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**RELIABILITY OF THE ROWLAND  
UNIVERSAL DEMENTIA ASSESSMENT  
SCALE (RUDAS) VIA VIDEO  
CONFERENCING**

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**Research Team**

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- Princess Alexandra Hospital
  - Dr. Lillian Wong, Dr. Alison Cutler
  - Associate Professor Paul Varghese
- Centre for Research in Geriatric Medicine
  - Dr Melinda Martin-Khan
  - Professor Len Gray
- Prince Charles Hospital
  - Dr. Jeffrey Rowland

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**Aim**

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- We aimed to
  - assess the feasibility and reliability of the RUDAS in a telemedicine setting.


Wong, L. et. al., Reliability of the Rowland Universal Dementia Assessment Scale (RUDAS) via video conferencing. International Journal of Geriatric Psychiatry, 2010: IN PRESS.

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**BACKGROUND**

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Clem 7 Tunnel  
Below the Brisbane River

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**Background**

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- Standardised Assessment Tool:
  - Standard questions/recording responses/scoring
  - Purpose:
    - measure change over time
    - Consider severity at a point in time
- Examples:
  - Olympics 100 metre race
  - Mini Mental State Examination (MMSE)

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**Background**

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- Full assessment of memory includes:
  - Standardised Assessment Tools
  - Blood tests
  - Imaging
  - Interview
- Other uses (for standardised assessment tools):
  - Tracking change over time
  - Capacity
  - General evaluation
  - Research

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## Background

- Consider:
  - Options: Face to face, Phone, Videoconference
  - Many assessment tools require modification when administered from a distance
  - Modified assessment tools are 'modified'
- Goal:
  - Tools which can be applied interchangeably
  - No modification
  - Scores derived from different formats mean the same thing



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## Background

- Reliability of assessing cognition via video conferencing
  - Diagnosis of dementia
    - Loh (2004, 2009); Shores (2004); Martin-Khan (2007, 2008)
  - Standardised assessment tools
    - The Mini-Mental State Examination (MMSE)
      - Ball and Montani (1993, 1996, 1997, 1999); Saigari (2002)
    - Geriatric Depression Scale (GDS)
      - Grob (2007); Saigari and Loh (2002, 2004)
    - Cambridge Cognitive Examination (CAMCOG)
      - Ball (1996)
    - Clock Face Drawing Test
      - Montani (1996, 1997)
    - Rowland Universal Dementia Assessment Scale (RUDAS)



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## Background

### The Rowland Universal Dementia Assessment Scale (RUDAS)

- Has six domains of assessment
  - visuospatial testing
  - praxis
  - visuoconstructional testing (cube copy)
  - functional judgment (crossing the road)
  - recall of groceries
  - animal naming
- Maximum score of 30



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## Background

- RUDAS:
  - validated cognitive assessment instrument
  - Designed for non-English speaking populations (not culture specific)
  - Cut point of 23 as a positive screen for dementia,
  - Sensitivity = 89%; Specificity: 98%,
  - Inter-rater reliability = 0.99; Test-retest reliability = 0.98
  - Addresses frontal lobe impairment, including functional judgment and praxis

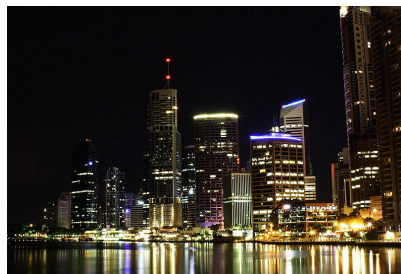
Rowland, JT, et al., The Rowland Universal Dementia Assessment Scale (RUDAS) and the Folstein MMSE in a multicultural cohort of elderly persons. *International Psychogeriatrics*, 2006, 18(1); p. 111-120.

Storey, JE, et al., The Rowland Universal Dementia Assessment Scale (RUDAS): a multicultural cognitive assessment scale. *International Psychogeriatrics*, 2004, 16(1); p. 13-31.



