Age and Ageing 2014; **43:** 166–168
doi: 10.1093/ageing/aft184
Published electronically 25 November 2013

Screening for dementia and other causes of cognitive impairment in general hospital in-patients

Formal diagnosis of dementia is generally thought by practitioners, advocacy groups and patients to be helpful. The benefits include providing access to evidence-based treatments, care and support for the individual and their carers, advance planning about how financial and welfare decisions can be made if capacity is lost, and being able to participate in relevant research [1]. Mostly, diagnosis is reached when a patient and often their carer attends a general practitioner with concerns about their memory and then undergoes a more formal assessment process with a specialist. Yet this route to diagnosis at a population level is manifestly ineffective, because in the UK around half of dementia remains undetected. This enormous diagnostic gap has prompted a growing discussion about the advantages and disadvantages of screening for dementia (e.g. see [2] and associated correspondence).

In the UK, the general approach to screening has been not to implement population testing programmes until there is convincing evidence on effectiveness, cost benefit, social and health service training implications and system and societal readiness, including methods and therapeutic evidence. These criteria have not yet been met in the case of dementia [2], and screening is currently not recommended in primary care and community settings.

However, there has not been a detailed debate about the advantages and disadvantages of dementia screening in general hospitals. This matters because critical additional considerations apply in this environment [3]. Dementia is much more common in older inpatients: ∼40% of inpatients have dementia, and only around half of these will already have been diagnosed [4]. This compares with 10% of people over age 65 in the community [5]. Knowing that an inpatient has or might have dementia is essential because of the multiple immediate implications for care, for example: (i) the value of identification of vulnerable patients who should be assessed for delirium and/or seen as high risk for developing this in future; (ii) assessment of capacity to consent to treatments and participate in discharge planning, with implementation of appropriate systems if capacity is lacking; (iii) early involvement of carers to gain collateral history and formulate an appropriate inpatient care and discharge plan; (iv) ensuring appropriate re-assessment and follow-up, including assessment of safety in their own home; (v) considering the appropriateness of medical treatments and their delivery (e.g. additional support for complex medication regimes such as warfarin). Thus, unlike screening in stable community-dwelling patients, there is an extremely strong case for detecting dementia and other forms of cognitive impairment in hospital inpatients. This is recognised in multiple reports, and has helped to prompt initiatives such as the CQUIN (Commissioning for Quality and Innovation) payment framework to incentivise the detection of cognitive impairment in English hospitals [6].

Jackson *et al.*'s article [7] in a recent edition of *Age and Ageing* is a timely summary of the literature concerned with 'screening for dementia' in the general hospital. The review finds a remarkable lack of evidence to help clinicians who wish to select a well-validated tool [3]. The largest evidence base was for the use of a score of <7 on the AMTS (Abbreviated Mental Test Score) as predictive of a diagnosis of dementia with a sensitivity of 81% (95% confidence interval: 76–86%) and specificity of 84% (95% CI: 83–85%). However, there was insufficient evidence on any other test to assess its performance, sample sizes were generally small, and other acute and chronic factors influencing AMTS scores were mostly not explicitly considered in the studies covered in the review. Indeed, the article highlights the lack of reflection in the literature on the challenges in applying and interpreting cognitive tests in acute hospital inpatients.

These challenges mean that there are multiple qualifications to consider when using a single cognitive test as a screen for dementia. The main caveat is that patients in hospital have several potential reasons for impaired cognition. Delirium is the most common and important to detect: it affects at least one in eight hospital patients, and is associated with multiple adverse outcomes. Most older patients with delirium also have dementia, and in people without dementia delirium is associated with a greatly increased risk of future dementia [8], so delirium is itself a valuable marker of dementia. However, its fluctuating and generally transient nature means that the cognitive test score does not accurately index prior long-term cognitive functioning. A cognitive screening test score recorded in the medical notes without appropriate context might be thought at a future date to reflect chronic impairment, which would be incorrect. Clinicians are also aware that, even in the absence of dementia or delirium, patients in acute hospitals may perform poorly on formal cognitive tests for other reasons, including: acute illness, pain, lethargy, sleep deprivation, medication (e.g. opioids, benzodiazepines), depression, anxiety, not wishing

to engage with testing, language barriers, cultural issues and learning disability [9].

Therefore, simple cognitive tests used in isolation are not reliable or valid enough for dementia screening in acute hospital populations. We suggest that clinicians and managers carefully consider the role of such tools, and rather than seeing them as screening for dementia, should instead see them as part of the overall clinical assessment of a patient. Cognitive testing is no more a screening tool for dementia than a chest examination is a screening tool for pneumonia, or a laboratory test of urea and electrolytes is a screening test for chronic kidney disease. The result must be interpreted in the context of the whole presentation, with knowledge of previous results, and review of progress during the admission including further tests as indicated. In experienced hands, with stable patients (for example in rehabilitation settings), and consideration of functional status, cognitive tests do have a role in detecting dementia in general hospitals [3]. Yet even in these circumstances, there are important other considerations, including the need for pre-diagnostic counselling.

