

Audit of assessment and recognition of delirium among hospitalised older adults in uk hospitals

**Protocol for Round 2 – Retrospective delirium diagnosis**

Geriatric Medicine Research Collaborative

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# Key Dates

|  |  |
| --- | --- |
| 30 November 2018 | Protocol published*Centres should start registering the study* |
| 01 December 2018 | Centres should start collecting and entering data for Round 2 |
| 31 January 2018 | REDCap database locked*Planned deadline for data submission for Round 2* |

# Management Committee

|  |  |
| --- | --- |
| **Name** | **Role** |
| Dr Thomas Jackson | Delirium expert |
| Dr Carly Welch | Project oversight |
| Dr Lauren McCluskey | West Midlands representative |
| Dr Stephen Makin | Scottish representative |
| Dr Jennifer Burton | Scottish representative |
| Dr Sarah Richardson | North East representative |
| Dr Joanne Taylor | North West representative |
| Dr Oliver Todd | Yorkshire representative |
| Dr Ruth Willott | East Midlands representative |
| Dr Benjamin Jelley | Welsh Geriatricians’ Network – Wales representative |
| Dr Kelli Torsney | East of England representative |
| Dr Mustafa Aziz | Oxford, Thames Valley representative |
| Dr Victoria Gaunt | Severn representative |
| Dr Lindsay Ronan | Peninsula representative |
| Dr Jane Masoli | Peninsula representative |
| Dr Natalie Cox | Wessex representative |
| Dr Mary Ni Lochlainn | London representative |
| Dr Kumudhini Giridharan | Kent, Surrey, and Sussex representative |
| Dr Roisin Healy | Northern Ireland representative |
| Dr Peter Nightingale | Statistical support |

# Supporting organisations

This study has been supported by the West Midlands NIHR CRN and Birmingham Surgical Trials Consortium (BiSTC) through data management support. The Geriatric Medicine Research Collaborative has received funding from the West Midlands British Geriatrics Society (BGS) in the form of a start-up grant to cover running costs and patient and public involvement. No funding has been granted for this specific project.

# Background

## What is delirium?

Delirium is a common neuropsychiatric manifestation of physical illness. It is defined based on psychiatric reference criteria by the Diagnostic and Statistical Manual on Mental Disorders, Fifth Edition (DSM-V) (1). Cardinal symptomatology includes rapidly fluctuating disturbance of attention, awareness and cognition, with additional features such as visual hallucinations and sleep-wake cycle disruption often present (2). It is described by motor subtype, as: hyperactive, characterised by motor agitation, labile affect, perceptual differences and delusions; hypoactive, featuring predominant motor retardation and thought process abnormality; or mixed (3). Despite considerable implications for survival (4), distinguishing subtypes clinically remains challenging; concordance between different subtypes may be as low as one-third (5). A meta-analysis of 42 studies reported delirium to be prevalent on admission in 10–31% of medical inpatients (6). Prior to our study, the largest point prevalence study of delirium using DSM reference standard criteria demonstrated a prevalence of 19.6% amongst 280 general hospital adult inpatients (7).

Inpatient delirium has been associated with increased length of stay (LoS), institutionalisation, and distress to patients and their families (6). Additionally, delirium is associated with a future risk of dementia eight-fold (8). 38% of patients with delirium have been shown to have some form of undiagnosed pre-existent cognitive impairment (9). A downward spiral ensues as dementia increases risk of developing subsequent delirium, which is considered to worsen dementia outcomes (10). A previous prospective cohort study of 542 patients showed five-fold increased three-month mortality in patients with delirium compared to without, independent of causation (11). Despite high mortality, delirium is associated with significant healthcare expenditure; an additional cost associated with delirium management of $182 billion per year across 18 European countries has been estimated (2).

A widening understanding that early intervention in delirium improves outcome has motivated the development of quick, reliable screening tools. Accordingly, National Institute for Health and Care Excellence (NICE) Guidelines recommend that all patients aged 65 or over are screened for delirium upon admission (12). The 4AT is a validated tool, which can be completed by any healthcare professional in less than 2 minutes, without need for additional training (13). Subsequent diagnosis should be made by a specialist using DSM-V or CAM (Cognitive Assessment Method) criteria, recorded in the inpatient notes and communicated to the patient’s General Practitioner (12). Despite such clear guidance, delirium remains undiagnosed in up to three-quarters of inpatients (14, 15), precluding any attempt at effective management. The reasons why are unclear; however, incomplete understanding of delirium and the resultant educational needs of healthcare professionals, alongside avoidant behaviours towards a challenging patient group are likely contributory.

