

# A quality improvement approach to cognitive assessment on hospice admission: could we use the 4AT or Short CAM?

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**To cite:** Baird L, Spiller JA. A quality improvement approach to cognitive assessment on hospice admission: could we use the 4AT or Short CAM? *BMJ Open Quality* 2017;**6**:e000153. doi:10.1136/bmjopen-2017-000153

Received 25 June 2017

Accepted 30 July 2017

## ABSTRACT

**Background** Prevalence studies show that 13%–42% of patients admitted to specialist palliative care inpatient units have delirium. Symptoms of delirium are often subtle and easily missed, or misdiagnosed as fatigue or depression, and so the use of a screening tool could improve early identification and management of delirium and lead to improved outcomes. Patients admitted to hospices are often frail and tired, therefore a quick and easy-to-use method of cognitive assessment is essential.

**Methods** A quality improvement (QI) approach (PDSA: Plan, Do, Study, Act) was used to improve screening for delirium on admission to a hospice unit. A baseline measure was taken of the rate of performance of cognitive assessment on admission. Five PDSA cycles were then undertaken which involved implementing change and then evaluating results through auditing case notes and interviewing staff.

**Results** The first cycle determined staff preference between two cognitive assessment methods: the Short Confusion Assessment Method and the four 'A's Test (4AT). Two further PDSA cycles embedded the 4AT (the preferred tool) into the admission process, establishing it as a usable tool in the hospice setting for up to 92% of admissions. A subsequent cycle showing poor sustainability prompted staff education and changes to admission documentation, resulting in an increase in cognitive assessment being performed, from 50% to 76%.

**Conclusion** The 4AT is a usable tool in the hospice inpatient setting to assess patients' cognitive state on admission and can easily be incorporated into the admission process. The QI approach highlighted the need to link staff awareness of their use of the screening tool with perceived improvements in the treatment of delirium, which prompted the creation and implementation of a 'Delirium Checklist'. Some initial lack of sustainability was addressed by staff education and changes to the admission paperwork to ensure compliance with the use of the 4AT and sustained improvement in screening for cognitive impairment.

## PROBLEM

Delirium is one of the most common and serious neuropsychiatric complications in the palliative care setting<sup>1</sup> and prevalence studies show that 13%–42% of patients admitted to specialist palliative care inpatient units have delirium.<sup>2</sup>

It was noted that the assessment and screening for cognitive impairment on patient admission at the Marie Curie Hospice in Edinburgh required review. We subsequently undertook a quality improvement project (QIP) to see if this was something which could be improved.

Despite admission documentation suggesting completing the Short Confusion Assessment Method (Short CAM),<sup>3</sup> this was rarely done. The Short CAM appears quick and easy to use, but was not printed in patients' notes meaning it was not easy to access and therefore unlikely to be completed.

Using a quality improvement approach (PDSA: Plan, Do, Study, Act) this project aimed to improve cognitive assessment on admission to a hospice inpatient unit by: (1) determining staff preference between the Short CAM and the four 'A's Test (4AT)<sup>4</sup> and (2) using PDSA cycles to embed the preferred tool into the admission process (figure 1), while continuing to assess usability and completion rate.

Fully implementing cognitive assessment into the admission process will allow early identification of patients who may be suffering from delirium. This will subsequently allow early management and, if appropriate, investigation and treatment of the underlying cause, which will lead to improved patient outcome.

## BACKGROUND

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders has revised the diagnostic criteria for delirium.<sup>5</sup> Delirium is now defined as 'a disturbance in attention and awareness' which 'develops over a short period of time' (usually hours to days) and 'represents an acute change from baseline', and 'tends to fluctuate' during the course of a day. In addition, there is a 'disturbance in cognition'. The above disturbances 'are not

