



# 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



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



- Dementia is a public health priority
- Limited evidence based therapy
- Established Cochrane Group,
- Diverse portfolio,
- Program grants
- Social media profile
- etc
- etc





• ".....group has a narrow focus......"

### SUPPORTED BY

### **NHR** National Institute for Health Research

- "...simple reviews..."
- "....niche topics....."
- ".....need for prioritisation......"
- ".....limited evidence of impact....."





No conclusions can be made.....

Further high quality trials are needed.....



- What are our most important reviews ?
- What are the strengths of the group ?
- What do stake holders want ?
- Which new areas can we start to develop ?



**Cognitive Improvement** 

### **Cochrane Dementia & Cognitive Improvement**

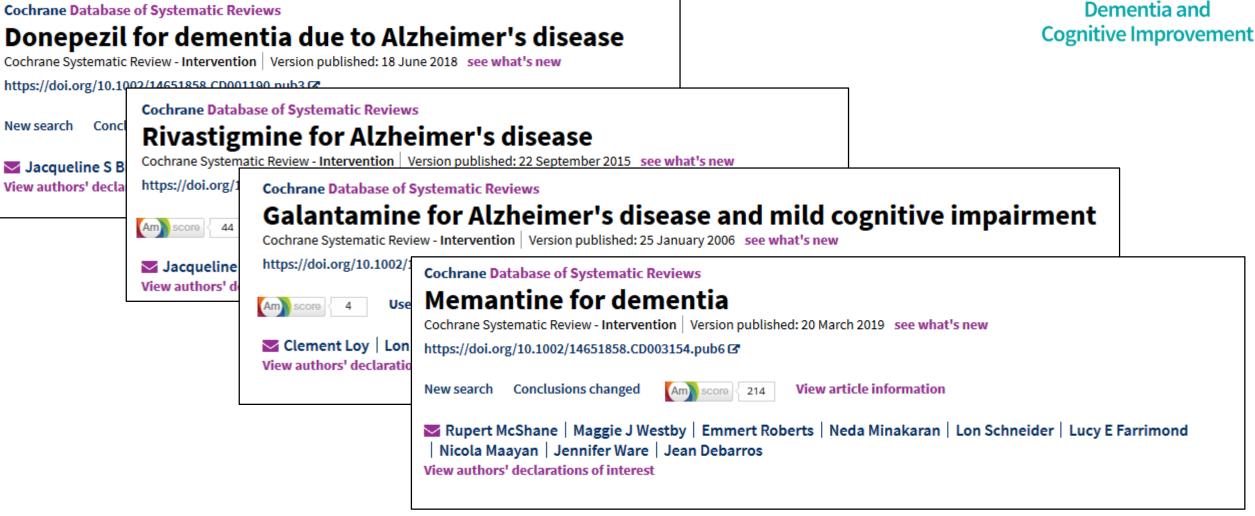
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View Tools Favourites Help					
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Cochrane		<b>N</b>			
	Active   189				
	11C-PIB-PET for the early diagnosis of Alzheimer's diagnosis	Zhang, Shuo	DTA 17	• •	
My Reviews	18F PET with florbetaben for the early diagnosis of Al:			•	Authoring
Derivative Products	18F PET with florbetapir for the early diagnosis of Alzl	10-14 C		•	Authoring
Co-ordinating Editors' Board	18F PET with flutemetamol for the early diagnosis of A	- PA		•	Authoring
Dementia and Cognitive Improvement Group	18F-FDG PET for the early diagnosis of Alzheimer's d	100 C		• •	
E People	Acetyl-I-carnitine for dementia	Hudson, Sheila	a A 133	• •	
	Acupuncture for vascular dementia	Peng, Weina		•	Authoring
	AD-8 for detection of dementia across a variety of hea	- M	_	•	Authoring
Eul Reviews	Addenbrooke's Cognitive Examination III (ACE-III) and	p-3.		• •	
Protocols	Aerobic exercise to improve cognitive function in older	100	128	•	· · · · · · · · · · · · · · · · · · ·
🗄 🗠 Topics List	Algorithm-based pain management for people with de	100		•	
🕀 🗠 Files	Almitrine-Raubasine combination for dementia	Yang, Weimin			) Authoring
Workflows	Alpha lipoic acid for dementia	Klugman, Anth	ony 139	•	Authoring
Effective Practice and Organisation of Care Group	Animal-assisted therapy for dementia	📩 Lai, Nai Ming		•	
	Antidepressants for agitation and psychosis in demen	10%		• •	Authoring
Prognosis Methods Group	Antidepressants for treating depression in dementia	Dudas, Robert	24	•	
Stroke Group	Antihypertensive withdrawal for the prevention of cogr	- M		•	
	Antipsychotics for agitation and psychosis in people w	p=3,	1	•	
	Antipsychotics for treatment of delirium in hospitalised	14	<b></b>		Authoring
	Antithrombotic therapy to prevent cognitive decline in	Kwan, Joseph		•	
	Aromatherapy for dementia	Owen-Booth, E			) Authoring
	Art therapy for people with dementia	Deshmukh, Su			Authoring
	Aspirin and other non-steroidal anti-inflammatory drug	100 C			) Authoring
	Aspirin for vascular dementia	Rands, Gianet		-	Authoring
	Aspirin, steroidal and non-steroidal anti-inflammatory			-	Authoring
	Assistive technology for memory support in dementia	Van der Roest		-	Authoring
	Atypical antipsychotics for agitation and psychosis in A	10-1, C		•	
	Benzodiazepines for delirium	Shang, Hong C	al o		
	Benzodiazepines for treatment of delirium in non-ICU     Cannabinoids for the treatment of Alzhemer's dement	📩 Li, Yan	da 115		
		- M	da 115		
	Cannabinoids for the treatment of dementia	Puljak, Livia	447		
	Carbohydrates for improving the cognitive performance	- PA	-		Authoring
		He, Li			
		Birks, Jacqueli		•	Authoring
		Overshott, Ros		-	) Editorial
		10-1.	5 102	- <b>-</b>	Authoring
		100	ial		_
		14			Authoring
		100 C		- <b>-</b> `	Editorial
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		P-1			Authoring Authoring
		Woods, Bob	Son not		_
		24	May 118		) Editorial
	Cognitive training and cognitive rehabilitation for older	10-1.	-icx 110	(	Euronai