## NICE guidelines

NICE guidelines for delirium prevention, diagnosis, and management were produced in 2010. These guidelines recommend performing a risk factor assessment for all adults admitted to hospital. All older adults aged 65 years or older are considered to be at risk of delirium. NICE guidelines recommend that all at risk patients (i.e. all adults aged 65 years or older) should be assessed for evidence of delirium; if any symptoms or signs as present then the diagnosis should be made by a healthcare professional who is competent is diagnosis of delirium.

### 1.1 Risk factor assessment

1.1.1 When people first present to hospital or long-term care, assess them for the following risk factors. If any of these risk factors is present, the person is at risk of delirium.

* Age 65 years or older.
* Cognitive impairment (past or present) and/or dementia[[4](https://www.nice.org.uk/guidance/cg103/chapter/1-Guidance%22%20%5Cl%20%22ftn.footnote_4)]. If cognitive impairment is suspected, confirm it using a standardised and validated cognitive impairment measure.
* Current hip fracture.
* Severe illness (a clinical condition that is deteriorating or is at risk of deterioration)[[5](https://www.nice.org.uk/guidance/cg103/chapter/1-Guidance%22%20%5Cl%20%22ftn.footnote_5)].

1.1.2 Observe people at every opportunity for any changes in the risk factors for delirium.

### 1.2 Indicators of delirium: at presentation

1.2.1 At presentation, assess people at risk for recent (within hours or days) changes or fluctuations in behaviour. These may be reported by the person at risk, or a carer or relative. Be particularly vigilant for behaviour indicating hypoactive delirium (marked\*). These behaviour changes may affect:

* Cognitive function: for example, worsened concentration\*, slow responses\*, confusion.
* Perception: for example, visual or auditory hallucinations.
* Physical function: for example, reduced mobility\*, reduced movement\*, restlessness, agitation, changes in appetite\*, sleep disturbance.
* Social behaviour: for example, lack of cooperation with reasonable requests, withdrawal\*, or alterations in communication, mood and/or attitude.

If any of these behaviour changes are present, a healthcare professional who is trained and competent in diagnosing delirium should carry out a clinical assessment to confirm the diagnosis.

Figure 1 – Direct quotations taken from NICE guidance, Delirium: prevention, diagnosis and management, Clinical guideline [CG103], published July 2010.

All patients should have a risk factor assessment performed on admission to hospital. All at risk patients should then be screened for evidence of delirium. Where initial screening or assessment suggests evidence of delirium, a clinical assessment should be carried out by a healthcare professional who is trained and competent in diagnosing delirium.

In addition, NICE has produced quality standards for delirium in adults. This includes the statement that adults newly admitted to hospital who are at risk of delirium should be assessed for recent changes in behaviour, perception, physical function, and social behaviour. These quality standards also include the statement that adults with current or resolved delirium who are discharged from hospital should have their diagnosis of delirium communicated to their General Practitioner (GP). In the UK, it is common practice to communicate to the GP by a written discharge summary for all patients discharged from hospital. Therefore, it is expected that communication to the GP about the presence of delirium would normally be included on the discharge summary.



Figure 2 – NICE quality standards, Delirium in adults (QS63), July 2014.

NICE quality standards recommend assessing all at risk patients for changes that might suggest delirium (statement 1) and that adults with current or resolved delirium should have their diagnosis communicated to their GP on discharge (statement 5). Statements 2-4 are beyond the scope of this audit.

## Results of Round 1 Audit

***Please note that these results are currently unpublished. Please use these results only to guide your own local quality improvement strategies. These results will be published in a peer-reviewed journal. Please contact*** ***gemresearchuk@gmail.com*** ***before using these results.***

### Delirium screening

Overall 27.3% (410/1504) had been screened for delirium by the usual care team prior to our assessment. This ranged from 0-91.7% between individual sites. An admission under general or other surgery compared to acute medicine resulted in a reduced chance of delirium screening (OR 0.38, CI 0.21-0.69; p=0.002). An increased chance of delirium screening was associated with increased patient age (OR 1.04, CI 1.02-1.06; p<0.001), and the presence of a specialist local delirium team (OR 2.04, CI 1.48-2.79; p<0.001). Delirium screening was not affected by the presence of a screening tool in the clerking document, local delirium guidelines, local delirium leaflets, or a geriatric medicine team embedded into the admissions unit, or gender, dementia status, or frailty.

