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• If you cannot hear sound, try the following:
  1. Check the “Hardware and Sound” folder in your computer’s “Control Panel” – check if you are muted, if the volume is set at a good level, and if your playback device is set to be the system’s “default”
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  3. Close and restart the webinar in a different browser (Internet Explorer vs. Google Chrome vs. Mozilla Firefox)
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RGP of Toronto Network Webinar

Delirium Screening in Clinical Practice
Mind the Gap!

March 13 2018

Dr. Niamh O’Regan, MB BCH BAO, BMedSci, MRCPI, PhD
Consultant Geriatrician and Clinician Researcher
Schulich School of Medicine and Dentistry, Western University
Delirium Screening: Mind the Gap!

Niamh O’Regan, MB BCh BAO, PhD
Assistant Professor, Geriatric Medicine, Western University

March 13th, 2018
Disclosures:

- **Grants / Research support:** Health Research Board, Ireland; AMOSO Ontario
- **Conflicts of Interest:** none
First and foremost!

The second annual World Delirium Awareness Day is taking place tomorrow!!

A Social Media Campaign for Advocacy of Delirium Awareness

#WDAD2018
@iDelirium_Aware
www.idelirium.org
#deliriumeh, #WDAD2018

Participate and encourage others to follow, tag, tweet and retweet our twitter feed on @iDelirium_Aware.

We want your:
- Pictures of what your team is doing on #WDAD2018
- Graphics
- Memes
- Artwork
- “Winning” stories
Outline

• The “problem” of delirium
• Why we need to actively screen for delirium
• Knowledge translation gap
• What do we know about the feasibility of instruments and how can we measure this?
• Characteristics of a feasible screening instrument?
The Delirium Problem....
It’s extremely common...
It’s extremely common...

<table>
<thead>
<tr>
<th>Population</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult hospital inpatients</td>
<td>~20%</td>
</tr>
<tr>
<td>Older inpatients</td>
<td>~50%</td>
</tr>
<tr>
<td>ICU patients</td>
<td>~80%</td>
</tr>
<tr>
<td>Palliative Care patients</td>
<td>Up to 88%</td>
</tr>
<tr>
<td>Long-term care patients</td>
<td>Up to 70%</td>
</tr>
<tr>
<td>Hip fracture patients</td>
<td>Up to 62%</td>
</tr>
<tr>
<td>Inpatients with dementia</td>
<td>Up to 89%</td>
</tr>
</tbody>
</table>
It’s really serious...
It’s really serious...

Independent of the underlying illness, delirium leads to...

- Increased hospital stay (an extra ~10 days)
- Increased healthcare costs (costs doubled)
- Falls (Increased risk of in-hospital Falls and post d/c x 3.5)
- Cognitive decline (Increased risk of dementia)
- Increased mortality (increased 11% for each additional 48 hours of delirium)
- Increased need for nursing home (risk >doubled)

Increased mortality (increased 11% for each additional 48 hours of delirium)
It’s missed a lot!
<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Missed Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fang et al (2008)</td>
<td>Pall care patients</td>
<td>55% missed</td>
</tr>
<tr>
<td>Han et al (2009)</td>
<td>Elderly ER attenders</td>
<td>76% missed</td>
</tr>
<tr>
<td>Collins et al (2010)</td>
<td>Elderly med admission</td>
<td>72% missed</td>
</tr>
<tr>
<td>Ryan et al (2013)</td>
<td>Gen hosp point prevalence</td>
<td>56% missed</td>
</tr>
<tr>
<td>Stelmokas et al (2016): Post-acute Rehab</td>
<td></td>
<td>68% missed</td>
</tr>
<tr>
<td>Traynor et al (2016): Aged Care Emergency Services</td>
<td></td>
<td>86% missed</td>
</tr>
</tbody>
</table>
Missed delirium worse outcomes

- 11% increase in mortality with every 48 hours of undetected delirium

- 30% mortality at 6 months in older patients discharged from the ED with undetected delirium (v’s 14% detected delirium v’s 11% no delirium)

Gonzalez et al, Psychosomatics, 2011; Kakuma et al, JAGS 2003
The delirium “problem”

It’s extremely common
The delirium “problem”

It’s extremely common → We need to prevent it (about half is preventable!)
The delirium “problem”

It’s extremely common → We need to prevent it (about half is preventable!)

