As if dementia reviews weren’t complex enough......

Cochrane Dementia Group’s adventures with NIHR Complex Reviews Support Unit (NIHR CRSU)

Department of Health Disclaimer:
The views and opinions expressed herein are those of the authors and do not necessarily reflect those of NIHR, NHS or the Department of Health
Cochrane Dementia & Cognitive Improvement

• Why add more complexity

• NMA

• DTA

• Overviews

• Prognosis

• The good, the bad and the complex
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• Dementia is a public health priority

• Limited evidence based therapy

• Established Cochrane Group,
• Diverse portfolio,
• Program grants
• Social media profile
• etc
• etc
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- “.....group has a narrow focus.........”
- “...simple reviews...”
- “....niche topics.....”
- “.....need for prioritisation........”
- “.....limited evidence of impact.....”
No conclusions can be made..........

Further high quality trials are needed.........
Cochrane Dementia & Cognitive Improvement

• What are our most important reviews?
• What are the strengths of the group?
• What do stakeholders want?
• Which new areas can we start to develop?
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Cochrane Dementia & Cognitive Improvement

• What are our most important reviews?

• What are the strengths of the group?

• What do stakeholders want?

• Which new areas can we start to develop?
Dear Cochrane CRSU

I wonder if you could help with one of our reviews.

We are updating our reviews of acetylcholinesterase inhibitors in vascular dementia. We think it would be good to compare the three available drugs using a network approach. We don't have much experience of NMA, so any help greatly appreciated.

Let me know if you need more information from my end, happy to chat on 'phone.

Best wishes

Terry
On behalf of Cochrane Dementia Group
Cochrane Dementia & Cognitive Improvement

Cholinesterase inhibitors for vascular dementia and other vascular cognitive impairments: a network meta-analysis

More informative review
Authors needed support with app
Issues with incorporating NMA into review template
There is STRONG evidence supporting multi-component interventions to prevent delirium in hospitalised patients.
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1. Sleep protocol, avoid sedatives, reorientation, early mobilisation
2. Avoid sedatives, reorientation, avoid catheters
3. Sleep protocol, environmental factors, nurse training, screening
4. Screening, reorientation, early mobilisation
5. Avoid sedatives, nurse training, screening
6. Sleep protocol, nurse training, early mobilisation
7. Early mobilisation, nurse training, screening
8. Early mobilisation, avoid sedatives, avoid urinary catheters
9. Environmental factors, nurse training, screening, avoid sedatives, avoid catheters
10. Nurse training, sleep protocol, early mobilisation
## Cochrane Dementia & Cognitive Improvement

<table>
<thead>
<tr>
<th>Any multicomponent intervention</th>
<th>Usual care</th>
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</thead>
</table>

Cochrane Dementia & Cognitive Improvement

- Sleep protocol, avoid sedatives, reorientation, early mobilisation, avoid catheters, environmental factors, nurse training, screening,

Usual care
Dear Cochrane CRSU

I wonder if you could help with one of our reviews.

We are updating our review of non-drug interventions for delirium prevention. The interventions are often multi-component and we wondered if there may be scope to assess the relative contribution of the various components. We don’t have much experience in this area, so any help greatly appreciated.

Let me know if you need more information from my end, happy to chat on 'phone.

Best wishes

Terry
On behalf of Cochrane Dementia Group
• More complex analysis offers a more useful result

• Good to liaise with NIHR CRSU early

• Approach to analysis needs to be flexible depending on the data
Can we create a network to compare individual drug classes?

No.
Can we create a network to compare individual drug classes?

No.
But, here are some other things you could do.........
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Cochrane Dementia & Cognitive Improvement

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• What are the strengths of the group?

• What do stakeholders want?

• Which new areas can we start to develop?
## Cochrane Dementia & Cognitive Improvement

<table>
<thead>
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<th>Review Title</th>
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<tr>
<td>CD005563</td>
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<td>CD001120</td>
<td>Reminiscence therapy for dementia</td>
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<td><strong>Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaulated people aged 65 and over in community and primary care populations</strong></td>
<td>6,179</td>
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Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations

Mini-Cog for the diagnosis of Alzheimer's disease dementia and other dementias within a community setting

Montreal Cognitive Assessment for the diagnosis of Alzheimer's disease and other dementias
Cochrane Dementia & Cognitive Improvement

The fraction of diseased patients correctly diagnosed by a test is often referred to as test sensitivity and the fraction of healthy patients correctly diagnosed by a test as specificity. These quantities are used to describe the performance of a diagnostic test, and both will vary with the test threshold used.

If 1 - specificity is plotted against sensitivity for all threshold values, a Receiver Operating Characteristic (ROC) plot is created (above right figure). This summarises test performance across all thresholds giving the possible trade-offs that can be achieved between False Negatives and False Positives (plotted above).

