooperative
- He had subtle lapses of concentration
- He reported feeling anxious about the Ax
- He was frustrated with some of the cognitive assessments which he found difficult
- No report or evidence of fatigue or seizures




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John – On road assessment


- Poor mirror use and no blind spot checks
- Incorrect lane selection
- Hesitation at intersections
- Driving errors occurred even in his local/familiar area.
- Driving errors continued despite receiving feedback from the assessor.
- Errors occurred at all stages of the on-road driving assessment, indicating John's performance was influenced by his medical condition, not just cognitive fatigue.
- Recommendation: Immediate voluntary retirement from driving and formal Driver Licence revocation.



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Case Study 3 – Brendan


- 42 year old man living in rural Western Australia with his wife and three children aged under 10
- Worked as a fleet manager for his local council
- History of suspected angina (not formally diagnosed)
- Involved in a serious single-car accident approximately 9 months ago
- Sustained multiple physical injuries including a fractured pelvis, broken ribs and left leg as well as a punctured lung
- Lost consciousness but was not diagnosed with a brain injury
- Reported feeling fatigued and forgetful while in hospital; Brendan worried that his brain had been affected by the accident, particularly in light of his responsibilities at work, and voiced his concerns to his local GP and his rehab physio



Pearson 1

Brendan

- Keen to return to driving, visited GP
- GP referred for an OT on-road assessment in Perth (closest location of a driver-trained OT)
- Out of pocket costs for Brendan included flights, accommodation and the OT assessment itself as well as time away from his family
- No residual physical issues affecting driving found in off-road assessment
- DriveSafe DriveAware administered:
 - DriveSafe: 75
 - DriveAware: 12
 - Outcome: Likely to pass



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Brendan - On Road Assessment

- Performed well despite stating he felt nervous, particularly driving on unfamiliar roads and in more traffic than he was used to
- Took feedback on board
- Passed easily and had unconditional licence reinstated

Brendan - lessons learned

- Brendan was very pleased and relieved with the outcome as he would have found life very difficult without the ability to drive
- DSDA score correlated with on-road Ax
- Given the absence of any diagnosed cognitive impairment, was it really necessary to go to the time, expense, stress and effort of travelling to Perth for the OT assessment?
- Had the GP administered DSDA this may have been enough to reassure Brendan and other stakeholders that he was fit to resume driving
- Particularly in areas where access to an OT on-road assessment is impacted by issues of geography, finance or scarcity DSDA has a role in triaging clients to ensure that only those who really need to be assessed on the road are referred.

Case Study 5 – Reg

- 88 year old male
- Pulled over by police on a country road near his home
- Driving slowly and irregularly
- police stated that he didn't respond to siren and lights
- Police advised him to see his GP for medical fitness to drive assessment



Reg - medical fitness to drive Ax

- GP administered DSDA as part of Ax
- Told doctor he was driving slowly because he was looking for a driveway and didn't notice the police car behind him
- Showed no physical deficits likely to impact driving
- Vision within RMS standards
- DS: 65, DA: 11 - 'Further testing'



Reg - on-road assessment


- Drove safely during assessment
- Driver-trained OT gave feedback about scanning and using mirrors more frequently
- Reg listened to feedback and adjusted his driving accordingly
- Reg reported that he avoided driving in sub-optimal conditions and tended to stay local
- Outcome: pass, retain licence



Case Study 4 – Sarah

- 39 year old woman
- Sustained a TBI in a car accident several months ago (she was driving but the accident was not her fault)
- Also fractured her wrist & had significant bruising, particularly across the right side of her body, but no organ damage. Physically is healing well.
- Had brief loss of consciousness (~2 min) and mild Post Traumatic Amnesia (less than 1 hr)
- Has had anxiety about being in the car but has started seeing a psychologist which has helped (she had a history of anxiety and already had a relationship with a psychologist).
- All indications are that she would be safe to return to driving, but she lacks the confidence to get behind the wheel






Sarah Current living situation

- Sarah is single and rents a flat with a friend in the northern suburbs of Sydney
- She is completely independent with all ADLs & IADLs
- She relies on public transportation to get to and from work. She returned to work one week after the accident with no difficulty performing her duties as an HR business partner
- She is able to walk or take public transport to most things during the week (e.g. supermarket, cafes, train station)
- She uses her car on the weekends to either visit her parents who live in the blue mountains or to visit her boyfriend who lives on the Central Coast of NSW (both are a bit over an hour drive)


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Sarah

- Initially, the psychologist worked on revisiting a range of strategies they had previously used for anxiety including CBT
- Sarah made quick progress with strategies in terms of being a passenger in a car
- But she 'wanted to be sure' she was safe to get behind the wheel. She has felt 'distracted' since the accident and is worried that will impact her driving, but is keen to get back to her weekends away.
- The psychologist suggested an on-road Ax but Sarah couldn't afford to pay for private & the public hospital had a long wait list
- Although she scored within the typical ranges on a cognitive screen when discharged from the hospital, she asked the psychologist to check her cognition again



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Sarah - Cognitive assessments

RBANS

- Scored in the average range for all areas
 - Immediate memory
 - Visuospatial/constructional
 - Language
 - Attention
 - Delayed memory
- Her lowest score was attention but was still within the average range

Trail Making Test A & B

- Trail A: scored 40 seconds (Ave is 29)
- Trail B: scored 87 seconds (Ave is 78)

Other observations

- Sarah had cohesive thoughts and good self-awareness
- She was able to implement CBT strategies
- No reported difficulties at work

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DOB / Age
13 Jan 1979 - 39 years

Assessment Date
08 Nov 2018

Gender
Female

Test Administrator

Diagnosis
Brain injury (traumatic or acquired)



DriveSafe 78 / 84

DriveAware 14

Intersection Rules 7 / 8

Outcome*
Likely to pass an on-road assessment


*Please consult manual for interpretation of category.

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Sarah - outcome


- After completing the cognitive assessments, and in particular, DSDA she had increased confidence about the cognitive demands of driving
- She started slowly, driving to nearby shopping centres & always took her flatmate for support.
- She continued working with the psychologist and practicing CBT strategies.
- After several weeks of driving locally she felt confident enough to drive up to the Central Coast to visit her boyfriend, stopping a couple times along the way to take breaks.
- In this instance, where there were no other 'red flags' as to her ability to drive, DSDA allowed Sarah to take a driving-related assessment to build her confidence without having to invest in the cost of an on-road assessment.



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Psychometric properties of DSDA

- Sensitivity of lower cutoff score in identifying 'failing' drivers
 - DS - 91%
 - DA - 89%
- Specificity of upper cutoff score in identifying 'passing' drivers
 - DS - 94%
 - DA - 91%
- Positive predictive value of DSDA: 83%
- Negative predictive value of DSDA: 92%
- Overall accuracy of classification: 88%



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Conclusions

- Screening for cognitive fitness to drive may fall to any of several health professionals
- An objective screening tool can be useful due to emotive nature of driving / cessation
- Results can boost confidence
- DSDA gives clarity about the need for referral
- Monitoring can help keep drivers on the road where appropriate



Conclusions

- Driving is an ADL and safety / independence should be considered just as with dressing, cooking, etc.
- As with other standardised tests, results should be considered in context
- Restricted access - user level B / M



Try it free for yourself!

www.pearsonclinical.com.au/DSDA



Questions?

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DSDA Research

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