It’s really serious
The delirium “problem”

It’s extremely common → We need to prevent it (about half is preventable!)

It’s really serious → We need to find out how to treat it effectively

We miss it a lot
The delirium “problem”

It’s extremely common → We need to prevent it (about half is preventable!)

It’s really serious → We need to find out how to treat it effectively

We miss it a lot → We need to find accurate ways to detect it
We don’t tend to miss myocardial infarction for example...

Why do we miss delirium?
Delirium is complex!

Barriers to Delirium Diagnosis
Barriers to Delirium Diagnosis

- Fluctuating nature
- Hypoactive profile
- Differentiating delirium / dementia
- Communication barriers
- Lack of education
- Poor understanding
- Inadequate use of tools
- Burden of Care
- Time constraints
- Workload concerns
- Documentation burden
- An orphan condition
- Lack of physician support
- Poor leadership
- Cultural ageist attitudes

This is why we need to actively screen for delirium...
Two-step screening approach widely recommended

- Royal College of Physicians 2010 (UK)
- British Geriatrics Society 2006
- Australian guidelines 2006
- Canadian Guidelines for Seniors Mental Health 2006

NICE National Institute for Health and Care Excellence 2010
What does that mean?

Step 1: Screening at risk patients

Step 2: More in-depth assessment of those who screen positive
What does that mean?

Step 1: Screening at risk patients

Step 2: More in-depth assessment of those who screen positive
Screening test

Diagnostic test
Ontario

SFH framework 2011

3 priority areas for action

• Delirium
• Functional Decline
• Transitions of Care
SFH ACTION

- Large-scale evaluation of indicators monitoring delirium and functional decline practice in 44 hospital organisations
- Identified learning needs important for QI success
- SFH ACTION

[Quality Improvement Projects Being Implemented by SFH ACTION Hospitals (90 Projects)*]

- Early Mobilization (27%)
- Delirium (43%)
- Nutrition (3%)
- Responsive Behaviours (4%)
- Catheter Use (3%)
- Restraint Use (2%)
- Falls (3%)
- Sleep (2%)
- Care Transitions (3%)
- Patient Experience (3%)
- Other (4%)

* 86 participating hospitals are implementing 90 projects
Ontario

SFH framework 2011

3 priority areas for action

- Delirium
- Functional Decline
- Transitions of Care

Implement inter-professional delirium screening, prevention, and management protocols across hospital departments to optimize cognitive function
Ontario

SFH framework 2011

3 priority areas for action

• Delirium
• Functional Decline
• Transitions of Care

Daily screening in at risk patients
Which test?

Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: a systematic review

Eveline L. van Velthuijsen¹, Sandra M. G. Zwakhalen¹, Ron M. J. Warnier¹,², Wubbo J. Mulder², Frans R. J. Verhey³ and Gertrudis I. J. M. Kempen¹

Literature Review

Delirium Screening: A Systematic Review of Delirium Screening Tools in Hospitalized Patients

Jayita De, BSc, MBBS, FRACP,¹ and Anne P. F. Wand, BSc, MBBS, MPsychiatry, FRANZCP²,³
Which test?

Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: a systematic review

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Most instruments not designed, nor validated, for daily screening by ward staff in a busy acute setting

Literature Review

Delirium Screening: A Systematic Review of Delirium Screening Tools in Hospitalized Patients

Jayita De, BSc, MBBS, FRACP and Anne P. F. Wand, BSc, MBBS, MPsychiatry, FRANZCP
Confusion Assessment Method

- Most widely used (clinical / research)
- Most adapted (language / setting / mode / user)
- Accurate (when used by the right person)
- Recommended for screening in Canada

Wong et al, JAMA 2010; Wei et al, JAGS 2008; Shi et al, Neuropsychiatr Dis Treat 2013
Confusion Assessment Method

Clarifying Confusion: The Confusion Assessment Method
A New Method for Detection of Delirium

Sharon K. Inouye, MD, MPH; Christopher H. van Dyck, MD; Cathy A. Alessi, MD; Sharyl Balkin, MD; Alan P. Siegal, MD; and Ralph I. Horwitz, MD


