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# Neurology and Neurological Disorders

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## Comparison of brief clinical delirium and cognitive testing amongst patients admitted via the Trauma and Orthopaedic (T&O) acute intake - A service evaluation on the clinical dependence, efficacy and accessibility of implementing Gwent Orientation and Awareness Listing (GOAL) testing in relation to the 4AT at the Royal Gwent Hospital Newport, UK

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**Background:** GOAL is the brief delirium/cognitive clinical test currently employed at Royal Gwent Hospital Newport where the 4AT test is routinely utilized. To our knowledge, both tests have not been prospectively compared against, relative to equal patient cohorts.

**Objectives:** We aim to, (1) evaluate two rapidly performed valid cognitive examinations amongst the same patient cohort, and (2) assess patient testing results among acute/emergency T&O admissions compared with previously obtained patient data presenting via the acute medical intake.

**Methods:** Verbal consent to cognitive testing by means of GOAL and 4AT was sought from patients presenting acutely to T&O over four weeks period. A GOAL score of <8/10 is deemed a "fail", and on 4AT any error is deemed "possible cognitive impairment". Patient documentation regarding dementia, epilepsy, psychiatric/neurological illness was recorded alongside living arrangements.

**Results:** There were 146 patients, of whom 10 were not well enough to be scored, and 1 patient declined to participate. Therefore, results are based on a 135-patient cohort, all of whom were able to co-operate with both scores. Of these, 92 "passed" both tests, 40 "failed" on 4AT, of which 18 also "failed" on GOAL. There were 3 who "failed" on GOAL but passed on 4AT. Likelihood of test failure was significantly greater with 4AT ( $X^2 = 7.65, p < 0.01$ ). Ages and comparisons


on GOAL testing results with historical general medical patient cohort displayed significant differences between patient co-operation in acute medical and T&O intakes.

**Conclusions:** (1) The 4AT test is more likely to signal cognitive impairment than GOAL among T&O emergency admissions; (2) T&O intake patients are more likely to co-operate with cognitive testing by GOAL, and they perform better than acute medical emergency admissions.

### Speaker Biography


Jack Wellington LGMS is a year 4 Medical Student at Cardiff University Medical School, eager to pursue a career in Neurosurgery alongside attaining a DTM&H for clinical practice globally, achieve a PhD in Surgical Sciences (specializing in Neuro infectious Diseases), a WHO Internship in Geneva, and an academic foundation post (conducting research in neurosurgical practice). I am currently intercalating at the LSHTM for an MSc Medical Microbiology and aspire to undertake a neurosurgery elective at Oxford/Harvard/Yale University. He currently holds various national and university society positions, examples including Research and Audit Lead for the Student Psychiatry Audit and Research Collaborative (SPARC) UK, President and Founder of Cardiff University Infectious Diseases Society, RCPSC Trainees' Committee Undergraduate/Student Member, previous positions including president, clinical and intensive care leads for Cardiff University Dermatology, Clinical Neurosciences and Anesthetics, Perioperative and Intensive Care Societies respectively, and has lead several local and national audits/research projects.

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 Notes:

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University Health Board



COMPARISON OF BRIEF CLINICAL DELIRIUM AND COGNITIVE TESTING AMONGST PATIENTS ADMITTED VIA THE TRAUMA AND ORTHOPAEDIC (T&O) ACUTE INTAKE: A SERVICE EVALUATION ON THE CLINICAL DEPENDENCE, EFFICACY AND ACCESSIBILITY OF IMPLEMENTING GWENT ORIENTATION AND AWARENESS LISTING (GOAL) TESTING IN RELATION TO THE 4AT AT THE ROYAL GWENT HOSPITAL NEWPORT

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**Objectives:**

- Primary Objectives:**  
Assess 2 rapidly-performed valid cognitive examinations, the GOAL and 4AT, amongst T&O intake according to clinical effectiveness, availability and reliability. Critically-appraise acute/emergency T&O admissions testing results compared with the previous acute medical intake patient dataset.
- Secondary Objectives:**  
Evaluate appropriate patient past medical (and social) histories on GOAL and 4AT testing alongside study participant demographics to identify certain factors which may impact testing success/failure rates for both cognitive testing systems.

**Methodologies:**

Over a 4-week study period (12th March 2019 - 8th April 2019 weekends inclusive), we identified eligible patients according to a strict exclusion criteria (Figure 1).

Verbal consent from eligible patients presenting via the acute T&O intake at the Royal Gwent Hospital was sought for GOAL and 4AT testing during the study period. A scoring of <8/10 s indicates a "fail" on the GOAL and any error on the 4AT indicates "possible cognitive impairment". (1-2)


Evidence of current or pre-existing Dementia, Epilepsy, psychiatric/neurological illness in patient documentation was noted alongside living arrangements.

**Background and Introduction:**

GOAL is currently employed Delirium and cognitive testing system in MAU at Royal Gwent Hospital Newport whereas the 4AT assessment is routinely utilised at Ysbyty Ystrad Fawr Hospital. (1-2) To our knowledge, both exams haven't been compared against each other prospectively in relation to equal patient cohorts. Thus, we aim to evaluate and critically-appraise the GOAL and 4AT tests amongst an equal patient cohort. The present study compares patient-testing results among acute/emergency T&O admissions against patient data collected previously presenting via the acute medical intake.

**Results:**

- Results are based on a 135-patient cohort, all of whom were able to co-operate with both scores. Of these, 92 "passed" both tests, 40 "failed" on 4AT, of which 18 also "failed" on GOAL. There were 3 who "failed" on GOAL but passed on 4AT.
- Likelihood of test failure was significantly greater with 4AT ( $\chi^2 = 7.65, p < 0.01$ ). Ages and comparisons on GOAL testing results with historical general medical patient cohort displayed significant differences between patient co-operation in acute medical and T&O intakes (Figure 2).



**Figure 1 - Outline of participant data collected for 4-week study period.**

Cohort	Median age	Mean age (SD)	Pass (Score >7)	Fail (Score <8)	Total	Unable to co-operate
T&O	64	63 (19.8)	114 (84%)	21 (16%)*	135	0
Medical	73	68 (18.0)	720 (73%)	270 (27%)*	990	58

**Figure 2 - Comparison between T&O and general medical intakes for current and historical datasets**  
(\*  $\chi^2 = 8.51, p < 0.01$ ; SD - Standard Deviation).

**Conclusions:**

- The 4AT test is more likely to signal cognitive impairment than GOAL among T&O emergency admissions
- T&O intake patients are more likely to co-operate with cognitive testing by GOAL, and they perform better than acute medical emergency admissions

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- M.C. Allison, A. Kontoyannis, D. Durai, G.I. Turner, D.L. Fone, GOAL: a simplified mental test for emergency medical admissions, QJM: An International Journal of Medicine, Volume 97, Issue 10, October 2004, Pages 663-669.
- Shenkin SD et al. Protocol for validation of the 4AT, a rapid screening tool for delirium: a multicentre prospective diagnostic test accuracy study. *BMJ Open*. 2018;8(2):e015572.