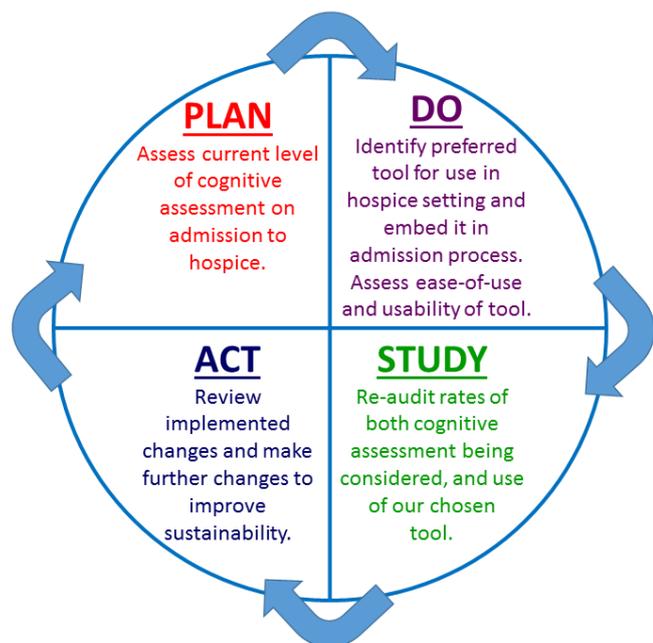


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**Figure 1** PDSA (Plan, Do, Study, Act) model used in the quality improvement project (QIP).

better explained by a pre-existing, established or evolving neurocognitive disorder and *do not occur in the context of a severely reduced level of arousal such as coma*. Finally, there is evidence from the history, examination or investigation findings that ‘the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal, or exposure to a toxin, or is due to multiple aetiologies’.

Delirium can have a significant detrimental effect on quality of life for patients and their families,<sup>6</sup> especially at the end of life. It can impede communication between patients and their families,<sup>6</sup> at a time when this is especially important, cause significant family distress during an already difficult and emotional time, and can additionally interfere with pain and symptom control.<sup>1</sup> Patients with advanced disease are at high risk of developing delirium<sup>6</sup> but, despite this, delirium is often under-recognised or misdiagnosed in the terminally ill, and even when identified it is often mismanaged or untreated.<sup>1</sup>

Symptoms of delirium are often subtle and easily missed, or misdiagnosed as fatigue or depression. The use of a screening tool to assess patients’ cognitive state on hospice admission, allowing early identification and therefore treatment of delirium, whether that is investigation and treatment of the underlying cause, or purely symptom control, is therefore crucial. Patients admitted to a hospice are often frail and tired, therefore a quick and easy-to-use method of cognitive assessment is essential.

The 4AT, although not validated in hospice inpatients, has been validated for hospitalised patients<sup>7</sup> and takes about 2 min to complete. The Short CAM also appears quick and easy to use and is a shortened version of the

Long CAM which has been validated in the palliative care setting.<sup>8</sup>

## MEASUREMENT

The notes of eight consecutive patients admitted to the hospice in March 2016 were reviewed. None of these patients had any form of cognitive assessment performed on admission despite several being noted to be ‘confused’.

These baseline data make it clear that the implementation of a cognitive assessment tool into the admission documentation would be valuable, allowing formal documentation of patients’ cognitive state on admission, and encouraging early management of any delirium identified, and investigation and treatment of the underlying cause, when appropriate.

## DESIGN

The baseline data made it clear that the admission documentation was not encouraging formal cognitive assessment on patient admission. Medical and nursing colleagues agreed that current procedures required amendment and were willing to test the Short CAM and 4AT on our patient population and provide feedback on the usability of these tools within the hospice setting.

