

# Bedside Assessment of Delirium: Past, Present and Future

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**PAST**

# Altered mental status in acute illness

level of  
arousal

attention

delusions

coherent  
thinking

mood

language

memory

executive  
functioning

hallucinations

visuospatial  
ability

sleep-wake

motor  
activity

# What does bedside assessment consider?

level of arousal

attention

delusions

coherent thinking

mood

language

memory

ONSET

FLUCTUATION

executive functioning

hallucinations

visuospatial ability

sleep-wake

motor activity

# **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**

# History of delirium assessment 3

**By 2017, >30 tools**

**Different purposes:**

**Rapid clinical screening**

**Severity**

**Surveillance**

**Etc.**

Instruments for assessment of arousability of the patient	RASS <sup>[9]</sup>
Instruments for screening for premorbid cognitive disturbances	IQCODE <sup>[10,11]</sup>
Screening instruments	NEECHAM Confusion Scale <sup>[12]</sup>
	Nursing Delirium Screening Scale <sup>[13]</sup>
	Delirium Observation Screening Scale / Delirium Observation Scale <sup>[14,15]</sup>
	Intensive care delirium screening checklist <sup>[16]</sup>
	Pediatric Anesthesia Emergence Delirium scale <sup>[17]</sup>
	Global Attentiveness Rating <sup>[18]</sup>
Diagnostic instruments	Delirium Symptom Interview <sup>[19]</sup>
	Saskatoon Delirium Checklist <sup>[20]</sup>
	Delirium Rating Scale-revised version <sup>[21]</sup>
	Memorial Delirium Assessment Scale <sup>[22]</sup>
	Confusion Assessment Method <sup>[23]</sup>
	CAM-ICU <sup>[24,25]</sup>
	Paediatrics CAM-ICU <sup>[26]</sup>
	Clinical Assessment of Confusion - A and B <sup>[27,28]</sup>
	Delirium Rating Scale <sup>[29]</sup>
	Delirium Rating Scale-Revised-98 <sup>[21]</sup>
	Confusion Assessment Method <sup>[23]</sup>
	Confusion Assessment Method for Intensive Care Unit assessment tool <sup>[24,25]</sup>
	Delirium-O-Meter <sup>[30]</sup>
	Delirium Index <sup>[31]</sup>
	Memorial Delirium Assessment Scale <sup>[22]</sup>
	Confusional State Evaluation Scale <sup>[32]</sup>
	Delirium Assessment Scale <sup>[33]</sup>
	Delirium Severity Scale <sup>[34]</sup>
Instruments for Assessment of severity of delirium	Mini Mental Status Examination <sup>[35]</sup>
	Cognitive Test for Delirium <sup>[36,37]</sup>
	Clock Drawing test <sup>[38]</sup>
	Digit Span Test <sup>[39,40]</sup>
	Vigilance "A" Test <sup>[40]</sup>
	Mental state Questionnaire <sup>[41,42]</sup>
	Short Portable Mental Status Questionnaire <sup>[43]</sup>
	Delirium Motor Checklist, Delirium Motor Symptom Scale <sup>[44,45]</sup>
	Richmond Agitation and Sedation Scale <sup>[9]</sup>
	Motoric items of Delirium Rating Scale, Delirium Rating Scale-Revised-98,
	Memorial Delirium Assessment Scale <sup>[21,22,29]</sup>
	Delirium Etiology Checklist <sup>[46]</sup>
	Pediatric Anesthesia Emergence Delirium scale <sup>[17]</sup>
	Delirium Experience Questionnaire <sup>[47]</sup>
Etiology, risk factors	
Paediatric delirium	
Distress with delirium experience	



# **Cognitive testing**

**Several studies of cognition in delirium**

**Attention: many tools assessed, eg. digit span**

**Used to support overall Dx; no numerical thresholds**

REVIEW ARTICLE

International Journal of  
Geriatric Psychiatry

## Objective assessment of attention in delirium: a narrative review

Zoë Tieges<sup>1,2</sup>, Laura J. E. Brown<sup>3</sup> and Alasdair M. J. MacLulich<sup>1,2</sup>

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SPECIAL ISSUE PAPER

International Journal of  
Geriatric Psychiatry

## The neuropsychology of delirium: advancing the science of delirium assessment

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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**

<b>Diagnostic group</b>	<b>Mini-Mental State (mean <math>\pm</math> SD)</b>	<b>Trailmaking A (mean <math>\pm</math> SD)</b>	<b>Trailmaking B (mean <math>\pm</math> SD)</b>	<b>DRS (mean <math>\pm</math> SD)</b>
Delirium ( <i>n</i> = 20)	12.0 $\pm$ 9.3	125 $\pm$ 61 <sup>1</sup>	330 $\pm$ 122 <sup>1</sup>	23.0 $\pm$ 4.8 <sup>2</sup>
Dementia ( <i>n</i> = 9)	20.0 $\pm$ 4.9			4.6 $\pm$ 2.1 <sup>2</sup>
Schizophrenia ( <i>n</i> = 9)	23.6 $\pm$ 4.5	89 $\pm$ 42	240 $\pm$ 123	3.3 $\pm$ 1.6 <sup>2</sup>
Normal ( <i>n</i> = 9)	27.4 $\pm$ 2.9			0.67 $\pm$ 0.5 <sup>2</sup>

1. Only 9 delirious subjects could attempt the Trailmaking Test.

2.  $p < 0.001$  by one-way analysis of variance.



**Normal function**



**Range of level of arousal**



**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**

# Sensitivity and Specificity

	<b>Score</b>	<b>Sensitivity</b>	<b>Specificity</b>
<b>Full Score</b>	<b>4 or above</b>	<b>89.7%</b>	<b>84.1%</b>
<b>Alertness</b>	<b>4</b>	<b>53.2%</b>	<b>96.1%</b>
<b>AMT4</b>	<b>1</b>	<b>96.6%</b>	<b>54.6%</b>
	<b>2</b>	<b>89.7%</b>	<b>80.2%</b>
<b>Attention</b>	<b>1</b>	<b>93.1%</b>	<b>49.8%</b>
	<b>2</b>	<b>86.2%</b>	<b>82.6%</b>
<b>Acute change/Fluctuation</b>	<b>4</b>	<b>69.0 %</b>	<b>94.2%</b>

**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

**Infrastructure**

**Infrastructure**

**Effective bedside  
assessment of  
delirium**

**Infrastructure**

**Infrastructure**



**Culture**

**Basic knowledge in  
practitioners**

**Attitudes**

**Effective bedside  
assessment of  
delirium**

**Skills**

**Quality control**

**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

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# **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**