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Delirium: a guide for the general physician

Authors: Oliver M Todd\textsuperscript{a} and Elizabeth A Teale\textsuperscript{b}

Delirium describes a sudden onset change in mental status of fluctuating course. This is a state of altered consciousness characterised chiefly by inattention or lack of arousal, but can also include new impairment of language, perception and behaviour. Certain predisposing factors can make an individual more susceptible to delirium in the face of a stressor. Stressors include direct insults to the brain, insults peripheral to the brain or external changes in the environment of an individual. Delirium is varied in its presentation, and can be categorised by the psychomotor profile as: hyperactive type (overly vigilant, agitated, often wandersome), hypoactive type (sedate or withdrawn) or mixed types.

KEYWORDS: Clinical management, delirium, detection, prevention, treatment

About delirium

Overall, prevalence of delirium on admission to hospital ranges between 10% and 31%\textsuperscript{1} but estimates vary according to the population measured. Prevalence is highest among those who are frail or patients who are critically unwell, for example patients on intensive care units, following surgery, or at the end of life. Over the age of 80 years, more than one third of those in hospital will experience delirium.\textsuperscript{2} Despite its high prevalence, delirium often goes undetected\textsuperscript{3} and undetected delirium is associated with the highest mortality.\textsuperscript{4}

Delirium heralds high risk of falls, longer inpatient stay, post-discharge institutionalisation, accelerated and lasting cognitive decline, and higher mortality.\textsuperscript{5} Perhaps most importantly for the affected person and their family, delirium can be a cause of significant distress.\textsuperscript{6}

Delirium is both common and dangerous, but current evidence suggests it is also preventable in about one third of cases,\textsuperscript{7} hence the growing emphasis on the adoption of multicomponent delirium prevention interventions. Delirium prevalence is not bound by specialty\textsuperscript{8} and crosses over to both hospital and community settings.\textsuperscript{9} Given its ubiquity and its heterogeneous presentation, delirium diagnosis and management is the responsibility of all clinicians.

Clinical management

Identify baseline function

Delirium is characterised by new changes to baseline mental state. Speaking to an informed caregiver or family member to establish the patient’s background cognitive function, physical function and independent ability to perform activities of daily living is therefore key to diagnosis. National Institute for Health and Care Excellence (NICE) guidelines recommend early identification of patients who are vulnerable as a result of non-modifiable risk factors, which lower the threshold for developing delirium (Box 1).\textsuperscript{9} Dementia is the most significant of these and the more advanced the dementia, the higher the risk.\textsuperscript{10} Dementia can be identified on admission with a high degree of accuracy (C-statistic 0.93)\textsuperscript{11} using the Informant Questionnaire of Cognitive Decline in the Elderly (IQCODE).\textsuperscript{12}

Suspect delirium early

Delirium is a state of altered consciousness, manifested primarily as impaired arousal (altered level of consciousness) and inattention (altered content of consciousness).\textsuperscript{13} It is a clinical diagnosis and requires fulfilment of five criteria according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (Box 2).\textsuperscript{14} The fifth criterion requires that a cause be found and this demands a full medical evaluation. A noteworthy exception may be where investigation is not appropriate (for example in palliative care).

Screening tests attempt to identify key features of delirium without which it is unlikely to be present. These tend to be simple, short and easy to embed into daily clinical practice. Asking a friend or relative the question ‘Do you think [the patient] has been more confused lately?’ has an 80% sensitivity for detecting delirium.\textsuperscript{15} Inattention, a cardinal feature of

Box 1. Predisposing factors in delirium

> Dementia
> Frailty
> Drug/alcohol dependence
> Sensory impairment
> Polypharmacy
> Multimorbidity
> Male sex
> Depression
Delirium, can be quickly identified by asking someone to recite the months of the year backwards. Failure to reach July on this test has a sensitivity of 83% and specificity of 91% for picking up delirium although specificity is reduced in patients with background dementia.

Delirium is a syndrome, therefore it is not usefully reducible to a single deficit, and a combination of tests demonstrates higher discrimination. The 4 As test (4AT) presents one such battery: it is well validated across different settings, brief and requires no training (Fig 1).

Where there is uncertainty about whether cognitive deficits are new, such patients should be treated as if delirium is present until evidence to the contrary is available. The fluctuating nature of delirium means that serial assessment is required. One difficulty is that repetition of cognitive assessments will be affected by a practice effect. Therefore, alongside cognitive tests, NICE guidelines recommend daily assessment of perception, and physical and social behaviour.

Perception can be measured by checking orientation to time, place and person, as well as screening for auditory and visual hallucinations. Physical and social behaviour can be categorised as hyper- or hypo-active delirium. Hyperactive behaviour, by its nature, demands attention of nursing staff and, therefore, tends to be diagnosed earlier, with a better prognosis. Hypo-active behaviour is characterised by reduced arousal; hence, it can be challenging to identify. Hypo-active delirium is also more common, particularly among older people, and carries with it a poorer prognosis.

