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CENTRE FOR INNOVATIVE HUMAN SYSTEMS

PEOPLE  
PROCESS  
PERFORMANCE

VISION  
ZERO

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# Dementia and driving

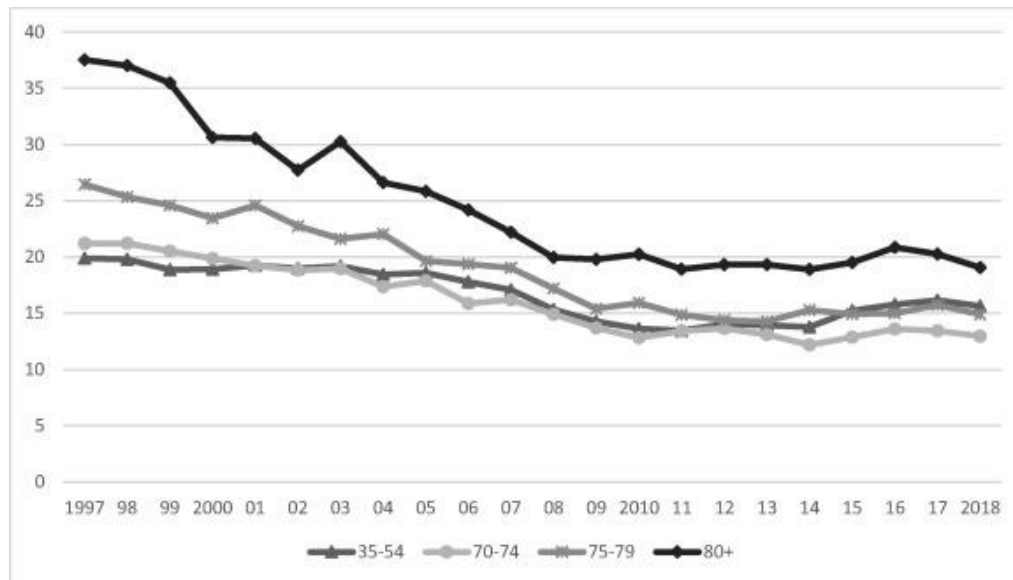
Prof Desmond O'Neill





## The 'paradox'

- Since the mid-1990s, fatal crashes per licensed driver trended downward, with greater declines for drivers ages 70 and older than for middle-aged drivers



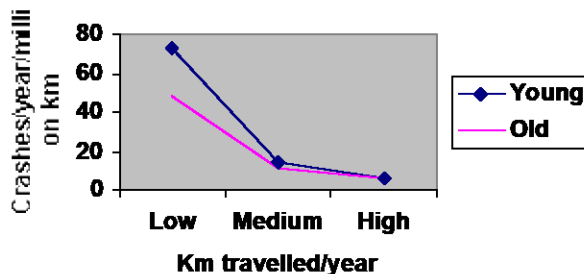
Cox AE, Cicchino JB. J Safety Res 2021 Jun;77:288-295.



# U-shaped curve?

- Older people drive less miles
- Drive on more risky roads
- Lower mileage intrinsically risky

**Crashes per year and distance travelled**





# Risk of dementia for crashes

- Overall – no clear indication of definite increase despite reduced driving performance
  - *Chee et al, Am J Geriatr Psych 2017;25: 1376-90*
- If declared to driver licensing agency – halved!
  - *Fraade-Blanc et al. Accid Anal Prev 2018;113:47-53*
  - *Dow et al. Ann Adv Automot Med 2013;57:57-66*





- Dementia
  - Progressive condition
  - Cognitive deficits
  - Impairment of social/occupational function
- Mild Cognitive Impairment
  - Memory complaint
  - $<1.5$  SD cognitive test
  - No functional loss





# Cognition

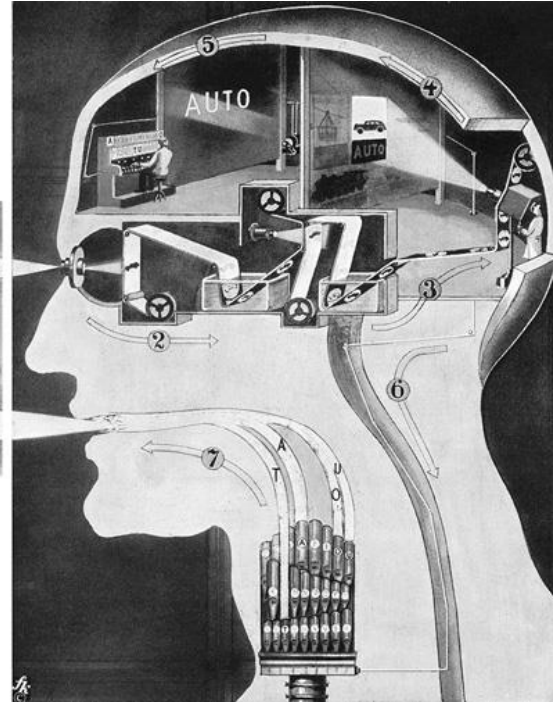
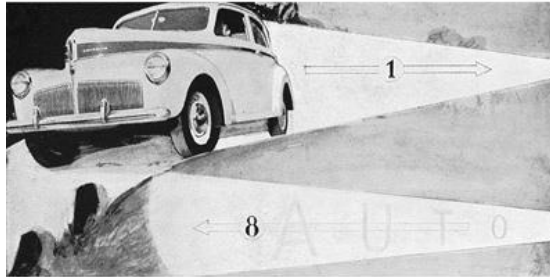
**Perception**