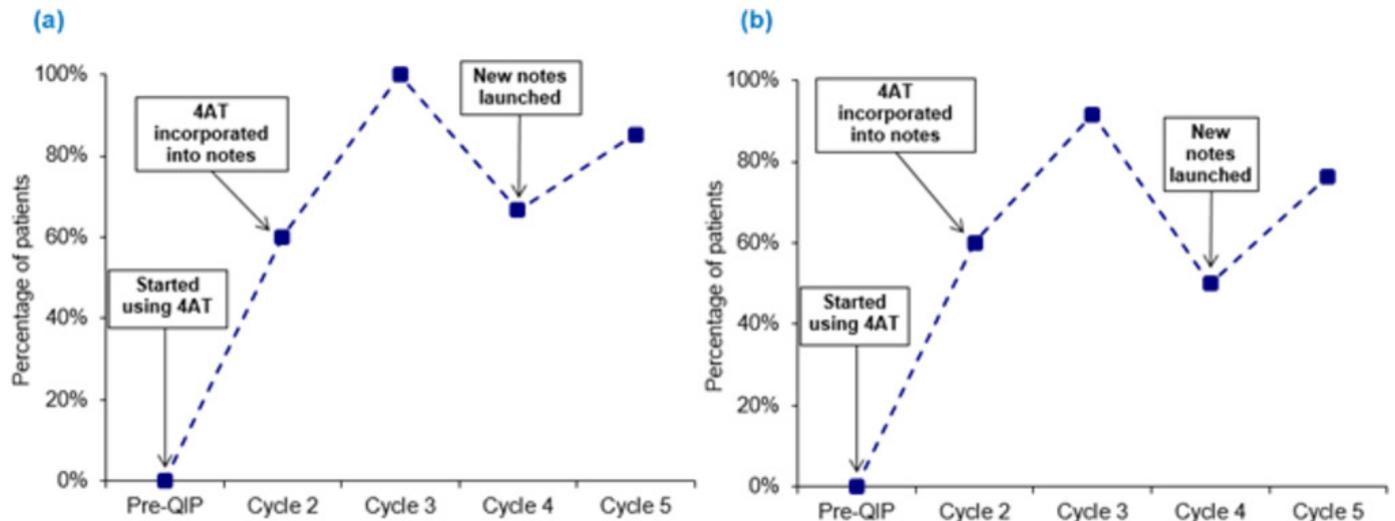
It was agreed that a series of PDSA cycles would be undertaken and with each cycle feedback would be received from staff regarding the benefits and challenges of the changes made. Through repeated PDSA cycles we planned to identify a usable tool for assessing patients’ cognitive state within the hospice setting which could easily be incorporated into our admission process, without hugely increasing the paperwork burden. Highlighting the importance of early identification and treatment of delirium in improving patient outcome would further encourage staff to engage with the proposed changes.

## STRATEGY

### PDSA cycle 1

Two nurses and two doctors performed both the Short CAM and 4AT on one patient each. Feedback was then received on the ease of use and usability of both tools within the hospice setting. Three of the four staff preferred the 4AT, stating it was ‘easier to fill in at the time’ and ‘less open to interpretation’, one nurse preferred the Short CAM as they felt it allowed them to both ‘get to know’ and get ‘a better feel for’ the patient. All four staff agreed the 4AT was quicker.

This was not an unexpected result. We had predicted that staff would prefer the 4AT, as it is easy to use and quick to perform, and due to the scoring system there is no ambiguity about the answers. Also, in order to use the Short CAM users need to read a training manual which acts as a small barrier. It was therefore agreed we would implement the 4AT.



**Figure 2** Percentage of patients where cognitive assessment was (a) considered and (b) performed at each cycle of the quality improvement programme (QIP). 4AT, four 'A's Test.

### PDSA cycle 2

The 4AT was supplied on each ward in the hospice and staff were asked to complete a 4AT on the next five admissions if appropriate, that is, not if a patient was very unwell or clearly dying. It was agreed if a patient was admitted overnight a 4AT did not have to be completed at that point but should be performed within 24 hours of admission.

A 4AT was completed in three of the five admissions (60%) (figure 2). In the two cases where a 4AT was not completed it would not have been appropriate; in one case the patient was unconscious and in the second the patient was noted to be very breathless and anxious and subsequently died overnight. Feedback from staff was positive and they still agreed the 4AT was a usable tool and that it could easily be performed as part of a routine admission.

### PDSA cycle 3

The 4AT was incorporated into the admission paperwork. It was agreed cognitive assessment should be considered in 100% of patients admitted and a 4AT should be performed on all patients unless they are too unwell and, if this is the case, the reason why a 4AT is not completed should be documented.

Twelve consecutive admissions were subsequently reviewed. Cognitive assessment was considered in 100% (12) and a 4AT performed in 92% (11) (figure 2). Staff stated they valued having the 4AT in the admission notes and it was clear this had led to an increase in rates of both considering and performing cognitive assessment. Due to our patient cohort we would never expect a 100% completion rate but our standard should be we should consider cognitive assessment in 100% of patients.

### PDSA cycle 4

The results of the project so far were discussed at the hospice medical meeting and it was agreed we should continue having the 4AT in the admission paperwork.

Two weeks after cycle 3, a further 12 consecutive admissions were reviewed to see if the previous improvements had been sustained. Cognitive assessment was considered in 67% (8) and a 4AT performed in 50% (6) (figure 2). It was noted that some staff documented that a 4AT was not performed as the patient was not confused.