More broadly, cognitive tests have a critical role in hospital practice in detecting cognitive impairment, and as we have argued, detecting cognitive impairment is essential. However, a more nuanced understanding of the types and roles of different tests is required to avoid misinterpretation. A tool to be used soon after admission should be sensitive to delirium (such as the 4 A's Test; www.the4AT.com) to allow clinical prioritisation. In stable patients later in their admission a more detailed tool such as the Addenbroke's Cognitive Examination-III (ACE-III) [10] would provide a more fine-grained measure of cognition to start the process of formal diagnosis. Informant-based tools such as the Informant Questionnaire for Cognitive Decline in the Elderly (IQCODE [11]) have a parallel role in identifying previously undiagnosed dementia, though the use of such tools has not yet been studied in hospital populations. The Diagnostic Test Accuracy and ALOIS programmes of the Cochrane Dementia and Cognitive Improvement Group (Oxford) are systematically exploring the existing research base for early tests and how robust they are in clinical and population settings [2]. This will build on Jackson *et al.*'s finding to inform research in this important area.

In conclusion, though some tests do perform adequately in screening for dementia, we advocate caution in the use of single cognitive tests for dementia 'screening' in hospital. Rather, we encourage detection of individuals with cognitive impairment, then further assessment to identify the cause of this as appropriate. We argue for a change in attitude to identification of cognitive impairment in the general hospital from 'screening' to it being seen as part of normal systems examination. Further work is required to identify the most appropriate tests for different stages in the patient journey, but whatever test is used, evidence of impairment on simple tests must be interpreted in the light of contextual and other diagnostic information. This will allow clinicians to follow appropriate care pathways considering, for example, delirium management, communication and consent for hospital procedures, as well as being aware of the possibility of previously undiagnosed dementia and planning further evaluation and care both during and after the hospital admission.

Conflicts of interest

A.M.J.M. holds patents on computerised tests for detection of delirium. A.M.J.M. has received honoraria from Shire and Lundbeck.

Funding

T.C.R. is supported by Alzheimer Scotland and he is employed in the NHS by the Scottish Dementia Clinical Research Network, which is funded by the Chief Scientist Office (part of the Scottish Government Health Directorates). T.C.R. is a member of the Alzheimer Scotland Dementia Research Centre funded by Alzheimer Scotland. T.C.R., S.D.S. and A.M.J.M. are members of the University of Edinburgh Centre for Cognitive Ageing and Cognitive Epidemiology, part of the cross council Lifelong Health and Wellbeing Initiative (G0700704/84698). Funding from the Biotechnology and Biological Sciences Research Council, the Engineering and Physical Sciences Research Council, the Economic and Social Research Council, and the Medical Research Council is gratefully acknowledged. Funders played no role in any part of the writing of this editorial.

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Age and Ageing 2014; **43:** 168–170
doi: 10.1093/ageing/aft213
Published electronically 19 January 2014

Measuring and defining orthostatic hypotension in the older person

Estimates of the prevalence of orthostatic hypotension (OH) have previously found it to be as high as 6% in the community and 70% in long-term care facilities [1, 2]. Despite this high prevalence there remain many unanswered questions regarding the diagnosis, treatment and natural history of OH. The 1996 American Autonomic Society and American Academy of Neurology Consensus criteria were a big step forward in standardising the clinical diagnosis and enabling academic progress; defining OH by sphygmomanometric measured drops in systolic blood pressure (SBP) of 20 mmHg and diastolic blood pressure (DBP) of 10 mmHg during active standing or head up tilt [3]. Now these consensus criteria have been outgrown in many ways, largely as a result of the widespread use of continuous, beat-to-beat, non-invasive blood pressure monitoring. The 1996 diagnostic criteria appear too rigid for the dynamic profile gained during beat-to-beat monitoring. Commonly arising patterns for which the diagnostic criteria are unhelpful include brief but significant drops in BP and sustained BP drops that do not meet the diagnostic threshold. In an attempt to address these questions an update to the Consensus definition of OH was published in 2011 [2]. The specific changes include a definition for 'initial OH' (>40 mmHg drop SBP, >20 mmHg drop DBP), a requirement for a larger drop in people with hypertension (>30 mmHg SBP, but without a definition of what to consider as hypertension) and the addition of 'sustained drop' to our usual diagnostic criteria of OH (without a definition of what constitutes a sustained drop).

Cooke *et al*.'s research paper, in a recent issue of Age and Ageing describes the prevalence of OH and the beat-to-beat BP profile in a cohort of 326 community-dwelling older adults in Ireland [4]. Their cohorts are derived from an original sample of 552 older adults and are fitter than those who would typically undergo assessment for OH. The majority had no cognitive impairment on MMSE, no functional impairment on Barthel and a low prevalence of self-reported falls. Given their cohort's demographic it may be a surprise that the prevalence of OH that they report is 59%. In common with previous studies those with OH had a lower body mass index, higher resting heart rate and higher rate of psychoactive medication co-prescription [5, 6].

Previous studies, which identified the prevalence of OH as 7–30% in community-dwelling older people, all used traditional sphygmomanometers with varying methodologies [7, 8]. It is unsurprising that beat-to-beat BP measurement can identify more instances of BP dropping below the diagnostic threshold; indeed, a recent study using beat-to-beat measurements reported a prevalence of 94% in community-dwelling elders [9]. This is one of the challenges of beat-to-beat monitoring; when to consider a brief and transient BP drop as artefact, normal or diagnostic. Longitudinal studies to quantify the longer term risks associated with these BP drops of unknown significance are required to answer these questions. However, without such evidence, the answer is probably to interpret the drop in the context of the individual undergoing the test, with clues from the history, risk factors and symptoms at the time of testing.

One method of addressing the diagnostic difficulty would be to categorise OH into different morphological patterns of