- What are our most important reviews ?
- What are the strengths of the group ?
- What do stake holders want ?
- Which new areas can we start to develop ?







**Dementia and** 

	Dementia and
To Moira Sim;	Cognitive Improvement
Send Cc	8
Subject: re: help with a Cochrane review	
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	
A Moira Sim	



**Cochrane Database of Systematic Reviews** 

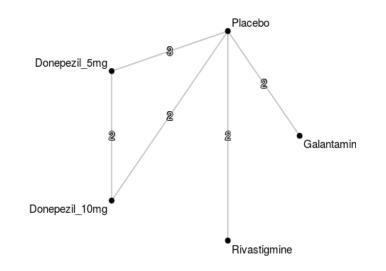
# Cholinesterase inhibitors for vascular dementia and other vascular cognitive impairments: a network meta-analysis

Cochrane Systematic Review - Intervention - Protocol Version published: 10 April 2019

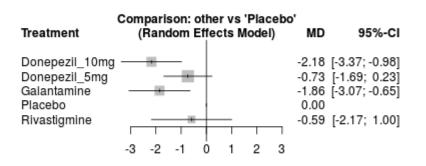
https://doi.org/10.1002/14651858.CD013306 🗗

N score 4 View article information

Ceri E Battle | Azmil H Abdul-Rahim | Susan D Shenkin | Jonathan Hewitt View authors' declarations of interest



- More informative review
- Authors needed support with app
- Issues with incorporating NMA into review template





CD Number	Review Title	Full text downloads
CD005563	Interventions for preventing delirium in hospitalised non-ICU patients	7,741
CD001120	Reminiscence therapy for dementia	6,711
CD011145	Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations	6,179

"There is STRONG evidence supporting multi-component interventions to prevent delirium in hospitalised patients"



- 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 raining, screening, avoid sedatives, avoid catheters
- 10. Nurse training, sleep protocol, early mobilisation