**Processing**



**Praxis**





# Three stages

- Cognitive dysfunction
- Delirium/dementia
- AD/VaD/LBD/CJD...

Breathlessness

Cardiac failure

Ischaemic cardiomyopathy







## Biomarkers

- The biologically based diagnosis of Alzheimer's disease (AD) is meant to assist rather than supplant the clinical evaluation of individuals with cognitive impairment.

Received: 7 February 2024 | Revised: 21 March 2024 | Accepted: 4 April 2024

DOI: 10.1002/alz.13859

### RESEARCH ARTICLE

Alzheimer's & Dementia®  
THE JOURNAL OF THE ALZHEIMER'S ASSOCIATION

**Revised criteria for diagnosis and staging of Alzheimer's disease: Alzheimer's Association Workgroup**







# NINDS-ADRDA 2024 Staging

- 0 Asymptomatic – deterministic gene
- 1 Asymptomatic – positive biomarkers
- 2 Transitional decline – minimal impact on daily function
- 3 Cognitive impairment with early functional impairment
  - detectable functional impact on complex ADLs (i.e., may take more time or be less efficient but still can complete)
- Dementia with 4) mild, 5) Moderate, 6) functional impairment



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# Neurology<sup>®</sup>

The most widely read and highly cited  
peer-reviewed neurology journal

EDITORIAL

| May 22, 2024

Check for updates

## Predicting Driving Cessation in Alzheimer Disease Performance Beats Biomarkers

This article has related content. [VIEW RELATED CONTENT](#)

Richard M. Dubinsky, MD, MPH, and Anthony C. Stein, PhD | [AUTHORS INFO & AFFILIATIONS](#)

June 25, 2024 issue • 102 (12) • <https://doi.org/10.1212/WNL.0000000000209523>



# Schema

- Routine transportation inquiry
- Assessment
- Provisional decision pending full assessment
- Intervention(s)
- Societal obligations
- Review



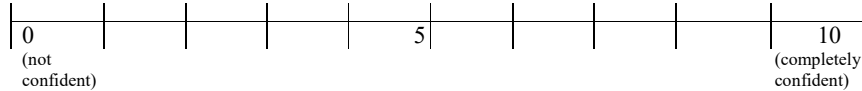


## Adelaide Driving Self-Efficacy Scale (ADSES)

ID Number: \_\_\_\_\_ Date administered: \_\_\_\_\_

***How confident do you feel doing the following activities?***

Please allocate a number from 0-10, where 0 is not confident and 10 is completely confident, for the 12 questions below.



1. Driving in your local area: \_\_\_\_\_
2. Driving in heavy traffic: \_\_\_\_\_
3. Driving in unfamiliar areas: \_\_\_\_\_
4. Driving at night: \_\_\_\_\_
5. Driving with people in the car: \_\_\_\_\_
6. Responding to road signs/traffic signals: \_\_\_\_\_

# Collateral history





# Cascade

- Clinical assessment
  - Neuro, Ophth, Musc-skel, Cognitive Screen
  - Epworth Sleep Apnoea Scale?
  - Collateral History
  - Drugs
- Occupational Therapy
- Neuropsych
- Specialist driving assessor
- Social worker





# Trichotomy

- MCI
  - No issue
- ‘Mild’ Dementia
  - On-road test
- Dementia clearly too severe for driving
  - Cessation and alternative transportation strategies





# Red Lights for dementia

- Loss ADL function
- Lost >2 IADL functions
- Collateral report impaired driving
- $\geq$  Moderate severity
- Behavioural disturbance

Current Psychiatry Reports (2018) 20: 16  
<https://doi.org/10.1007/s11920-018-0879-x>

GERIATRIC DISORDERS (W MCDONALD, SECTION EDITOR)