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## METHOD



Brisbane City, QLD



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## Method

- Each patient administered the RUDAS twice
- Paired assessments:
  - FTF: at the bedside
  - VC: Outpatients department (GARU) – same building
- Randomised to:
  - Format of assessment (FTF or VC)
  - Order of Doctor assessment (doctor 1 or doctor 2)
- Scoring:
  - Scored during the VC assessment




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### Method

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- **Sample:**
  - Geriatric and Rehabilitation inpatients
  - Patients identified for participation by the treating team
  - Grouping:
    - Normal: normal or mildly impaired
    - Dementia: moderately or severely impaired

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### Method

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- **Power Calculation**
  - Sample size of 21 required to show agreement between FTF and VC
  - Agreement with +/- 1 of the mean scores

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### Method

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- **Assessors:**
  - Geriatric registrars
  - Previous involvement in the geriatric memory clinic
  - Blinded to the patient's MMSE score
  
- Training in the administration and scoring of the RUDAS was carried out by a neuropsychologist
- A calibration period for consistency in scoring

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### Equipment


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- Two sets of VC equipment


CLINIC ROOM



VC ROOM




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### Equipment


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- Television screen (Samsung 20" LCD display with SV input)
- CODEC device (Sony PCS1 VC)
- Omni-directional microphone
- Liberator Simulator with 8 BI ports (SI/8B0P/01) was used to connect the units at an ISDN connection speed of 384 kbit/s




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Zarate, C.A., et. Al., Applicability of telemedicine for assessing patients with schizophrenia: acceptance and reliability. The Journal of Clinical Psychiatry, 1997, 58(1): p. 22-25


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### RESULTS

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South Bank, Brisbane

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### Results

- Sample: N= 42
- Age: 74.8 years (Range 41-95; SD 11.4)
- MMSE score: 24.7 (Range 10-30; SD 4.8; Median 26.5).
- Documented cognitive issues: 43%
- Primary Diagnosis:
  - Orthopedic Rehabilitation (38%)
  - Stroke Rehabilitation (24%)

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### Results

- Decision Rule: RUDAS administered via VC was reliable if the difference in mean scores was NO MORE THAN +/- 1

Impairment	N	FTF	VC	Difference
Total Sample	42	24.86 (10-30; SD 4.14)	24.9 (12-30; SD 4.23)	0.04

Impairment	F	p	df	η <sup>2</sup>
Total Sample	0.798	<0.001	1,114	0.309
Normal/Cognition	0.563	0.001	33	0.490
Dementia	0.728	0.007	7	0.451

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### Method

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### Method

Domains	FTF	VC	Difference
Visuospatial Orientation	4.88 (1-5; SD 0.64)	4.86 (3-5; SD 0.42)	0.02
Praxis	1.41 (0-2; SD 0.77)	1.21 (0-2; SD 0.78)	0.20
Cube	1.83 (0-3; SD 1.16)	1.79 (0-3; SD 1.12)	0.04
Judgement	2.61 (0-4; SD 1.16)	3.05 (1-4; SD 0.99)	-0.44
Recall	6.20 (2-8; SD 2.23)	6.19 (0-8; SD 2.37)	0.01
Animals	7.76 (3-8; SD 0.99)	7.83 (4-8; SD 0.76)	-0.07
Total	24.86 (10-30; SD 4.14)	24.9 (12-30; SD 4.23)	-0.04

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### Results

N=42	Diagnosis		Agreement with Treating Team		
	Dementia (n=8)	Normal (n=34)	Dementia (n=8)	Normal (n=34)	Overall (N=42)
FTF	10 (24%)	32 (76%)	6 (14%)	30 (76%)	36 (86%)
VC	11 (26%)	31 (74%)	7 (17%)	30 (71%)	37 (88%)

	Kappa	Sens.	Spec.
FTF	0.58 p=0.0002 <sup>ns</sup>	0.88	0.75
VC	0.66 p<0.0001 <sup>ns</sup>	0.88	0.88

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### Limitations

- No previous study of RUDAS assessment in hospital patients
- No baseline comparison group of paired FTF assessments
- No formal assessment to rule out delirium (Based on general clinical assessment of treating team)

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## Conclusions

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- There is no statistically significant difference in mean RUDAS scores for FTF or VC administered assessments at both the total score, and individual domain levels.
- There are no adjustments required to the format of questions in order to administer the RUDAS via VC.
  - There are some administration details such as identifying 'left' and 'right'
- The RUDAS can be reliably administered via VC in post acute patients as an alternative to the FTF RUDAS if required.



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