### Delirium prevalence

24.3% (366/1507) scored positive (4 or greater) with 4AT assessment. The prevalence of delirium was 15.2% (229/1507) including only cases of reference-standard delirium or 22.1% (333/1507) including cases of possible delirium. Prevalence between hospital sites was variable and ranged from 0-33.3%. Delirium prevalence was associated with increased age (OR 1.04, CI 1.02-1.06; p<0.001), dementia status (OR 1.91, CI 1.33-2.73, p<0.001), and frailty; frail (OR 4.20, CI 2.38-7.38; p<0.001), very frail (OR 8.40, CI 4.46-15.80; p<0.001). Delirium prevalence was not affected by any hospital factors, gender, or specialty.

### Delirium recognition

Of those in whom delirium was diagnosed using reference-standard criteria, 34.9% (80/229) had been recognised by the usual care team. Increased rates of screening were associated with increased rates of recognition, adjusting for confounders (OR 5.35, CI 2.66-10.80; p<0.001), although presence of a delirium team was associated with decreased chance of recognition (OR 0.40, CI 0.16-0.98; p=0.045). Delirium was less likely to be recognised in very frail compared to fit patients (OR 0.14, CI 0.03-0.61; p=0.009), and general, other, and orthopaedic surgery patients compared to acute medicine (OR 0.04, CI 0.01-0.36; p=0.004). Age, gender, and dementia status did not impact upon delirium recognition. Delirium recognition was not affected by delirium subtype.

### Discharge documentation

The discharge documentation was assessed for 169/229 patients with confirmed delirium. Delirium was documented on discharge summaries in 26.6% (45/169) of these. Documentation on discharge summaries was not affected by any hospital related factors, or patient related factors.

## Quality improvement methodology

All quality improvement has been implemented locally. We expect that this will include a combination of updates to local guidelines, and educational tools to increase awareness of delirium. To facilitate this process, we have created a shared drive that can be used for each site to add tools that they have used locally that may be adapted by others. This may include delirium guidelines, educational presentations, posters, or local leaflets.

The link for this shared drive is: goo.gl/DM2Amx

This audit will be open to all UK hospitals regardless of their participation in round 1. However, we will specifically collect information from sites that participated in round 1 to establish what changes were implemented locally. Individual sites will be responsible for assessing their own quality improvement methodology, but we will also assess if this can lead to successful quality improvement on scale.

Although the main focus is being driven locally, we are also making use of social media and presentations at national panspecialty meetings to increase awareness of delirium and the results of round 1 of our audit. This may also help to improve delirium screening, recognition, and discharge documentation on scale.

# Objectives

## Primary objective

To assess national compliance with NICE guidelines in terms of assessment and recognition of delirium amongst older hospitalised inpatients, with standards set as the national average from Round 1, or local standards from Round 1 if available.

## Secondary objectives

1. To establish hospital and patient factors that are most likely to improve delirium screening, recognition, and documentation on discharge summaries.
2. To assess the impact of local quality improvement methodology upon screening, recognition, and documentation on discharge summaries
3. To establish the point prevalence of delirium on September 14th as compared to March 14th
4. The establish the incidence of delirium during hospital admission in patients without delirium on admission
5. To assess the impact of delirium, delirium duration, and patient factors upon length of stay, and inpatient mortality
6. To assess the impact of recognition of delirium upon delirium duration, length of stay, and inpatient mortality

# Outcomes

## Primary outcomes – Audit standards

1. Adults aged 65 years and older should be screened for delirium within 48 hours of emergency hospital admission – *Audit standard (national) 27%*
2. Cases of delirium should be recognised and documented in the patient’s medical notes – *Audit standard (national) 34.9%*
3. Recognised cases of delirium should be communicated to the patient’s General Practitioner upon discharge – *Audit standard (national) 26.6%*

## Secondary Outcomes

We will conduct secondary data analysis to assess the impact of delirium upon the following outcomes:

* Mortality
	+ Odds of inpatient death and time to death analysis
* Length of stay
* Odds of institutionalisation

We will conduct separate secondary data analysis to assess the impact of recognition of delirium (when compared unrecognised delirium) upon the following outcomes:

* Mortality
	+ Odds of inpatient death and time to death analysis
* Length of stay
* Odds of institutionalisation

Our secondary data analysis will be performed to account for age, gender, dementia status, frailty status, and specialty.