## An International Approach to Enhancing a National Guideline on Driving and Dementia

Mark J. Rapoport<sup>1,2</sup> • Justin N. Chee<sup>1,2</sup> • David B. Carr<sup>3</sup> • Frank Molnar<sup>4,5</sup> • Gary Naglie<sup>2,6</sup> • Jamie Dow<sup>7</sup> • Richard Marottoli<sup>8</sup> • Sara Mitchell<sup>1,2</sup> • Mark Tant<sup>9</sup> • Nathan Herrmann<sup>1,2</sup> • Krista L. Lancôt<sup>1,2</sup> • John-Paul Taylor<sup>10</sup> • Paul C. Donaghy<sup>10</sup> • Sherrilene Classen<sup>11</sup> • Desmond O'Neill<sup>12</sup>





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# On Road Assessment

Very helpful but subordinate to clinician judgement

6 monthly intervals





## Modified Ulysses Contract





Research paper

Is driver licensing restriction for age-related medical conditions an effective mechanism to improve driver safety without unduly impairing mobility?



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<sup>a</sup>School of Medicine, Trinity College Dublin, Dublin, Ireland

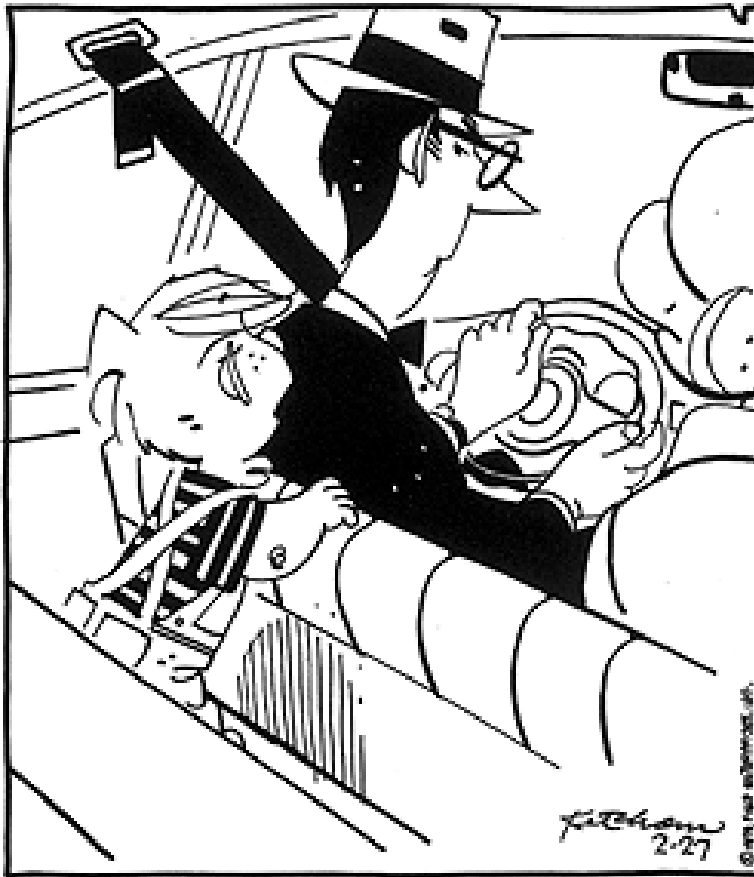
<sup>b</sup>Trinity College Dublin, and National Programme Office for Traffic Medicine, Dublin, Ireland

- Official restricted licence
  - Speed
  - Daytime only
  - Distance
- Advisory
  - Accompanied driving





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Advise  
accompanied  
driving  
  
but not  
  
as a co-pilot!

"BEFORE YOU MARRIED MOM, WHO  
TOLD YOU HOW TO DRIVE?"





# Insurance and Licensing Authority

- Is disclosure a barrier to mobility?
- Insurance companies do not seem to load disclosed and assessed dementia
- Non-disclosure may put patient at risk in terms of insurance cover and a legal penalty





# Alternative transport



## Driving as a Travel Option for Older Adults: Findings From the Irish Longitudinal Study on Aging

Michael Gormley<sup>1\*</sup> and Desmond O'Neill<sup>2</sup>







# Dangerous driving a policing issue

- Misguided kindness to prioritize medical over policing approach
- Those who witness it should report it
- Breaching confidentiality must be effective
- Removing a licence may be meaningless







# Age-based Medical Screening

- Ineffective
  - Even when Denmark added a cognitive test..
- Harmful
- Contravenes WHO guidelines on screening

O'Neill D. *BMJ* 2012;345:e6371





- The demand for certainty is one which is natural to man, but is nevertheless an intellectual vice

*Bertrand Russell*