Based on DSM-III-R

A “Diagnostic” Algorithm
Confusion Assessment Method

Feature 1. Acute onset and fluctuating course
Feature 2. Inattention
Feature 3. Disorganised Thinking
Feature 4. Altered level of alertness

Delirium = (1 plus 2) plus (3 or 4)
Clarifying Confusion: The Confusion Assessment Method

A New Method for Detection of Delirium

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Table 3. The Sensitivity, Specificity, and Predictive Accuracy of the Confusion Assessment Method (CAM)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Patients at Site 1</th>
<th>Patients at Site 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N (%) [95% CI]</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>10/10 (100) [66-100]</td>
<td>15/16 (94) [68-100]</td>
</tr>
<tr>
<td>Specificity</td>
<td>19/20 (95) [73-100]</td>
<td>9/10 (90) [54-100]</td>
</tr>
<tr>
<td>Positive predictive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>accuracy</td>
<td>10/11 (91)</td>
<td>15/16 (94)</td>
</tr>
<tr>
<td>Negative predictive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>accuracy</td>
<td>19/19 (100)</td>
<td>9/10 (90)</td>
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Confusion Assessment Method

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Ease of Use

The standardized interviews, including cognitive testing, administered by the geriatricians (S.K.I., C.A.A.) took a mean of 20 minutes and were well tolerated.
Screening test

Diagnostic CAM test
Screening CAM test

Diagnostic CAM test
Confusion Assessment Method

- **Screening challenges:**
  - Low sensitivity when
    - minimally trained
    - formal cognitive test not conducted
  - Low specificity when
    - high rates of dementia / psych diagnosis
  - Takes ~5 mins
  - Need knowledge of baseline state

Wei et al, JAGS 2008
Confusion Assessment Method

• Screening challenges:
  – Low sensitivity when
    • minimally trained
    • formal cognitive test not conducted
  – Low specificity when
    • high rates of dementia / psych diagnosis
  – Takes ~5 mins
  – Need knowledge of baseline state

So.....Daily Screening by Routine Ward Staff???
Diagnostic accuracy

Feasibility to implement clinically
Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: a systematic review

Eveline L. van Velthuijsen¹, Sandra M. G. Zwakhalen¹, Ron M. J. Warnier¹,², Wubbo J. Mulder², Frans R. J. Verhey³ and Gertrudis I. J. M. Kempen¹

- **43 studies, 28 instruments**
  - 10 instruments *designed* for screening purposes
    - DOS, FAM-CAM, I-Aged, ICDSC (ICU), Inter-RAI, Nu-DESC, SQiD, SQeeC, DTS, mRASS
  - 5 were evaluated in 3 or more studies:
    - DOS, Nu-DESC, CAM, CAM-ICU, DRS-R98
  - 6 instruments evaluated in 7 studies in which the instruments were applied by staff nurses
    - DOS, NuDESC, mCAM-ED, CAM, DOM, NEECHAM
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• **Diagnostic accuracy** poor for some instruments
  – e.g. CAC sensitivity 36%

• **Feasibility** examined very superficially:
  – Number of test items (range 1-25)
  – Duration of test - available for 18 instruments (<20s - <15 mins)
  – Cost - reported for 21 instruments (all free)
  – Whether or not training was needed – reported for all (majority Yes / 7 No)
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The studies of feasibility largely have not been done!
Feasibility also includes…

- Staff acceptability and adherence
- Patient and caregiver acceptability
- Refusal / withdrawal rates
- ‘Real-world’ test psychometrics
- ‘Real-world’ reliability and validity
A closer look....

• at 3 studies that evaluated elements pertaining to feasibility

• what did they examine?
Elements pertaining to feasibility of screening – other instruments studied

- NEECHAM
- DOSS
- mCAM – ED
- RADAR
The Neecham Confusion Scale and the Delirium Observation Screening Scale: Capacity to discriminate and ease of use in clinical practice