# Rationale of audit

Although we appreciate that the only way to obtain an accurate understanding of true delirium prevalence and recognition is to assess patients in real time, there are also some significant downsides. Firstly, due to the timeframes of assessment, there may have been plans to screen the patient soon after (NICE guidelines do not recommend any clear timeframes of when delirium screening should be performed following hospital admission). Secondly, as all cases of identified delirium should be documented and acted upon, it is not possible to assess the impact of under-recognition on patient outcomes. Thirdly, this method allows detection of only prevalent delirium and not incident delirium, which develops during the hospital admission. Lastly, prospective screening and assessment requires a time-sensitive approach that limits the number of possible responses for each site. To address these methodological failings, our interim (Round 2) audit will be conducted retrospectively.

# Inclusion and exclusion criteria

## Inclusion criteria

* Aged 65 years or older at time of admission
* Emergency hospital admission (any specialty)
* Admitted to hospital between 00:00 – 23:59 on 14th September 2018

## Exclusion criteria

* Admitted to critical care
* Length of stay 2 days or less
* Elective admission
* Unable to obtain notes or logistical reasons

# Audit methodology

## Identification of patients meeting criteria

At most hospital sites it should be possible to identify a list of patients meeting the inclusion and exclusion criteria via the site informatics team. Sites would then be expected to request notes for all identified patients. It may be necessary to manually exclude some identified patients if they are found not to meet inclusion/exclusion criteria when notes are reviewed.

## Retrospective delirium diagnosis

Retrospective delirium diagnosis from the notes has been validated against gold-standard delirium diagnosis in previous studies (AUC 0.86) (16). This involves screening notes for evidence of delirium against DSM-V criteria. Evidence of all criteria is necessary to diagnose probable delirium. A diagnosis of possible delirium can be made when there is evidence from the notes of some but not all criteria. To facilitate this process, the guide below will be used to facilitate this process. A documented diagnosis of delirium will be considered as delirium regardless of other documentation. Where possible, the subtype will be ventured.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **a** | A disturbance in; i) Attention- reduced ability to direct, focus, sustain, and shift attention FROM: 20-1, MOYB (if done), comments including ”distractible”, “inattentive”, or similar  | **Yes** | No | ? |
|  |  OR ii) Awareness (reduced orientation to the environment) FROM: comments including “drowsy”, “agitated”, or similar |
| **b** | The disturbance; i) Develops over a short period of time (usually hours to a few days)  |  |  |  |
|  |  Ii) Represents a change from baseline attention & awareness  iii) tends to fluctuate in severity during the course of the day FROM: documentation as new problem by medical staff, or relative concern | **Yes** | No | ? |
| **c** | An additional disturbance in cognition (e.g. memory deficit, disorientation, language, visuospatial ability, or perception). FROM: AMTS, MOCA (if done), comments of “confusion”, or similar | **Yes** | No | ? |
| **d** | Exclusions- The disturbance in criteria A and C are; i) Better explained by another pre-existing, established, or evolving neurocognitive disorder, or ii) Occur in the context of a severely reduced level of arousal such as coma. FROM: History suggestive of progressive condition on admission OR severely obtunded patient e.g. in the context of Type 2 respiratory failure requiring ICU admission | Yes | **No** | ? |
| **e** | There is evidence from the history, physical examination or laboratory 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. FROM: Acute illness/precipitant of any description (should be yes for all patients) | **Yes** | No |  |
|  |  |
|  | **Probable Delirium Diagnosis – all items a,b,c and e ‘yes’, plus d ‘no’** | **Yes** | **No** |  |
|  | Possible delirium diagnosis – if any ‘?’ or e ‘no’ | Yes | No |  |

Figure 3 – Criteria used to diagnosis delirium from notes.

Guidance is given in red. Identification of these terms within the medical notes will be sufficient to diagnose delirium e.g. a newly confused agitated patient with pneumonia probably had delirium. By comparison, a single documentation of confusion but no documentation of impairment of consciousness or inattention will be considered possible delirium.