Explore how changing the means and variances of the test distributions in the diseased and healthy affect the ROC curve.

Performance of a test relating to specified distribution and threshold values:

Selected threshold above which test diagnoses patients as diseased is 20.

At this test threshold 74.8% of diseased patients are correctly diagnosed by the test (sensitivity), and 26.2% are incorrectly diagnosed as healthy.

84.1% of healthy patients are correctly diagnosed by the test (specificity), and 15.9% are incorrectly diagnosed as diseased.
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A problem was encountered while renewing:
Apply SAS Foundation license file for renewal
For more information please see the log file:
C:\Program Files\SASHome\SASFoundation\9.4\setinit.log
Would you like to retry this installation?

No  Retry
Meta-Analysis of Diagnostic Test Accuracy Studies

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<th>Year</th>
<th>TP</th>
<th>FN</th>
<th>FP</th>
<th>TN</th>
<th>N</th>
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<th>Specificity</th>
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<td>47</td>
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<td>211</td>
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<td>0.672</td>
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<td>84</td>
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<td>Gordon</td>
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<td>752</td>
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<td>3226</td>
<td>2977</td>
<td>6955</td>
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<td>0.480</td>
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<tr>
<td>Gual</td>
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<td>59</td>
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<td>55</td>
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<td>255</td>
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<td>Rumpf</td>
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<td>0.740</td>
<td>0.850</td>
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<tr>
<td>Seake</td>
<td>2006</td>
<td>137</td>
<td>24</td>
<td>107</td>
<td>358</td>
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<td>0.651</td>
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<td>600</td>
<td>0.809</td>
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<td>Tuunanen</td>
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<td>152</td>
<td>51</td>
<td>88</td>
<td>254</td>
<td>545</td>
<td>0.740</td>
<td>0.743</td>
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</tbody>
</table>

Note: Arrows to the right of the column headings can be used to sort data into ascending or descending order.
Q. What is the accuracy of MMSE for diagnosis of dementia?

Q. Which test should I use to screen for dementia in my patients?
Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaled people aged 65 and over in community and primary care populations

Mini-Cog for the diagnosis of Alzheimer's disease dementia and other dementias within a community setting

Montreal Cognitive Assessment for the diagnosis of Alzheimer’s disease and other dementias
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Mini-Mental State Examination

Montreal Cognitive Assessment

Mini-Cog Screening Tool

Clinical diagnosis of dementia
Cochrane Dementia & Cognitive Improvement

Mini-Mental State Examination

Clinical diagnosis of dementia

Mini-Cog Screening Tool

Montreal Cognitive Assessment
Network meta-analysis of diagnostic test accuracy studies identifies and ranks the optimal diagnostic tests and thresholds for healthcare policy and decision-making

Rhiannon K. Owen\textsuperscript{a, b}, Nicola J. Cooper\textsuperscript{a}, Terence J. Quinn\textsuperscript{b}, Rosalind Lees\textsuperscript{b}, Alex J. Sutton\textsuperscript{a}

\textsuperscript{a}Department of Health Sciences, University of Leicester, Leicester, UK
\textsuperscript{b}Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK

Accepted 7 March 2018; Published online 13 March 2018

Table 4. Estimated mean difference (95% Crl) in sensitivity (top right) and specificity (bottom left) between each test-threshold combination (row — column) obtained from a model incorporating threshold constraints and assuming a common heterogeneity and correlation parameter across tests

<table>
<thead>
<tr>
<th>Test-threshold</th>
<th>MMSE &lt; 25</th>
<th>MMSE &lt; 27</th>
<th>MoCA &lt; 22</th>
<th>MoCA &lt; 26</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMSE &lt; 25</td>
<td>-</td>
<td>0.17 (0.08, 0.26)</td>
<td>0.10 (−0.01, 0.22)</td>
<td>0.25 (0.15, 0.35)</td>
</tr>
<tr>
<td>MMSE &lt; 27</td>
<td>0.26 (0.15, 0.39)</td>
<td>-</td>
<td>−0.07 (−0.18, 0.03)</td>
<td>0.08 (0.02, 0.16)</td>
</tr>
<tr>
<td>MoCA &lt; 22</td>
<td>0.07 (−0.01, 0.18)</td>
<td>−0.19 (−0.33, −0.06)</td>
<td>-</td>
<td>0.14 (0.07, 0.25)</td>
</tr>
<tr>
<td>MoCA &lt; 26</td>
<td>0.49 (0.38, 0.61)</td>
<td>0.23 (0.08, 0.37)</td>
<td>0.42 (0.31, 0.52)</td>
<td>-</td>
</tr>
</tbody>
</table>

Above the leading diagonal gives estimates of the mean difference (row — column) in sensitivity (95% Crl), and below the leading diagonal gives estimates of the mean difference in specificity (95% Crl).