Liesbeth A Gemert van*1,2 and Marieke J Schuurmans3

March 2007

- 87 (not delirious) older medical and surgical inpatients
- 39 Nurses completed an ‘Ease of Use’ Questionnaire
- Mean time to complete test:
  - NEECHAM 8 min; DOS 5 min (x3)
Table 4: Ease of use of the DOS Scale and the NEECHAM Confusion Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Agreement (%) DOS (N = 37)</th>
<th>Agreement (%) NEECHAM (N = 31)</th>
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<tbody>
<tr>
<td>How much time did you need to rate this scale</td>
<td>5 minutes</td>
<td>8 minutes</td>
<td>0.003</td>
</tr>
<tr>
<td>The concepts of the scale were clear to me</td>
<td>100%</td>
<td>96.7%</td>
<td>0.26</td>
</tr>
<tr>
<td>The concepts were compatible with the language used in practice</td>
<td>100%</td>
<td>83.9%</td>
<td>0.009</td>
</tr>
<tr>
<td>I have sufficient knowledge from my training/experience to evaluate the observations on the scale</td>
<td>100%</td>
<td>93.6%</td>
<td>0.135</td>
</tr>
<tr>
<td>The way in which the observations are described is free of values and judgement</td>
<td>97.3%</td>
<td>96.8%</td>
<td>0.826</td>
</tr>
<tr>
<td>The observations can be interpreted in various ways</td>
<td>24.3%</td>
<td>29.1%</td>
<td>0.440</td>
</tr>
<tr>
<td>There was a clear difference between the possible answers</td>
<td>89.2%</td>
<td>74.2%</td>
<td>0.021</td>
</tr>
<tr>
<td>I could quickly make a choice between the possible answers</td>
<td>100%</td>
<td>71%</td>
<td>0.000</td>
</tr>
<tr>
<td>The instructions on the form helped me in choosing the answers</td>
<td>74.6%</td>
<td>80.6%</td>
<td>0.542</td>
</tr>
<tr>
<td>I requested help from others because it was not clear to me what was being asked</td>
<td>2.7%</td>
<td>19.4%</td>
<td>0.010</td>
</tr>
<tr>
<td>I found it a handy instrument to spot delirium symptoms</td>
<td>91.9%</td>
<td>54.8%</td>
<td>0.000</td>
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<td>This instrument offered added value to my practice of nursing</td>
<td>83.8%</td>
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DOSS considered significantly easier to complete and more relevant to their practice
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Van Gemert & Schuurmans, 2007

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Liesbeth A Gemert van*¹,² and Marieke J Schuurmans³

Mean time to complete test: NEECHAM 8 min; DOSS 5 min
Nurses completed an ‘Ease of Use’ Questionnaire
DOSS considered significantly easier to complete and more relevant to their practice
Screening, detection and management of delirium in the emergency department – a pilot study on the feasibility of a new algorithm for use in older emergency department patients: the modified Confusion Assessment Method for the Emergency Department (mCAM-ED)

Florian F Grossmann¹, Wolfgang Hasemann², Andreas Graber³, Roland Bingisser¹, Reto W Kressig³
and Christian H Nickel¹∗

- Older ED attenders
- Trained ED nurses used MOTYB to evaluate attention, followed by mCAM-ED if +ve (informed by MSQ, Comprehension Test)

**Feasibility**
- Adherence (completion of documentation) – 65 / 85 admitted (76.5%)
- Correct use (researchers qualitatively assessed completed forms) – 6 inconclusive (8.1%)

**Problems**
- Only assessed over 1 week
- Correct use not monitored
- Poor sensitivity, not powered and ref standard not diagnostic
Recognizing acute delirium as part of your routine [RADAR]: a validation study

Philippe Voyer$^{1,2,*}$, Nathalie Champoux$^3$, Johanne Desrosiers$^4$, Philippe Landreville$^5$, Jane McCusker$^{5,7}$, Johanne Monette$^8$, Maryse Savoie$^9$, Sylvie Richard$^2$ and Pierre-Hugues Carmichael$^2$

