Cognitive rehabilitation: assessment
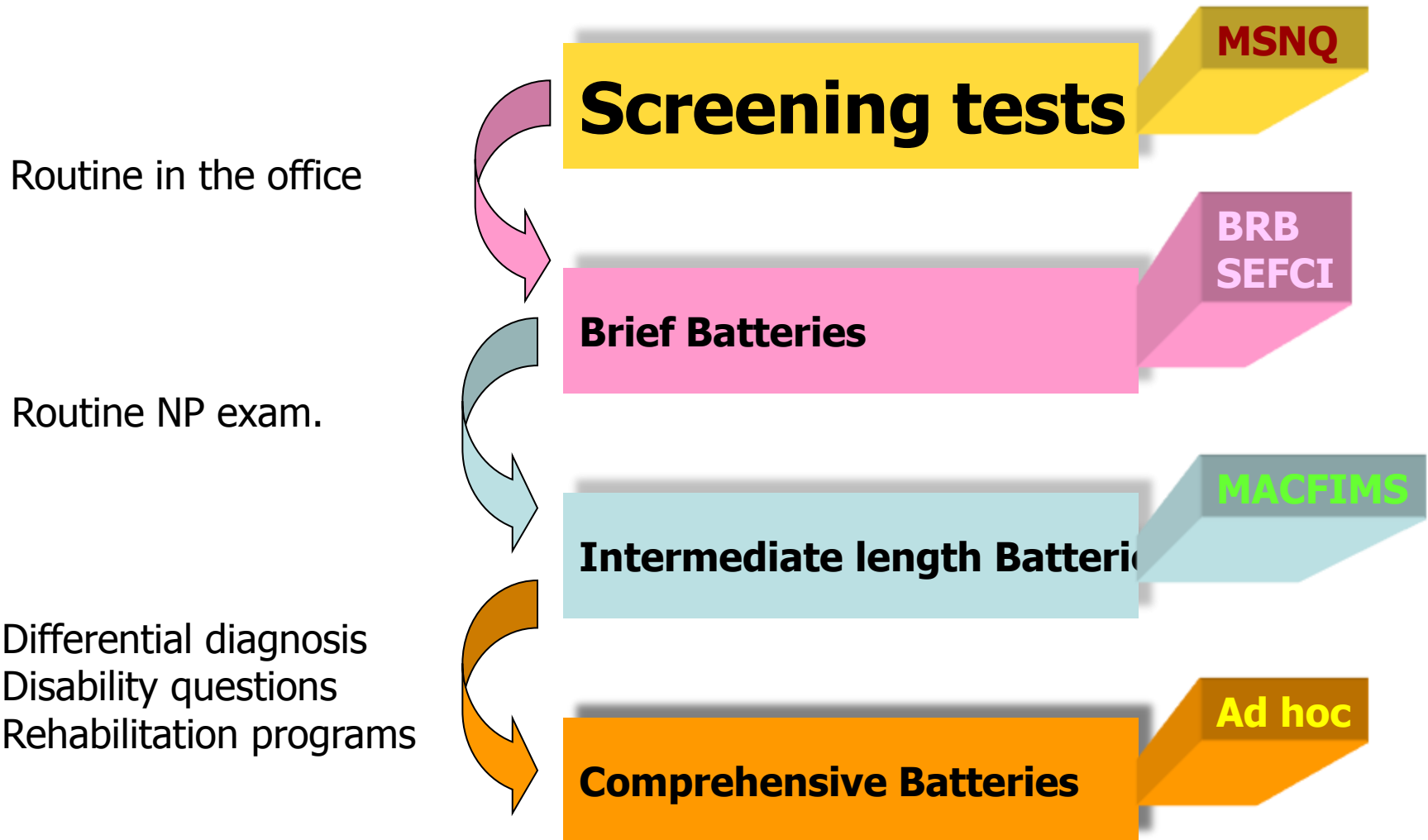
Dawn Langdon PhD