Bedside observations of abnormal hand movements, ‘aimlessly picking at bedclothes’ or ‘plucking at the air’, show a high specificity for delirium of both hyper- and hypo-active subtypes.

Identify and treat triggers

A thorough history is required to elicit possible delirium precipitants, which themselves can be numerous and varied in one individual (Table 1). Attention should be paid to preventing modifiable factors, and attenuating the impact of non-modifiable risk factors. Patients with delirium often struggle to follow the commands of a traditional neurological exam, yet careful observation at the bedside may identify signs attributable to the underlying aetiology.

A full assessment of prescriptions, recent changes, over-the-counter or homeopathic remedies and adherence is required. Many medicines have delirigogenic side effects, particularly those with anti-cholinergic profiles (Box 3).

Sudden withdrawal of opiates, benzodiazepines and other sedatives may also cause delirium and if these medications are to be stopped, it should be done gradually.

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**Box 2. DSM-5 criteria for the diagnosis of delirium**

1. Disturbance in attention and awareness
2. Onset over a short period (hours to days) with tendency to fluctuate over the course of the day
3. Change in cognition or perceptual disturbance
4. Changes not accounted for by an established underlying disease or coma
5. Evidence from the history, examination or investigations that the disturbance is caused by a general medical condition.

**DSM-5 = Diagnostic and Statistical Manual of Mental Disorders, 5th edition**

**Table 1. Triggers for delirium**

<table>
<thead>
<tr>
<th>Precipitating factors</th>
<th>Central</th>
<th>Peripheral</th>
<th>Environmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct brain trauma</td>
<td>Vascular</td>
<td>Hypotension, myocardial infarct</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>Metabolic</td>
<td>Hypoglycaemia, dehydration, electrolyte disturbance, acidosis</td>
<td></td>
</tr>
<tr>
<td>Subdural haemorrhage</td>
<td>Vascular</td>
<td>Immobility</td>
<td></td>
</tr>
<tr>
<td>Epileptic seizure</td>
<td>Metabolic</td>
<td>Immobility</td>
<td></td>
</tr>
<tr>
<td>Encephalitis</td>
<td>Metabolic</td>
<td>Immobility</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
<td>Constipation</td>
<td>Emotional distress</td>
<td></td>
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<tr>
<td></td>
<td>Urinary retention</td>
<td>Sensory impairment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anaemia and nutrition</td>
<td>Sleep disturbance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Folate, B12, thiamine</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pain</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Fracture</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxins/toxin withdrawal</td>
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<td></td>
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<tr>
<td></td>
<td>Alcohol, drugs, anaesthetic</td>
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</tbody>
</table>

**Box 3. Medication classes with known delirium potential**

- Neuroleptic
- Opioid
- Benzodiazepine
- Anti-histamine
- Dihydropyridine
- H2 receptor antagonist
- Cardiac glycoside
- Steroid
- NSAID
- Tricyclic antidepressant
- Anti-parkinson

NSAID = Non-steroidal anti-inflammatory agent
Over-reliance on investigation in place of a thorough collateral history and careful examination can cause diagnostic delay, and the transfer across the hospital for multiple tests can cause added harm. Constipation, urinary retention and medications are common causes of delirium that may not cause abnormality in blood tests. Investigations should be pragmatic with the routine use of simple tests (Box 4). A step-wise approach to further investigation is best directed by the clinical history and examination findings.

**Management**

**Review daily**

Only by prioritising cognitive state alongside vital signs in handovers will clinicians become sufficiently aware to pick up new change. Screening for and modifying known risk factors for delirium has been shown to prevent incident delirium in approximately one third of patients across a variety of care settings and healthcare systems. Methods recommended by...
Box 4. Routine investigations for delirium

- Vital observations – RR, temperature, BP, pulse, sats
- Measure conscious level – AVPU
- Blood glucose
- Bloods – FBC, U&Es, Ca, LFTs, CRP
- Electrocardiogram
- Chest X-ray
- Arterial blood gas
- Urinalysis
- Culture urine/blood/fluid as appropriate
- Fluid balance

AVPU = conscious level score where A = alert, V = voice-responsive, P = pain-responsive and U = unresponsive; BP = blood pressure; Ca = calcium; CRP = C-reactive protein; FBC = full blood count; LFTs = liver biochemistry; RR = respiratory rate; sats = oxygen saturations; U&Es = urea and electrolytes