• Instrument designed specifically to help address implementation issues
  – Time constraint (brief, integrated into routine care)
  – User confidence (training package <45 mins)
  – Patient / nurse acceptability
  – Knowledge of baseline function
  – Generalizability and validity
• 142 acute care patients & 51 LTC residents
  – 23 Delirium
• 139 nurses and nursing students (96% uptake)
  – 103 completed questionnaire
<table>
<thead>
<tr>
<th>Question</th>
<th>Time</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ...was the patient drowsy?</td>
<td>08:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Initials</td>
<td>Yes</td>
<td>No</td>
<td>Initials</td>
</tr>
<tr>
<td></td>
<td>12:00</td>
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<tr>
<td></td>
<td>HS</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. ... did the patient have trouble following your instructions?</td>
<td>08:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Initials</td>
<td>Yes</td>
<td>No</td>
<td>Initials</td>
</tr>
<tr>
<td></td>
<td>12:00</td>
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<td>17:00</td>
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</tr>
<tr>
<td></td>
<td>HS</td>
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</tr>
<tr>
<td>3. ... were the patient's movements slowed down?</td>
<td>08:00</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Initials</td>
<td>Yes</td>
<td>No</td>
<td>Initials</td>
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<tr>
<td></td>
<td>12:00</td>
<td></td>
<td></td>
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<td></td>
<td>17:00</td>
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<td>HS</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Initials</th>
<th>Name</th>
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<th>Name</th>
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</tr>
</tbody>
</table>
Voyer et al, 2015

- Mean completion time 7.2 seconds.
- % agreement 82-98% (RA / nurse)
- Test accuracy was dependent on the number of RADAR assessments (1-4) but sensitivity still only 73% in those with 3-4 assessments

**Table 9 Feasibility and acceptability of RADAR by nursing staff (N = 103)**

<table>
<thead>
<tr>
<th>Do you agree with the following statements? [Missing]</th>
<th>Agree n (%)</th>
<th>Disagree n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The RADAR items are easy to understand.</td>
<td>103 (100.0)</td>
<td></td>
</tr>
<tr>
<td>It’s easy to answer the RADAR items by observing the patient during the medication distribution process.</td>
<td>103 (100.0)</td>
<td></td>
</tr>
<tr>
<td>I have sufficient knowledge to be able to answer the RADAR items.</td>
<td>102 (99.0)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>I found the insertion of RADAR in the folder containing the medication distribution record convenient.</td>
<td>102 (99.9)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>The medication distribution process is a good time to carry out patient observation.</td>
<td>102 (99.9)</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>The knowledge provided in the RADAR training package was sufficient for me to feel competent using the tool [2].</td>
<td>99 (98.0)</td>
<td>2 (2.0)</td>
</tr>
<tr>
<td>Completing the RADAR does not result in an important increase in my workload [2].</td>
<td>100 (99.0)</td>
<td>1 (1.0)</td>
</tr>
</tbody>
</table>

- **Training:** 15 minute PowerPoint with videos  
  Practice completing RADAR
• Many great instruments
• Delirium still under-detected
• Mismatch between research and clinical application
Many great instruments
Delirium still under-detected
Mismatch between research and clinical application

Ultimately very little research on feasibility of implementation of screening
Important characteristics

- High sensitivity crucial (minimize missed cases)
- Must also be specific (reduce the potential for unnecessary further testing)
- Short
- Simple
- Require minimal training
- ‘Buy-in’
Important characteristics

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• Must also be specific (reduce the potential for unnecessary further testing)
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• Simple
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A ‘Cognitive Vital Sign’???
Attention

• Inattention mandatory for diagnosis

• Can be measured quickly at the bedside

• Which test?
Attention

- Inattention mandatory for diagnosis
- Can be measured quickly at the bedside
- Which test?

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

Zoë Tieges¹,², Laura J. E. Brown³ and Alasdair M. J. MacLullich¹,²

Published 2014
15 studies, 9 tests
Pen & paper / education / computerised device
Attention

- Inattention mandatory for diagnosis
- Can be measured quickly at the bedside
- Which test?

Promising but needs further study

Objective assessment of attention in delirium: a narrative review

Zoë Tiegës¹,², Laura J. E. Brown³ and Alasdair M. J. MacLullich¹,²

Published 2014
15 studies, 9 tests
Pen & paper / education / computerised device
Months of the Year Backwards

- Was being used clinically without evidence
- Considered to be:
  - Short
  - Simple
  - Less culturally / education biased
  - No need for pen / paper etc.

Neuropsychiatry

Attention! A good bedside test for delirium?