Dementia and Cognitive Improvement

### Cochrane Dementia & Cognitive Improvement

Any multicomponent intervention

Usual care



Dementia and Cognitive Improvement

### **Cochrane Dementia & Cognitive Improvement**

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



				Dementia anu
	То	Moira Sim;		Cognitive Improvement
Send	Cc			-
Send	Subject:	re: help with a Cochrane review		
Dear	Cochrar	ne CRSU		
l wor	nder if yo	ou could help with one of our reviews.		
The in relati	ntervent ve contr	ting our review of non-drug interventions for delirium prevention tions are often multi-component and we wondered if there may be scope to assess the ribution of the various components. ve much experience in this area, so any help greatly appreciated.		
Let m	ne know	if you need more information from my end, happy to chat on 'phone.		
Best	wishes			
Terry On be		Cochrane Dementia Group		
2	Moira Sim		2 ^	

### **Cochrane Dementia & Cognitive Improvement**

Cochrane Database of Systematic Reviews

# Non-pharmacological interventions for preventing delirium in hospitalised non-ICU patients

Cochrane Systematic Review - Intervention - Protocol Version published: 15 April 2019

https://doi.org/10.1002/14651858.CD013307 🗗

Am score

View article information

Jennifer K Burton | Najma Siddiqi | Elizabeth A Teale | Amanda Barugh | Alex J Sutton View authors' declarations of interest

- 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



**Cochrane Database of Systematic Reviews** 

### Blood pressure lowering in patients without prior cerebrovascular disease for prevention of cognitive impairment and dementia

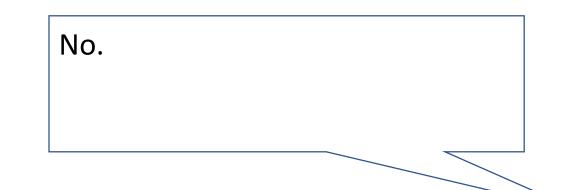
Cochrane Systematic Review - Intervention Version published: 07 October 2009 see what's new

https://doi.org/10.1002/14651858.CD004034.pub3 🗗

New search Conclusions changed Am score 18 Used in 1 guideline View article information

Bernadette McGuinness | Stephen Todd | Peter Passmore | Roger Bullock View authors' declarations of interest

Can we create a network to compare individual drug classes ?





**Cochrane Database of Systematic Reviews** 

# Blood pressure lowering in patients without prior cerebrovascular disease for prevention of cognitive impairment and dementia

Cochrane Systematic Review - Intervention Version published: 07 October 2009 see what's new

https://doi.org/10.1002/14651858.CD004034.pub3 🗗

New search Conclusions changed Am score 18 Used in 1 guideline View article information

Bernadette McGuinness | Stephen Todd | Peter Passmore | Roger Bullock View authors' declarations of interest

Can we create a network to compare individual drug classes ?

No.

But, here are some other things you could do.....



- What are our most important reviews ?
- What are the strengths of the group ?
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- Which new areas can we start to develop ?



- What are our most important reviews ?
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- Which new areas can we start to develop?



CD Number	Review Title	Full text downloads
CD005563	Interventions for preventing delirium in hospitalised non-ICU patients	7,741
CD001120	Reminiscence therapy for dementia	6,711
CD011145	Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations	6,179



**Cognitive Improvement** 

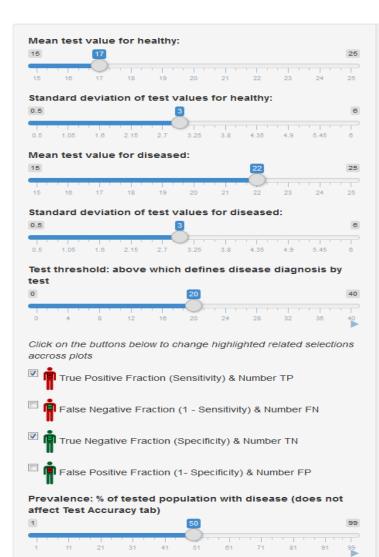
### **Cochrane Dementia & Cognitive Improvement**