Table 2. Applications of NICE guideline CG103 on management of delirium

<table>
<thead>
<tr>
<th>Clinical factor</th>
<th>Goal</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition and/or disorientation</td>
<td>Older people-friendly environment</td>
<td>Appropriate lighting, clear signage, clock, calendar</td>
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<tr>
<td></td>
<td>Frequent orientation</td>
<td>Introduce oneself ('Hello My Name is…'),26 photos of family/memorabilia at bedside, empower whole team approach</td>
</tr>
<tr>
<td></td>
<td>Cognitively stimulating activities</td>
<td>Therapy, volunteer befriending, music consoles27</td>
</tr>
<tr>
<td></td>
<td>Access to family</td>
<td>John’s campaign to increase ward access to care-givers28</td>
</tr>
<tr>
<td>Dehydration and constipation</td>
<td>Adequate hydration</td>
<td>Regular assessment for fluid overload</td>
</tr>
<tr>
<td></td>
<td>Consideration of comorbidities in fluid status</td>
<td>Regularly asking about bowels, if necessary rectal exam to exclude impaction</td>
</tr>
<tr>
<td></td>
<td>Regular bowel movements</td>
<td></td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Optimisation of oxygenation</td>
<td>Spacers for inhalers or nebuliser adjuncts; titrated oxygen therapy</td>
</tr>
<tr>
<td>Infection</td>
<td>Active search for and early treatment of infection</td>
<td>Consider monitoring urine output via other means</td>
</tr>
<tr>
<td></td>
<td>Avoidance of unnecessary catheterisation</td>
<td>Use antimicrobials with low risk of C difficile, and eradicate MRSA in at-risk patients</td>
</tr>
<tr>
<td></td>
<td>Infection control</td>
<td></td>
</tr>
<tr>
<td>Immobility</td>
<td>Early mobilisation</td>
<td>Early discharge with enhanced home care teams where available29</td>
</tr>
<tr>
<td></td>
<td>Access to walking aids</td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>Regular assessment for pain</td>
<td>Assess non-verbal signs of pain, e.g. using the Abbey Pain Scale30</td>
</tr>
<tr>
<td></td>
<td>Appropriate analgesia</td>
<td>Routinely examine for pressure sores, back pain and bladder retention</td>
</tr>
<tr>
<td></td>
<td>Exclusion of hidden sources of pain</td>
<td></td>
</tr>
<tr>
<td>Medication review</td>
<td>Medicine consolidation</td>
<td>Review risk/benefit balance of primary and secondary prophylaxis</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Well-fitting dentures</td>
<td>Consider dietary supplements, vitamin D deficiency</td>
</tr>
<tr>
<td></td>
<td>Adequate nutrition</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safe swallow</td>
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</tr>
<tr>
<td>Sensory impairment</td>
<td>Quiet at night</td>
<td>Avoid evening caffeinated drinks, schedule medication/interventions around patient’s natural sleep cycle, reduce noise to a minimum at night</td>
</tr>
</tbody>
</table>

NICE are neither expensive nor time consuming, and broadly describe compassionate, patient-centred care.25 See Table 2 for practical examples. 26–30

Treat symptoms

Patients with very agitated behaviour should be managed using the least restrictive options. Asking family for information regarding a patient’s usual habits or familiar routines might help. Provision of a side room, one-to-one care and the encouragement of visiting by family are useful interventions.31 Good practice recommends regular engagement and communication with patient and family regarding changes to medication and care, and effort should be made to regularly assess capacity. Patients should be regularly asked about psychotic symptoms, distressing thoughts, delusional perceptions or hallucinations in a sensitive manner. When symptoms are particularly distressing or when patients present a risk to self or others and non-pharmacological means have been
ineffective or are inappropriate, consider medical therapy. There is evidence that benzodiazepines may cause harm. NICE guidelines and international consensus recommend anti-psychotic treatment at the lowest clinically appropriate dose, then titrated upwards, for no more than 1 week. Parkinson’s disease and Lewy body dementia are important contraindications and specialist advice should be sought.

Referral for specialist advice
Movement of patients from one ward to the next may exacerbate or precipitate delirium, so should be avoided if possible. If the delirium persists despite measures detailed above, consider referral to a geriatrician or liaison psychiatrist specialising in care of older people. The expertise of liaison psychiatry is particularly indicated where there is risk of harm to self or others; persistent need of one-to-one supervision; or in cases of agitated behaviour or distressing psychotic symptoms not responding to first-line therapy.

Follow-up
Prognosis can be difficult to predict in delirium. While median duration of delirium is reported as 1 week, delirium may not fully resolve until the patient returns to their home environment, and for one third of patients symptoms persist 3 months later. An episode of delirium is often an isolated incident, and yet a proportion of patients will never fully recover their pre-delirium cognitive baseline and there is an association with future dementia risk. In the context of this uncertainty, routine follow up of patients with delirium is vital to support patient and caregivers and to optimise recovery. Clear documentation and coding of delirium diagnosis are therefore essential in communications between secondary and primary care at discharge.

Conclusion
Delirium is common but remains neglected and underdiagnosed despite its significant impact upon the health of older people. Early identification of those most at risk can enable targeted methods to effectively prevent the evolution of delirium. There is a need for further research to better understand causal mechanisms as well as develop a stronger evidence base for treatment strategies. In the meantime, clinical practice must change in order to apply effective delirium prevention techniques.

Conflicts of interest
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References

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Delirium


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