## Data collection

Data will be collected using the REDCap electronic data capture tools hosted at the University of Birmingham (17). REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. **No patient identifiable information will be recorded in REDCap.**

### Individual case data

The following details will be collected for all patients included in this audit:

* Age, gender
* Speciality (Acute medicine/ Geriatric medicine/ Other medicine/ Stroke/ Other surgery/ General surgery/ Orthopaedic surgery)
* Clinical frailty scale (from notes – 2 weeks prior to admission)
* Dementia (Y/N/Probable)
* Delirium screening performed within first 72 hours of admission (Y/N)
	+ If screening performed, by who? (FY1-CT2 or equivalent/ Geriatric registrar or consultant/ Other medical registrar or consultant/ Surgical registrar or consultant/ Nurse, allied health, or other
* Delirium diagnosis in notes (Y/N) – If Y, then no need to perform further retrospective methodology
* Probable delirium diagnosis – using retrospective diagnosis methodology (Y/N/possible)
* If delirium diagnosis in notes OR Y/possible from retrospective diagnosis
	+ Incident (i.e. hospital-acquired) or prevalent (i.e. present on admission)?
	+ Subtype? (Hypoactive/hyperactive/mixed/unknown)
	+ Delirium duration?
* Length of stay (days)
* Inpatient mortality (Y/N)
* Discharge destination – own home, previous care home, new care home, rehabilitation or other hospital

### Hospital-related information

Following completion of this audit and submission of data collection for individual patients, each site will be sent a site survey. This will be used to collect the following information:

* Excluded patients and reasons for this
* Specialist delirium team? (Y/N)
* Geriatric medicine service embedded into admissions unit? (Y/N)
* Local delirium guidelines (Y/N)
* Local delirium leaflet (Y/N)
* Delirium screening tool in clerking booklet? (Y/N)
* Participation in Round 1 (Y/N)
* Changes implemented locally following round 1 – free text option

The site survey will also be used to collect details of all local data collectors and collaborators.

## Planned statistical analysis

We will use logistic regression analysis to establish the effect of patient and hospital factors upon both prevalent and incident delirium, as well as screening and recognition. We will perform separate subgroup analysis to assess for change in screening, recognition, and discharge documentation across sites and nationally between rounds 1 and 2. We will use both logistic regression and cox regression to assess the impact of delirium, as well as recognition of delirium upon mortality. We will use robust analysis of covariance to assess the impact of delirium, as well as recognition of delirium upon LoS.

Local approvals / Ethical approval

This study should be registered as an audit at each participating centre. It is the responsibility of the local team to ensure that local audit approval is completed for their centre, and participating centres will be asked to confirm that they have gained formal approval at their site. REDCap logins will not be issued until approval has been confirmed. All audit members will be employed by their local hospital site and part of the clinical care team at site. They will access patient records only for approved audit purposes, approved by their local audit governance team. No data collection will commence at individual sites until the audit has been approved locally. Patient care will not be affected by this audit. Within Round 1, we previously discussed our audit methodology with the Birmingham South REC, and received a comfort letter. Ethical approval for secondary data analysis has been approved by the University of Birmingham ethical review committee (ERN\_18-1415).

Information governance

The initial search of identified patients will be maintained on local trust site computers and will not be removed off individual hospital sites. Where it is necessary to send information via email (e.g. from IT, or to other local audit members), this will be performed by NHSmail or internal NHS trust email accounts only. Paper proformas will be available for audit purposes, however, these will not be removed from individual hospital sites. Local data will be maintained on hospital computers and data will be protected as per the principles of GDPR. Anonymised information will be forwarded to the Geriatric Medicine Research Collaborative (GeMRC) for central collation and analysis through RedCap software. GeMRC will maintain the anonymised database of results. Secondary data analysis may be conducted on the fully anonymised database. Information about the local trust services in relation to delirium screening will be collected on a separate database sheet, collected via RedCap.

To facilitate data entry investigators may need a way to link REDCap records to patient records. This can be achieved by keeping a password protected spreadsheet, saved on trust computers only, containing a look-up table. This should cross-reference the automatically generated REDCap ID number for each patient against their local identifier. This link spreadsheet should never be printed. Local collaborators may wish to collect data on paper CRFs first. Paper copies should be destroyed as confidential waste within the centre once uploaded to REDCap. Collaborators will be given individual logins to REDCap; logins should not be shared.

# Authorship policy

The Geriatric Medicine Research Collaborative is a corporate author. All collaborators (including data collectors and site leads) will be included as collaborators on publications arising directly from this audit relating to retrospective delirium recognition. All collaborators who participate in two or more rounds of the delirium audit will be listed as collaborators in publications arising from quality improvement analysis.

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