### PDSA cycle 5

Staff were further educated about the importance of screening all patients and documenting reasons where a 4AT is not used. The admission notes were adapted to state: 'If patient is conscious then please complete 4AT overleaf'. A 'Delirium Checklist' was also developed (figure 3) and discussed at our medical meeting. It was felt having a delirium checklist would be helpful as it would highlight priorities for delirium management with an additional prompt of common causes of delirium and suggested investigations. Staff feedback highlighted that it is essential we do not just identify patients with a possible delirium, but also manage this. If appropriate we should additionally investigate and treat reversible causes. It was agreed that, following a few adaptations, this would be printed on the back of the 4AT so it is easily accessible. The delirium checklist was subsequently incorporated into the admission documentation.

Reaudit was performed following the above changes. Thirty-five consecutive admissions were reviewed, but one set of notes was unavailable leaving 34 patients. Of 34 patients, cognitive assessment was considered in 85% (29) and performed in 76% (26) (figure 2). One patient had a Mini-Mental State Examination completed rather than a 4AT and was included in the above numbers as although they did not have a 4AT performed they still underwent cognitive assessment. In the three patients where cognitive assessment was considered but not performed the reason was stated; two patients were said to be minimally responsive and felt to be dying, one was documented as being asleep.

**DELIRIUM CHECKLIST**Please affix  
patient label here**Management:**

	Initial and date
<b>Regular observation</b>	
<b>Treat underlying cause if appropriate (common causes below)</b> e.g. pain, constipation, alcohol/nicotine withdrawal	
<b>Stop contributing drugs</b>	
<b>Good sensory environment</b> (ensure has glasses/hearing aids, well lit room during day, low level light at night, noise to a minimum, consider single room)	
<b>Educate and support family</b>	
<b>Regular orientation</b> (clocks/calendars, family/friends visiting, photos/familiar objects)	
<b>Promote mobility</b> where safe, avoid restraint	
<b>Staff continuity</b> when possible	
<b>Reduce need for wandering</b> – easy access to water/toilet/food, distraction, avoid restraint	
If speech rambling redirect/change subject/ "tactfully disagree"/acknowledge feelings	
<b>Restore uninterrupted sleep pattern</b> – use non-pharmacological measures where possible (a glass of warm milk or herbal tea, relaxation tapes or relaxing music, back massage)	
<b>Pharmacological management</b> only if necessary: haloperidol (not if Parkinson's or Lewy Body Dementia) ± lorazepam. Lowest dose for the shortest time.	
Is Adults With Incapacity Act form needed?	

**Is investigation for, and management of, reversible causes appropriate? If so, see common causes and suggested investigations below.**

**Common causes:**

<b>D</b>	<b>Drugs</b> (e.g. sedatives, opiates, antidepressants, anticholinergics, polypharmacy)
<b>E</b>	<b>Electrolyte imbalance/Endocrinology/Environmental change</b> (e.g. dehydration, hypo/hyperglycaemia, hypercalcaemia, renal/liver failure, vitamin deficiencies (e.g. B12/folate, thiamine), thyroid function, room change, hypo/hyperthermia)
<b>L</b>	<b>Lack of drugs</b> (withdrawal (e.g. drugs, alcohol, nicotine), uncontrolled pain)
<b>I</b>	<b>Infection/Intercurrent illness</b> (e.g. chest, urine)
<b>R</b>	<b>Reduced sensory input</b> (e.g. vision/hearing deficit, room too dark, too noisy)
<b>I</b>	<b>Intracranial</b> (e.g. stroke, subdural, brain metastases, intracranial infection, postictal)
<b>U</b>	<b>Urinary retention/Faecal impaction</b>
<b>M</b>	<b>Myocardial/Pulmonary/Mood</b> (e.g. myocardial infarction/angina/heart failure, pulmonary embolism/respiratory failure/hypoxia/hypercarbia, hypotension, anaemia, depression can cause cognitive impairment although unlikely a delirium)

**Investigation:**

	Initial and date
<b>Check observations</b> (temp, pulse, BP, sats, resp rate, blood sugar)	
<b>Full examination</b> (chest, abdomen, skin, CNS) ± PR/bladder scan	
Look for <b>signs of withdrawal</b> from drugs, alcohol, nicotine	
Look for evidence of <b>pain</b>	
<b>Bloods</b> – FBC, U&Es, LFTs, Ca, Alb, glucose, CRP. Consider TFT and B12/folate.	
<b>Urinalysis</b> ± MSU/CSU	
<b>Sputum culture</b> – if appropriate	
Review <b>medication</b> – anything just started or stopped?	
<i>Consider: CT head, ECG, CXR – cannot do in the hospice</i>	