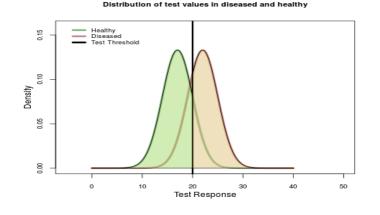
**Cochrane Database of Systematic Reviews** 

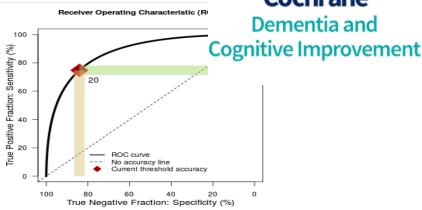
Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations

Cochrane Systematic Review - Diagnostic Version published: 13 January 2016 see what's new









### Hide/show explanation text

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.

	D	True S iseased	Status H	ealthy
+ Test	İ	Sensitivity 74.8 %	İ	15.9 %
-	İ	25.2 %	İ	Specificity 84.1 %

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 **25.2%** 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.









### Meta-Analysis of Diagnostic Test Accuracy Studies

Options for ROC Curve tab

Display 95% study level confidence intervals

Extrapolate SROC curve
 Bivariate model options
 Summary point
 95% Confidence region
 95% Predictive region

Options for Statistics tab

Data PointsSROC curve

Sensitivity
 Specificity

SensitivitySpecificity

False Positive Rate
 Correlation
 HSROC parameters
 Diagnostic Odds Ratio
 Likelihood Ratios

	Idy-level Outcomes	ROC Curve	Statistics		t data into a			for RevMan ding order.		
Show	a 30 - entries								Search:	
	Author	🔶 Year 🔶	TP 🔶	FN	FP	TN 🔶	<b>N</b> \$	Sensitivity	Specificity	/ 🔶 FPR
1	Aalto	2006	47	9	101	738	895	0.839	0.880	0.120
2	Aertgeerts01	2001	126	51	272	1543	1992	0.712	0.850	0.150
3	Aertgeerts02	2002	19	10	12	192	233	0.655	0.941	0.059
4	Bradley03	2003	36	3	78	276	393	0.923	0.780	0.220
5	Bradley07	2007	130	19	211	959	1319	0.872	0.820	0.180
6	Bush	1998	84	2	68	89	243	0.977	0.567	0.433
7	Gomez	2006	68	0	112	423	603	1.000	0.791	0.209
8	Gordon	2001	752	0	3226	2977	6955	1.000	0.480	0.520
9	Gual	2002	59	5	55	136	255	0.922	0.712	0.288
10	Rumpf	2002	142	50	571	2788	3551	0.740	0.830	0.170
11	Seale	2006	137	24	107	358	626	0.851	0.770	0.230
12	Selin	2006	57	3	103	437	600	0.950	0.809	0.191
13	Tsai	2005	34	1	21	56	112	0.971	0.727	0.273
14	Tuunanen	2007	152	51	88	254	545	0.749	0.743	0.257

### Showing 1 to 14 of 14 entries

Next



**Cognitive Improvement** 

### **Cochrane Dementia & Cognitive Improvement**

**Cochrane Database of Systematic Reviews** 

### Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations

Cochrane Systematic Review - Diagnostic Version published: 13 January 2016 see what's new

https://doi.org/10.1002/14651858.CD011145.pub2 🗗



50 Used in 2 guidelines View article information

Sam T Creavin | Susanna Wisniewski | Anna H Noel-Storr | Clare M Trevelyan | Thomas Hampton | Dane Rayment | Victoria M Thom | Kirsty J E Nash | Hosam Elhamoui | Rowena Milligan | Anish S Patel | Demitra V Tsivos | Tracey Wing | Emma Phillips | Sophie M Kellman | Hannah L Shackleton | Georgina F Singleton | Bethany E Neale | Martha E Watton | Sarah Cullum View authors' declarations of interest