Royal Holloway
University of London

Assessment for cognitive rehabilitation

- Patient context
  - Individual
  - Family
  - Work
- Insight
- Mood
- Motivation
- Observation of patient performance
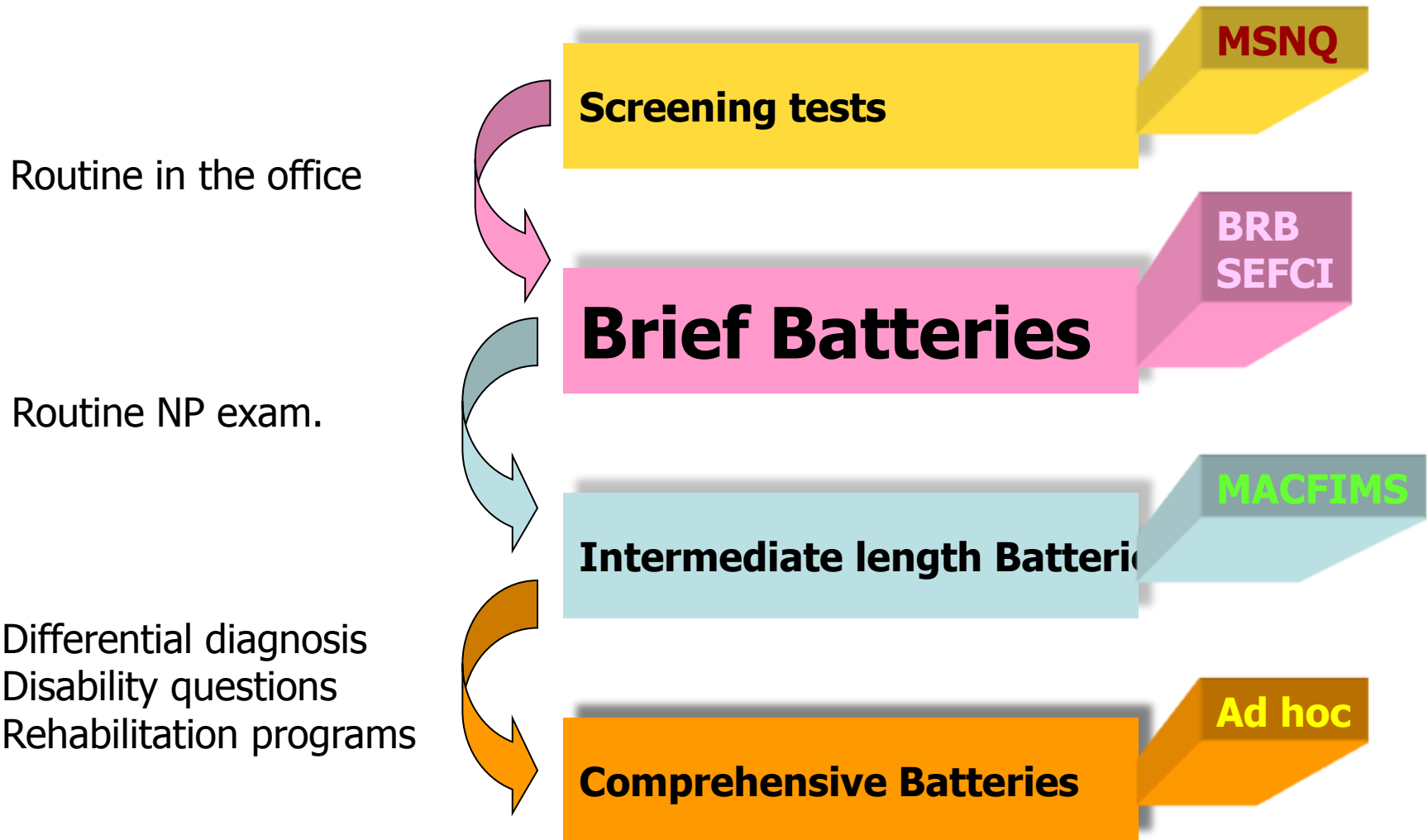- Rehabilitation resources
- Cognitive impairment profile

Assessment of Cognition

Routine in the office

Screening tests

MSNQ

Routine NP exam.

Brief Batteries

BRB
SEFCI

Intermediate length Batteries

MACFIMS

Differential diagnosis
Disability questions
Rehabilitation programs

Comprehensive Batteries

Ad hoc

MSNQ items

- Is easily distracted
- Loses focus when listening
- Is slow when problem solving
- Forgets shows or programs
- Forgets appointments
- Forgets what he reads
- Asks to repeat directions
- Must be reminded to do tasks