Niamh A O’Regan,¹ Daniel J Ryan,¹ Eve Boland,² Warren Connolly,² Ciara McGlade,¹ Maeve Leonard,³ Josie Clare,⁴ Joseph A Eustace,⁵ David Meagher,⁶,⁷ Suzanne Timmons¹
Months of the Year Backwards

MOTYB / SSF / ‘confusion’ v’s DSM-IV diagnosis
265 hospitalised patients
Screening conducted by medical residents

Table 3  Most accurate screening methods from our study, overall group and subgroups based on age and cognitive status. Our preferred screening approaches highlighted in bold

<table>
<thead>
<tr>
<th>Screening method</th>
<th>Sensitivity* (95% CI)</th>
<th>Specificity* (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General hospital inpatients (n=265)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single test</td>
<td>MOTYB</td>
<td>83.3% (69.8–92.5)</td>
</tr>
<tr>
<td>Simultaneous tests</td>
<td>MOTYB/ evidence of confusion (either positive = positive)</td>
<td>93.8% (82.8–98.6)</td>
</tr>
<tr>
<td></td>
<td>MOTYB/ SSF4 (either failed = positive)</td>
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</tr>
<tr>
<td>Older inpatients, ≥69 years (n=133)</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>MOTYB</td>
<td>83.8% (68–93.8)</td>
</tr>
<tr>
<td>Younger inpatients, ≤69 years (n=132)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single test</td>
<td>Evidence of confusion</td>
<td>90.9% (58.7–98.5)</td>
</tr>
<tr>
<td>Simultaneous tests</td>
<td>SSF4/ evidence of confusion (either positive = positive)</td>
<td>100% (73.3–100)</td>
</tr>
<tr>
<td></td>
<td>SSF4/ MOTYB (either positive = positive)</td>
<td>100% (73.3–100)</td>
</tr>
<tr>
<td>Patients with known dementia (n=31)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single test</td>
<td>MOTYB</td>
<td>87.5% (67.6–97.2)</td>
</tr>
<tr>
<td>Patients with no history of dementia (n=154)</td>
<td>Simultaneous tests</td>
<td>MOTYB/ SSF4 (either positive = positive)</td>
</tr>
</tbody>
</table>

*Sensitivities and specificities with 95% CIs based only on results from our study.
MOTYB, months of the year backwards test; ssf4, spatial span forwards with a cut-off of 4.
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<td>87.5% (80.2–92.8)</td>
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<td><strong>Sensitivity</strong></td>
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<tr>
<td><strong>Specificity</strong></td>
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General hospital inpatients: Sensitivity 83.3%, Specificity 90.8%

Older inpatients: Sensitivity 83.8%, Specificity 89.6%

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<tr>
<td>O’Regan et al, 2014</td>
<td>83.3</td>
<td>90.8</td>
</tr>
<tr>
<td>Fick et al, 2015</td>
<td>83</td>
<td>89</td>
</tr>
<tr>
<td>Adamis et al, 2016</td>
<td>82</td>
<td>86</td>
</tr>
<tr>
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<td>91.3</td>
<td>49.7</td>
</tr>
<tr>
<td>O’Regan et al, 2016</td>
<td>84.6</td>
<td>58.4</td>
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<table>
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<tr>
<th>4AT</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lees et al, 2013</td>
<td>100</td>
<td>82</td>
</tr>
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<td>80</td>
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*Brady et al, submitted*
Implementation?

• Very little evidence to date
• Refusal rates low in one of our cross-sectional studies (?higher with repeated testing)
• Time <1 min?
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Table 3  Rates of refusal for each test by cognitive subgroup (delirium, dementia without delirium, no neurocognitive disorder) in this cross-sectional study of prevalent delirium

<table>
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<tr>
<th>Test</th>
<th>Whole group n = 470</th>
<th>No delirium or dementia n = 204</th>
<th>Dementia only n = 36</th>
<th>All delirium n = 184</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-CIT (n, %)</td>
<td>49 (10.4)</td>
<td>17 (8.3)</td>
<td>4 (11.1)</td>
<td>26 (14.1)</td>
</tr>
<tr>
<td>SSF (n, %)</td>
<td>41 (8.7)</td>
<td>8 (3.9)</td>
<td>0 (0)</td>
<td>31 (16.8)</td>
</tr>
<tr>
<td>CDT (n, %)</td>
<td>111 (23.6)</td>
<td>27 (13.2)</td>
<td>5 (13.9)</td>
<td>74 (40.2)</td>
</tr>
<tr>
<td>MOTYB (n, %)</td>
<td>30 (6.4)</td>
<td>2 (1.0)</td>
<td>0 (0)</td>
<td>28 (15.2)</td>
</tr>
<tr>
<td>IPT (n, %)</td>
<td>82 (17.4)</td>
<td>18 (8.8)</td>
<td>2 (5.6)</td>
<td>60 (32.6)</td>
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As part of another test...