Q. What is the accuracy of MMSE for diagnosis of dementia?

Q. Which test should I use to screen for dementia in my patients ?



**Cognitive Improvement** 

### **Cochrane Dementia & Cognitive Improvement**

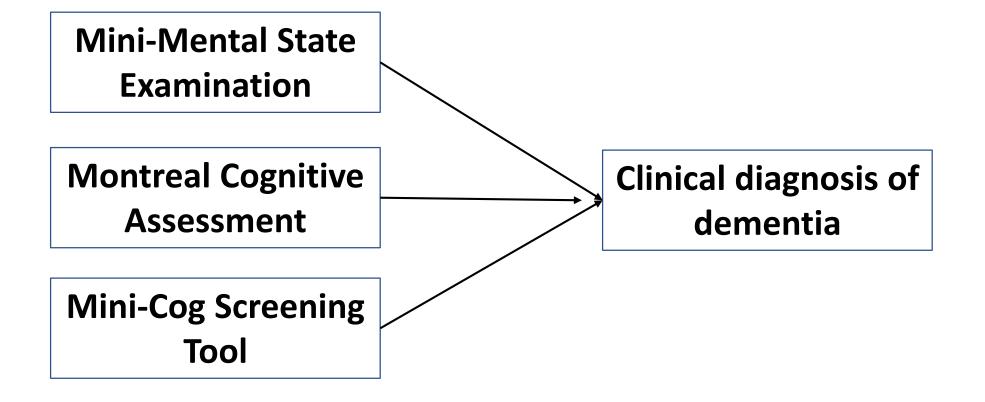
**Cochrane Database of Systematic Reviews** 

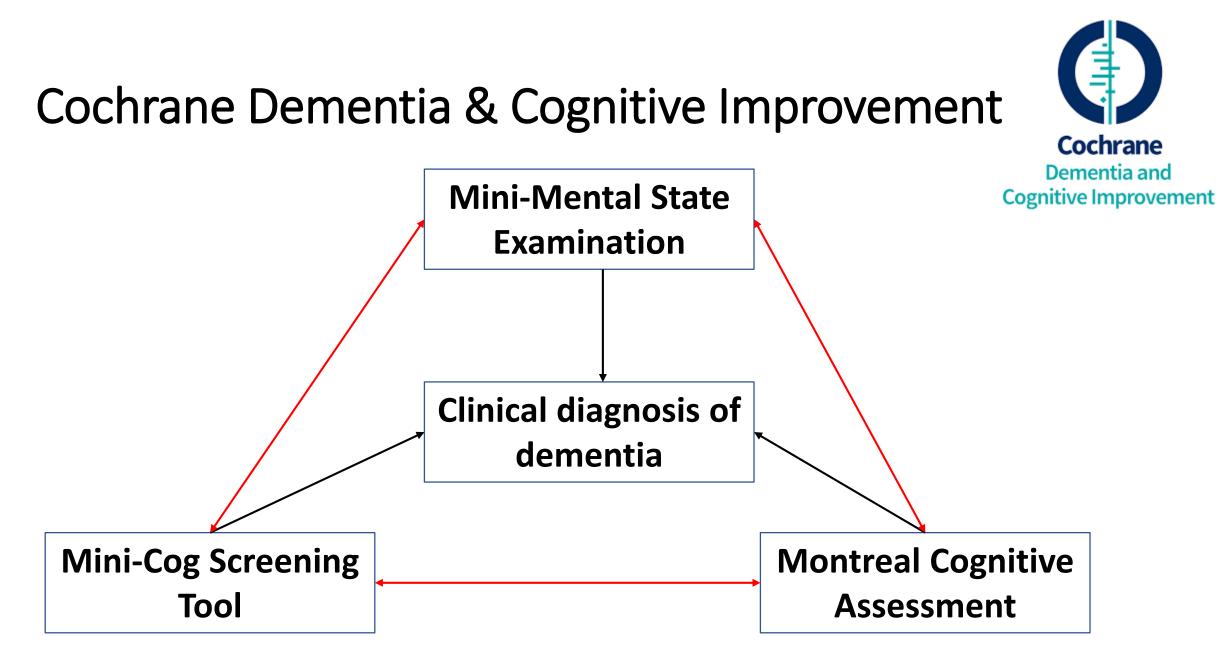
Mini-Mental State Examination (MMSE) for the detection of dementia in clinically unevaluated people aged 65 and over in community and primary care populations