- Forgets errands
- Fails to answer questions
- Failure of dual tasking
- Misses point of conversation
- Problem controlling impulses
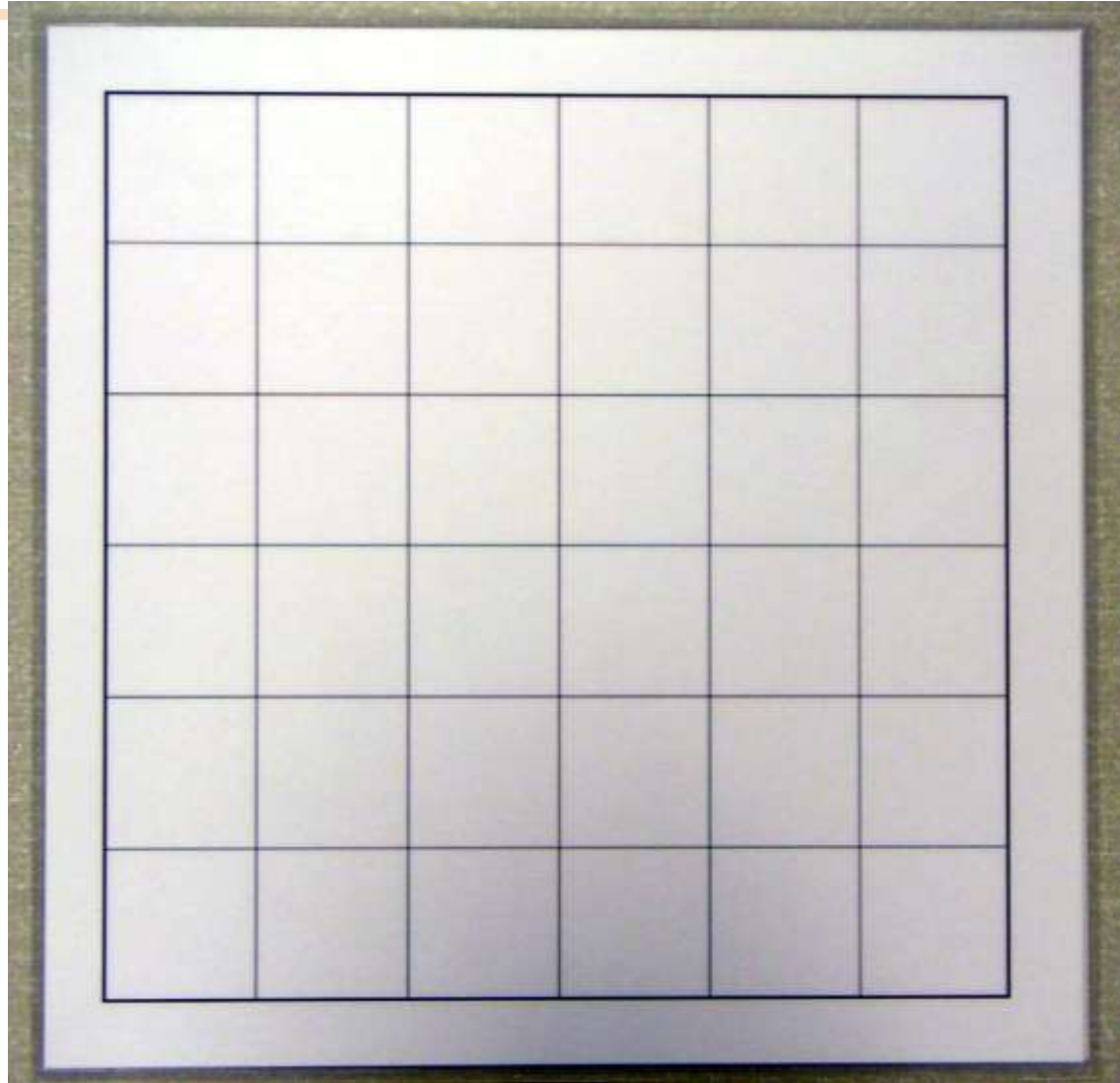- Laugh or cries easily
- Talks excessively

Benedict RH. Integrating cognitive function screening and assessment into the routine care of multiple sclerosis patients. CNS Spectr. 2005 May;10(5):384-91.

Assessment of Cognition

Routine in the office

Screening tests — **MSNQ**

Brief Batteries — **BRB SEFCI**

Routine NP exam.