- Ultra-brief and 3D-CAM (under study)
  - Step 1:
    - What day is it?
    - MOTYB
  - Step 2:
    - Operationalised version of the CAM

Studies of feasibility ongoing at Harvard and Penn State
As part of another test...

- **4AT – The 4 A’s Test**

[4AT Test Form Image]

### 4AT Test Form

**Patient name:**

**Date of birth:**

**Patient number:**

**Assessment test for delirium & cognitive impairment**

**Date:**

**Time:**

**Tester:**

#### 1. Alertness
This includes patients who may be markedly drowsy (e.g., difficult to arouse and/or obviously sleepy during assessment) or agitated/irritable. Observe the patient. If asleep, attempt to wake with speech or gently touch on shoulder. Ask the patient to state their name and address to assist rating.

- Normal (fully alert, but not agitated, throughout assessment) 0
- Mild sleepiness for <15 seconds after waking, then normal 0
- Severe abnormal 4

**Test:**

- No mistakes 0
- 1 mistake 1
- 2 or more mistakes/insufficient 2

#### 3. Attention
Ask the patient: “Please tell me the months of the year in backwards order, starting at December.” To assess initial understanding, one prompt of “What is the month before December?” is permitted.

- Months of the year backwards
  - Achieves 7 months or more correctly 0
  - Starts but scores <7 months / refuses to start 1
  - Unfinished (cannot start because asleep, drowsy, indifferent) 2

#### 4. Acute Change or Fluctuating Course
Evidence of significant change or fluctuation in: alertness, cognition, other mental function (e.g., delirium, hallucinations) existing over the last 2 weeks and still evident in last 24hrs

- No 0
- Yes 4

**4AT Score**
4AT

Assessment test for delirium & cognitive impairment

Date: ____________________________
Time: ____________________________
Tester: ____________________________

[4] ACUTE CHANGE OR FLUCTUATING COURSE
Evidence of significant change or fluctuation in: alertness, cognition, other mental function (e.g. paranoia, hallucinations) arising over the last 2 weeks and still evident in last 24hrs

No
Yes

4 or above: possible delirium +/- cognitive impairment
1-3: possible cognitive impairment
0: delirium or severe cognitive impairment unlikely (but delirium still possible if [4] information incomplete)

4AT SCORE: [ ]
As part of another test...

- 4AT – The 4 A’s Test

Not really a step 1 test
As part of another test...

Ongoing studies looking at

- Step 1: RADAR
- Step 2: 4-AT
In London...

Ongoing study of a ‘Cognitive Vital Sign’ for Detection of Delirium in Older Medical Inpatients

Feasibility on an Acute Care of the Elderly Unit for daily use by nursing staff

- RADAR
- MOTYB
Measuring Feasibility

- Inter-rater reliability
- Sensitivity / Specificity / NPV / PPV
- Test duration
- Withdrawal and refusal rates
- Rate of completion of each element
- Extent of missing / unusable data
- Acceptability to patients and caregivers
- Acceptability to nursing staff
Food for thought…

• What should we ask
  – Patients
  – Caregivers
  – Nursing Staff?

• What else should we measure?
DON’T FORGET!!

#WDAD2018

I am Delirium Aware

14 March 2018

#deliriumeh,
#WDAD2018

@iDelirium_Aware
Questions and Discussion......
Thank you for attending this webinar!

You will receive a quick evaluation survey by email – please share your suggestions and topics for future sessions. A link to presentation slides and a recording will be provided.

Details and registration information for our next webinar presentations will be emailed to you – please continue to join us and contribute to this shared learning!

If you have additional questions, contact ken.wong@sunnybrook.ca