**References:** ICU Delirium (2016); Why it matters; website (<http://www.icudelirium.co.uk/why-it-matters/>) [accessed 26/05/2016]; Geri-EM (2016); Causes of delirium; website (<http://geri-em.com/cognitive-impairment/causes-of-delirium/>) [accessed 26/05/2016]; NICE CKS (2016); Delirium; website (<http://cks.nice.org.uk/delirium/#scenario>) [accessed 26/05/2016]; Lishman, William Alwyn; Organic Psychiatry; 3<sup>rd</sup> Edition; Blackwell Science; Inc Malden Massachusetts 1998; Fong et al. Delirium in elderly adults: diagnosis, prevention and treatment. Nat Rev Neurol. 2009 April. 5(4): 210–220

Developed by Lucy Baird 26/05/2016. Reviewed by medical team 27/07/2016. Updated 28/07/2016.

**Figure 3** The delirium checklist that was printed on the back of the four 'A's Test (4AT).

## RESULTS

This QIP has found that the 4AT is a usable tool in assessing patients' cognitive state within the hospice setting. Over the course of the QIP, rates of considering performance of cognitive assessment increased (figure 2) from 0% before cycle 1 to 85% during cycle 5, and reached 100% during cycle 3. Rates of performance of cognitive assessment on admission rose from 0% to 76% across the study.

It is clear that incorporating the 4AT into the admission paperwork, changes to the admission paperwork itself (where completion of the 4AT is now suggested) and staff education, all had a part to play. Development of a delirium checklist, which was printed on the back of the 4AT, was also felt to be worthwhile, although the use of this in practice has not been assessed in this project.

Despite initial results suggesting poor sustainability, subsequent changes and repeated PDSA cycles have revealed our improvements have been sustained. Early identification of patients with delirium and subsequently earlier management will improve patient outcome.

## LESSONS AND LIMITATIONS

The aim of this project was to assess and improve cognitive assessment on hospice admission at a hospice inpatient unit. In order for this project to work it was important that both medical and nursing staff understood the project's importance and were supportive of its goals. It was essential that staff felt the chosen tool was usable within the hospice setting, both for them and our patients, and additionally that the chosen tool did not significantly increase paperwork. Although staff were generally enthusiastic regarding the changes, some staff were more willing to accept these than others. However, repeated feedback and staff education was valuable in overcoming this hurdle. Additionally, repeated use of the 4AT meant staff soon became familiar with the questions, making completion easier. Incorporation of the 4AT into the admission paperwork and inclusion of a statement suggesting 4AT completion both acted as visual prompts and further encouraged completion.

Following cycle 3 LB was on leave for 2 weeks and completion rates declined during this period. However, on LB's return momentum for the project was regenerated and further staff education was provided. Despite LB leaving the hospice between cycle 4 and cycle 5 there has been an improvement in rates of considering and performing cognitive assessment, which highlights the fact that the changes made are sustainable, and that the hospice staff continue to engage with the project.

This was a small project carried out on two wards in one hospice and consequently numbers were small. This project could be improved by looking at larger numbers of patients over a more prolonged time frame and also trialling introducing the 4AT in other hospices.

Although the delirium checklist was developed and felt to be useful by medical colleagues its use following being incorporated into the medical notes has not been assessed.

During this project it was noted that a key part of delirium management is family and patient education but, despite this, there is not a patient and relative information leaflet specifically about delirium in the palliative care setting. The development of such a leaflet would be particularly valuable.

## CONCLUSION

This QIP has improved cognitive assessment on patient admission to the hospice and although assessing the validity of the 4AT in the hospice setting was outside the scope of this project it has shown it is a usable tool in this patient population. The positive improvements made have been shown to be sustainable and will lead to improved patient outcome by improving early identification and subsequent treatment of delirium.

**Acknowledgements** The authors thank Dr Anne Finucane, Dr Patrick White, Laura Jackson and all medical staff, nursing staff and patients at the Marie Curie Hospice, Edinburgh.

**Contributors** LB: conception and design of the work, data collection, data analysis and interpretation, drafting the article, critical revision of the article and final approval of the version to be published. JAS: conception and design of the work, critical revision of the article and final approval of the version to be published.

**Funding** Marie Curie Hospice, Edinburgh.

**Competing interests** None declared.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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