Bedside Assessment of Delirium: Past, Present and Future

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PAST
Altered mental status in acute illness

- mood
- hallucinations
- level of arousal
- attention
- delusions
- coherent thinking
- language
- executive functioning
- memory
- sleep-wake
- motor activity
- visuospatial ability
What does bedside assessment consider?

- mood
- hallucinations
- level of arousal
- attention
- delusions
- coherent thinking
- memory
- executive functioning
- language
- sleep-wake
- motor activity
- visuospatial ability
- onset
- fluctuation
History of delirium assessment 1

Before 1980s, general clinical examination

Psychiatry-based methods

Skilled process

20-30 mins recommended for assessment in one textbook

Multiple domains assessed

Cognitive testing used to support
History of delirium assessment 2

DSM-III in 1980 (used term ‘delirium’)

Specific assessment tools emerged from 1980s onwards

Initially mostly suitable for research (complex, lengthy)

Shorter scales, eg. Confusion Assessment Method, from 90s
By 2017, >30 tools

Different purposes:

- Rapid clinical screening
- Severity
- Surveillance
- Etc.
<table>
<thead>
<tr>
<th>Instruments for assessment of arousability of the patient</th>
<th>RASS[^9]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruments for screening for premorbid cognitive disturbances</td>
<td>IQCODE[^11]</td>
</tr>
<tr>
<td>Screening instruments</td>
<td>NEECHAM Confusion Scale[^12]</td>
</tr>
<tr>
<td></td>
<td>Nursing Delirium Screening Scale[^13]</td>
</tr>
<tr>
<td></td>
<td>Delirium Observation Screening Scale/Delirium Observation Scale[^14,15]</td>
</tr>
<tr>
<td></td>
<td>Intensive care delirium screening checklist[^16]</td>
</tr>
<tr>
<td></td>
<td>Pediatric Anesthesia Emergence Delirium scale[^17]</td>
</tr>
<tr>
<td></td>
<td>Global Attentiveness Rating[^18]</td>
</tr>
<tr>
<td></td>
<td>Delirium Symptom Interview[^19]</td>
</tr>
<tr>
<td></td>
<td>Saskatoon Delirium Checklist[^20]</td>
</tr>
<tr>
<td></td>
<td>Delirium Rating Scale-revised version[^21]</td>
</tr>
<tr>
<td></td>
<td>Memorial Delirium Assessment Scale[^22]</td>
</tr>
<tr>
<td></td>
<td>Confusion Assessment Method[^23]</td>
</tr>
<tr>
<td></td>
<td>CAM-ICU[^24,25]</td>
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<tr>
<td></td>
<td>Paediatrics CAM-ICU[^26]</td>
</tr>
<tr>
<td>Diagnostic instruments</td>
<td>Clinical Assessment of Confusion - A and B[^27,28]</td>
</tr>
<tr>
<td>Instruments for Assessment of severity of delirium</td>
<td>Delirium Rating Scale[^29]</td>
</tr>
<tr>
<td></td>
<td>Delirium Rating Scale-Revised-98[^30]</td>
</tr>
<tr>
<td></td>
<td>Confusion Assessment Method[^31]</td>
</tr>
<tr>
<td></td>
<td>Confusion Assessment Method for Intensive Care Unit assessment tool[^24,25]</td>
</tr>
<tr>
<td></td>
<td>Delirium-O-Meter[^32]</td>
</tr>
<tr>
<td></td>
<td>Delirium Index[^33]</td>
</tr>
<tr>
<td></td>
<td>Memorial Delirium Assessment Scale[^34]</td>
</tr>
<tr>
<td></td>
<td>Confusional State Evaluation Scale[^35]</td>
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<tr>
<td></td>
<td>Delirium Assessment Scale[^36]</td>
</tr>
<tr>
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<td>Delirium Severity Scale[^37]</td>
</tr>
<tr>
<td>Instruments for assessment of cognitive symptoms only</td>
<td>Mini Mental Status Examination[^38]</td>
</tr>
<tr>
<td></td>
<td>Cognitive Test for Delirium[^39,40]</td>
</tr>
<tr>
<td></td>
<td>Clock Drawing test[^38]</td>
</tr>
<tr>
<td></td>
<td>Digit Span Test[^39,41]</td>
</tr>
<tr>
<td></td>
<td>Vigilance “A” Test[^42]</td>
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<tr>
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<td>Mental state Questionnaire[^41,42]</td>
</tr>
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<td>Short Portable Mental Status Questionnaire[^43]</td>
</tr>
<tr>
<td>Motor symptoms</td>
<td>Delirium Motor Checklist, Delirium Motor Symptom Scale[^44,45]</td>
</tr>
<tr>
<td></td>
<td>Richmond Agitation and Sedation Scale[^46]</td>
</tr>
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<td>Motoric items of Delirium Rating Scale, Delirium Rating Scale-Revised-98,</td>
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<td>Etiology, risk factors</td>
<td>Delirium Etiology Checklists[^47]</td>
</tr>
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<td>Paediatric delirium</td>
<td>Pediatric Anesthesia Emergence Delirium scale[^17]</td>
</tr>
<tr>
<td>Distress with delirium experience</td>
<td>Delirium Experience Questionnaire[^47]</td>
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Cognitive testing