Cochrane Systematic Review - Diagnostic Version published: 13 January 2016 see what's new













Dementia and Cognitive Improvement



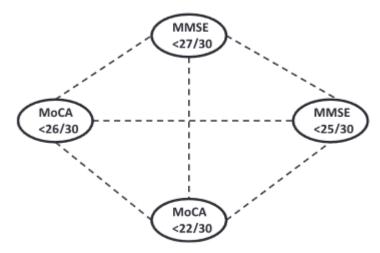
Journal of Clinical Epidemiology 99 (2018) 64-74

ORIGINAL ARTICLE

### Network meta-analysis of diagnostic test accuracy studies identifies and ranks the optimal diagnostic tests and thresholds for health care policy and decision-making

Rhiannon K. Owen<sup>a,\*</sup>, Nicola J. Cooper<sup>a</sup>, Terence J. Quinn<sup>b</sup>, Rosalind Lees<sup>b</sup>, Alex J. Sutton<sup>a</sup>

<sup>a</sup>Department of Health Sciences, University of Leicester, Leicester, UK <sup>b</sup>Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK Accepted 7 March 2018; Published online 13 March 2018



Check for updates

**Table 4.** Estimated mean difference (95% CrI) 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

Journal of

Clinical

Epidemiology

Test-threshold	MMSE <25	MMSE <27	MoCA <22	MoCA <26
MMSE <25	-	0.17 (0.08, 0.26)	0.10 (-0.01, 0.22)	0.25 (0.15, 0.35)
MMSE <27	0.26 (0.15, 0.39)	-	-0.07 (-0.18, 0.03)	0.08 (0.02, 0.16)
MoCA <22	0.07 (-0.01, 0.18)	-0.19 (-0.33, -0.06)	-	0.14 (0.07, 0.25)
MoCA <26	0.49 (0.38, 0.61)	0.23 (0.08, 0.37)	0.42 (0.31, 0.52)	-

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

Fig. 1. Network of comparative studies. MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment.



Mini-Cog for the diagnosis of Alzheimer's disease dementia and other **Cognitive Improvement** dementias within a community setting Cochrane Systematic Review - Diagnostic Version p **Cochrane Database of Systematic Reviews** https://doi.org/10.1002/14651858.CD010860.pub2 @ Addenbrooke's Cognitive Examination III (ACE-III) and mini-ACE for the detection of dementia and mild cognitive impairment Used in 1 guideline View art Am score 10 Cochrane Systematic Review - Diagnostic - Protocol Version published: 05 March 2019 Bruce A Fage | Calvin CH Chan | Sudeep S Gil https://doi.org/10.1002/14651858.CD013282 G Dallas P Seitz View authors' declarations of interest View article information (Am) score Lucy C Beishon Angus P Batterham Terry J Quinn Christopher P Nelson Ronney B Panerai Thompson Robinson Victoria J Haunton

View authors' declarations of interest

• 'User friendly interface very helpful for authors

**Cochrane Database of Systematic Reviews** 

- 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

- 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





Dementia and Cognitive Improvement

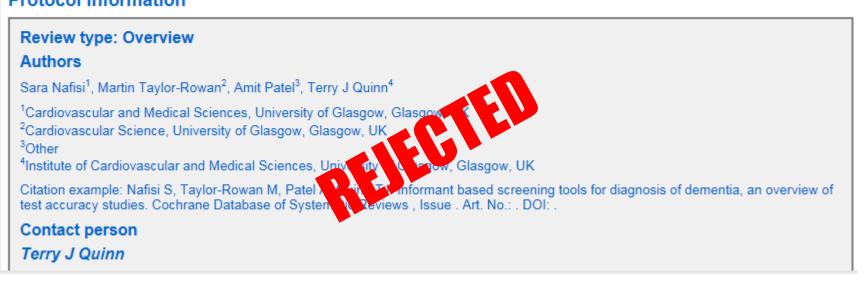
	То	Moira Sim;					
Send	Сс						
	Subject:	re: help with a Cochrane review					
Dear	Cochran	ne CRSU					
l wor	I wonder if you could help with a new review.						
We have published a number of DTA reviews looking at dementia diagnosis. We now want to collate all the reviews in an overview. We are especially keen to use the overview to allow comparisons of the accuracy of various tests.							
We d	lon't hav	e much experience in this area, so any help greatly appreciated.					
Let m	ne <mark>kno</mark> w	if you need more information from my end, happy to chat on 'phone.					
Best	wishes						
Terry	/						
On b	ehalf of (	Cochrane Dementia Group	-				
2	Moira Sim		۹.				