Fig. 1. Network of comparative studies. MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment.
‘User friendly interface very helpful for authors

Still requires a knowledge of DTA theory to interpret the results

Potential for even more complexity, but this is needed to give clinically useful results
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- Increasing number of SRs looking at accuracy of single dementia tests

- Methodology for indirect comparisons of accuracy across reviews

- An overview of DTA could:
  - Collate the available literature
  - Assess the quality of evidence
  - Compare accuracy of various tests
  - Create an ‘evidence map’
    highlighting where new reviews or new research studies are needed
Dear Cochrane CRSU

I wonder if you could help with a new review.

We have published a number of DTA reviews looking at dementia diagnosis. We now want to collate all the reviews in an overview. We are especially keen to use the overview to allow comparisons of the accuracy of various tests.

We don’t have much experience in this area, so any help greatly appreciated.

Let me know if you need more information from my end, happy to chat on ’phone.

Best wishes

Terry
On behalf of Cochrane Dementia Group
Cochrane Dementia & Cognitive Improvement

Informant based screening tools for diagnosis of dementia, an overview of test accuracy studies

Protocol information

Review type: Overview
Authors
Sara Nafsi1, Martin Taylor-Rowan2, Amit Patel3, Terry J Quinn4
1Cardiovascular and Medical Sciences, University of Glasgow, Glasgow
2Cardiovascular Science, University of Glasgow, Glasgow, UK
3Other
4Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK

Citation example: Nafsi S, Taylor-Rowan M, Patel A, Quinn T. Informant based screening tools for diagnosis of dementia, an overview of test accuracy studies. Cochrane Database of Systematic Reviews, Issue 7, Art. No...DOI.

Contact person
Terry J Quinn

- Useful peer review
- Learned a lot about overview strengths, limitations and methodological challenges
- Liaise with Cochrane before doing anything too novel
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• What are our most important reviews?

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• Which new areas can we start to develop?
Cochrane Dementia & Cognitive Improvement

• What are our most important reviews?
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• What do stake holders want?
• Which new areas can we start to develop?
Prioritising our stroke and VCI reviews

The Cochrane Dementia and Cognitive Improvement Group publish systematic reviews, meta-analyses and methodological guidance. Our remit extends beyond dementia and we are keen to develop our portfolio in the areas of vascular cognitive impairment and post-stroke problems. We hope you can help us select review titles that tackle questions of greatest relevance to the stroke and VCI community.

To help us in our prioritisation work we would be grateful if you complete the three questions below and overleaf. Hopefully this should only take a few minutes and it will be incredibly helpful for our group.

If you have other ideas or thoughts that you want to share, please get in touch. There is space for free text comments and email contact details at the end of the questionnaire.
Cochrane Dementia & Cognitive Improvement

2. Traditionally Cochrane has focused on clinical trials, but we now have methods that allow us to collate evidence from other types of research. For the table below, please rank (1-5) order of importance (1=most; 5=least important) *

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Clinical trials of treatment interventions</td>
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<td></td>
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<td></td>
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<tr>
<td>Clinical trials of preventative interventions</td>
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<tr>
<td>Studies of assessments/tests (test accuracy research)</td>
<td></td>
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<tr>
<td>Studies of opinions, experiences (qualitative research)</td>
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<tr>
<td>Studies of factors that predict outcomes (prognostic research)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
18F PET with florbetaben for the early diagnosis of Alzheimer's disease dementia and other dementias in people with mild cognitive impairment (MCI)

Cochrane Systematic Review - Diagnostic | Version published: 22 November 2017
https://doi.org/10.1002/14651858.CD012883

CSF tau and the CSF tau/ABeta ratio for the diagnosis of Alzheimer's disease dementia and other dementias in people with mild cognitive impairment (MCI)

Cochrane Systematic Review - Diagnostic | Version published: 22 March 2017
https://doi.org/10.1002/14651858.CD010803.pub2
Dear Cochrane CRSU

I wonder if you could help with a new review.

We want to develop a prognosis review.
Title: anticholinergic burden for prediction of dementia/cognitive decline.
We have input from Prognosis Methods group, but would be especially grateful for help with the meta-analysis aspect of the review.
We don’t have much experience in this area, so any help greatly appreciated.

Let me know if you need more information from my end, happy to chat on ’phone.

Best wishes

Terry
On behalf of Cochrane Dementia Group
If you thought DTA was complex…….

New territory for NIHR CRSU

Working in partnership with Prognosis Methods

Watch this space
Cochrane Dementia & Cognitive Improvement

- Why add more complexity
- NMA
- DTA
- Overviews
- Prognosis
- The good, the bad and the complex