Several studies of cognition in delirium

Attention: many tools assessed, eg. digit span

Used to support overall Dx; no numerical thresholds
Objective assessment of attention in delirium: a narrative review

Zoë Tieges\textsuperscript{1,2}, Laura J. E. Brown\textsuperscript{3} and Alasdair M. J. MacLullich\textsuperscript{1,2}

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The neuropsychology of delirium: advancing the science of delirium assessment

Zoë Tieges\textsuperscript{1,2}, Jonathan J. Evans\textsuperscript{3}, Karin J. Neufeld\textsuperscript{4} and Alasdair M.J. MacLullich\textsuperscript{1,2}

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Impact on clinical practice

Increasing awareness

Appearance of tools like CAM, DOSS in clinical protocols

Some evidence of clinical use & impact

Rates of delirium detection very low (<20%)
Focus on diagnostic criteria

Acute onset

Fluctuating course

Inattention

Other cognitive deficits

.... less coverage of mood, psychosis
PRESENT
Present status of delirium assessment

Chaotic picture

Recent UK survey (N=2300): 60% have guidelines

But followed in a minority

Still <20% of delirium detected
Signs of encouragement?

National/international guidelines (eg. NICE in UK)

Increasingly a target for implementation

Tools with more focus on clinical use

Delirium superimposed on dementia work

Level of arousal / untestability issue addressed
Table 2. Delirium Rating Scale (DRS) and cognitive test results

<table>
<thead>
<tr>
<th>Diagnostic group</th>
<th>Mini-Mental State (mean ± SD)</th>
<th>Trailmaking A (mean ± SD)</th>
<th>Trailmaking B (mean ± SD)</th>
<th>DRS (mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delirium (n = 20)</td>
<td>12.0 ± 9.3</td>
<td>125 ± 61¹</td>
<td>330 ± 122¹</td>
<td>23.0 ± 4.8²</td>
</tr>
<tr>
<td>Dementia (n = 9)</td>
<td>20.0 ± 4.9</td>
<td></td>
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<td>4.6 ± 2.1²</td>
</tr>
<tr>
<td>Schizophrenia (n = 9)</td>
<td>23.6 ± 4.5</td>
<td>89 ± 42</td>
<td>240 ± 123</td>
<td>3.3 ± 1.6²</td>
</tr>
<tr>
<td>Normal (n = 9)</td>
<td>27.4 ± 2.9</td>
<td></td>
<td></td>
<td>0.67 ± 0.5²</td>
</tr>
</tbody>
</table>

1. Only 9 delirious subjects could attempt the Trailmaking Test.
2. p < 0.001 by one-way analysis of variance.
Range of level of arousal

Normal function

Range of abnormalities of cognition: quantifiable

'Untestable' with most cognitive tests

Coma

Range of delirium severity
Validation of the 4AT, a new instrument for rapid delirium screening: a study in 234 hospitalised older people