**Cognitive Improvement** 

### **Cochrane Dementia & Cognitive Improvement**

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



- Useful peer review
- Learned a lot about overview strengths , limitations and methodological challenges
- Liaise with Cochrane before doing anything too novel



- What are our most important reviews ?
- What are the strengths of the group ?
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# Cochrane

### Dementia and Cognitive Improvement





Organisation for Psychological Research into Stroke

### **Cochrane Dementia & Cognitive Improvement**



# Prioritising our stroke and VCI reviews

The Cochrane Dementia and Cognitive Improvement Group publish systematic reviews, metaanalyses and methodological guidance. Our remit extends beyond dementia and we are keen to develop our portfolio in the areas of vascular cognitive impairement 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.



2. Traditionally Cochrane has focussed 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) \*

	1	2	3	4	5
Clinical trials of treatment interventions	0	0	0	0	0
Clinical trials of preventative interventions	0	0	0	0	0
Studies of assessments /tests (test accuracy research)	0	0	0	0	0
Studies of opinions, experiences (qualitative research)	0	0	0	0	0
Studies of factors that predict outcomes (prognostic research)	0	0	0	0	0





Organisation for Psychological Research into Stroke



**Cognitive Improvement** 

### Cochrane Dementia & Cognitive Improvement

**Cochrane Database of Systematic Reviews** 

### 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 G

Am score 10

View article information

Gabriel Martínez | Robin WM Vernooij | View authors' declarations of interest **Cochrane Database of Systematic Reviews** 

# 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 🗗



Used in 1 guideline View article information

Craig Ritchie | Nadja Smailagic | Anna H Noel-Storr | Obioha Ukoumunne | Emma C Ladds | Steven Martin View authors' declarations of interest



**Cognitive Improvement** 

	То	Moira Sim;						
Send	Сс							
Jena	Subject:	re: help with a Cochrane review						
Dear	Dear Cochrane CRSU							
l wor	I wonder if you could help with a new review.							
		evelop a prognosis review. inergic burden for prediction of dementia/cognitive decline.	≡					
analy	sis aspec	It from Prognosis Methods group, but would be especially grateful for help with the meta- ct of the review.						
wed	ion't hav	e much experience in this area, so any help greatly appreciated.						
Let m	ne know	if you need more information from my end, happy to chat on 'phone.						
Best	Best wishes							
Terry		Cochrane Dementia Group						
2	Moira Sim		2 ^					

### **Cochrane Dementia & Cognitive Improvement**

Anticholinergic burden (prognostic factor) for prediction of dementia or cognitive decline in older adults with no known cognitive syndrome.

**Protocol information** 

 Review type: Flexible (Prognosis)

 Authors

 Terry J Quinn<sup>1</sup>, Phyo Kyaw K Myint<sup>2</sup>, Jenny McCleery<sup>3</sup>, Martin Taylor-Rowan<sup>4</sup>

 <sup>1</sup>Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK

 <sup>2</sup>Division of Applied Health Sciences, School of Medicine, Medical Sciences and Nutrition, University of Aberdeen, Aberdeen, UK

 <sup>3</sup>Oxford Health NHS Foundation Trust, Banbury, UK

<sup>4</sup>Cardiovascular Science, University of Glasgow, Glasgow, UK

Citation example: Quinn TJ, Myint PKK, McCleery J, Taylor-Rowan M. Anticholinergic burden (prognostic factor) for prediction of dementia or cognitive decline in older adults with no known cognitive syndrome.. Cochrane Database of Systematic Reviews , Issue . Art. No.: . DOI: .

- If you thought DTA was complex......
- New territory for NIHR CRSU
- Working in partnership with Prognosis Methods
- Watch this space



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