Bellelli et al., Age Ageing, 2014

N=234 consecutive older patients

Acute geriatrics and rehabilitation settings

4AT compared against reference standard
<table>
<thead>
<tr>
<th>Sensitivity and Specificity</th>
<th>Score</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full Score</strong></td>
<td>4 or above</td>
<td>89.7%</td>
<td>84.1%</td>
</tr>
<tr>
<td><strong>Alertness</strong></td>
<td>4</td>
<td>53.2%</td>
<td>96.1%</td>
</tr>
<tr>
<td><strong>AMT4</strong></td>
<td>1</td>
<td>96.6%</td>
<td>54.6%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>89.7%</td>
<td>80.2%</td>
</tr>
<tr>
<td><strong>Attention</strong></td>
<td>1</td>
<td>93.1%</td>
<td>49.8%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>86.2%</td>
<td>82.6%</td>
</tr>
<tr>
<td><strong>Acute change/Fluctuation</strong></td>
<td>4</td>
<td>69.0%</td>
<td>94.2%</td>
</tr>
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FUTURE
Aiming high...

All delirium detected and monitored until resolution

Specific features in individual patients assessed and treated
Learning from the past

“The existence and the diagnostic criteria, as well as the clinical importance of delirium, have not been sufficiently emphasised in the teaching of medical students and residents.”

Lipowski, 1990
Learning from the past

Good assessment methods $\neq$ implementation

Even good education $\neq$ implementation
Effective bedside assessment of delirium
Effective bedside assessment of delirium

Culture
Attitudes
Quality control
Basic knowledge in practitioners
Skills
Rx after Dx
Institutional knowledge + support
Future: a system of assessments

SCREENING
Rapid, pragmatic
Routine staff can use

DIAGNOSIS
(Unclear)
May be same process as screening

INDIVIDUAL FEATURES
Symptom domains
Mood, psychosis, etc.

SURVEILLANCE
For incident delirium

MONITORING FOR RECOVERY
Tracking symptoms
Serial cognitive testing
Screening

For use in routine care by mostly non-specialist staff

Fast, simple, easy to train

Focused on diagnostic features (onset, inattention)

NB informant history not always necessary (dangerous to wait)

In some cases screening leads directly to diagnosis
Diagnosis

Staff with sufficient training

Screening tool then **clinical judgement**

Additional tool not usually possible in routine care
“Delirium is usually accompanied by profound affective changes.”

Koponen, Rockwood, & Powell, 2001
Distress: why is it not formally assessed?
Not just diagnosis: assess features of delirium

What is this patient’s delirium like?

(Restoring some of the traditional approaches)
Altered mental status in acute illness

- mood
- hallucinations
- level of arousal
- attention
- delusions
- coherent thinking
- memory
- language
- executive functioning
- visuospatial ability
- sleep-wake
- motor activity
Not just diagnosis: assess **features of delirium**

What is this patient’s delirium like?

(Restoring some of the traditional approaches)

- Cognition
- Level of arousal
- Anxiety
- Low mood
- Fear, uncertainty
- Delusions
- Hallucinations
- Etc.
Features of a patient’s delirium

Individualised treatment plan
Specific features and delirium Rx: examples

Distress

Missing a relative, delusions, disorientation, pain, retention
Leads to specific actions including psychological interventions

Reduced arousal

Swallowing assessment (aspiration risk), pressure sores, dehydration, malnourishment, no rehabilitation, etc.

Increased arousal

Falls, risk of leaving ward, may not accept drugs/fluids, risk of over-sedation if no clear plan, no rehabilitation, etc.
Surveillance of non-delirious high risk patients

~50% of delirium arises after hospital admission

Nursing home, palliative care populations

Staff training to be aware of CHANGE

Tools

- Delirium Observation Screening Scale
- RADAR
- Arousal assessments
Monitoring for recovery

Based on individual features of a patient’s delirium

Monitoring of resolution of these features

Repeated level of arousal assessments (eg. RASS)

Repeated cognitive assessments (eg. DelApp)

Motor control assessments (eg. Trunk Control Test)

EEG in some patients
Conclusions and future work
Conclusions

Since 1980s, many developments in delirium assessment

Now, several useful, validated tools for different purposes

Assessment is chaotic and patchy

But delirium still poorly detected

Improvements will depend on:

*Culture, attitudes, education (practitioners + organisations)*

Organised, explicit systems of assessment

Processes for: screening, Dx, features, surveillance, monitoring for recovery