Intermediate length Batteries — **MACFIMS**

Differential diagnosis
Disability questions
Rehabilitation programs

Comprehensive Batteries — **Ad hoc**

Selective Reminding Test

A	Words	1	2	3	4	5	6
	Butter						
	Arm						
	Shore						
	Letter						
	Queen						
	Cabin						
	Pole						
	Ticket						
	Grass						
	Engine						
	River						
	Brother						

	1	2	3	4	5	6
Long Term Storage						
Consistent Long Term Retrieval						

Benedict et al. Clin Neuropsychol 2002; 16: 381-97

10/36 Spatial Recall Test

Benedict et al. Clin Neuropsychol 2002; 16: 381-97

10/36 Spatial Recall Test
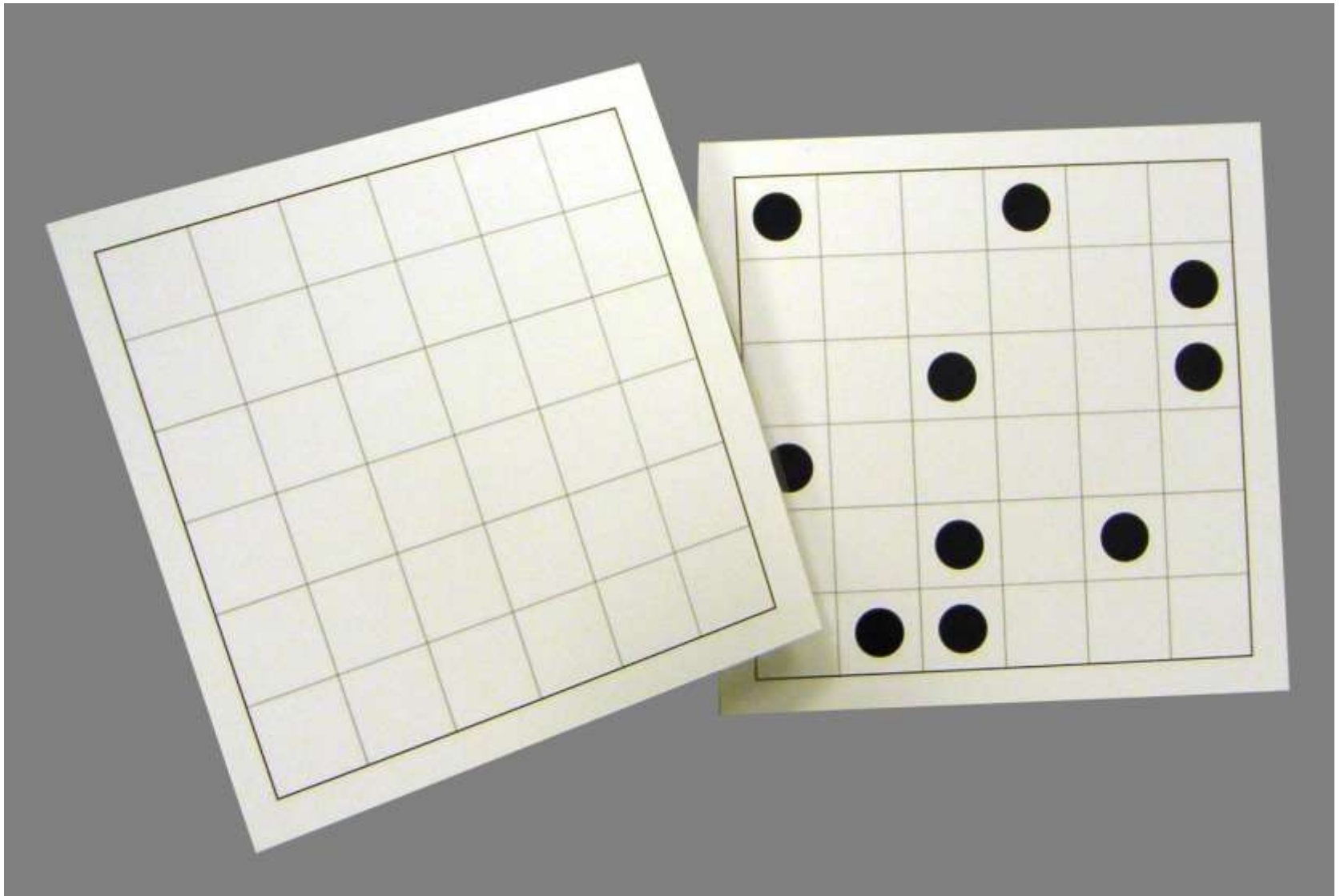
10/36 Spatial Recall Test
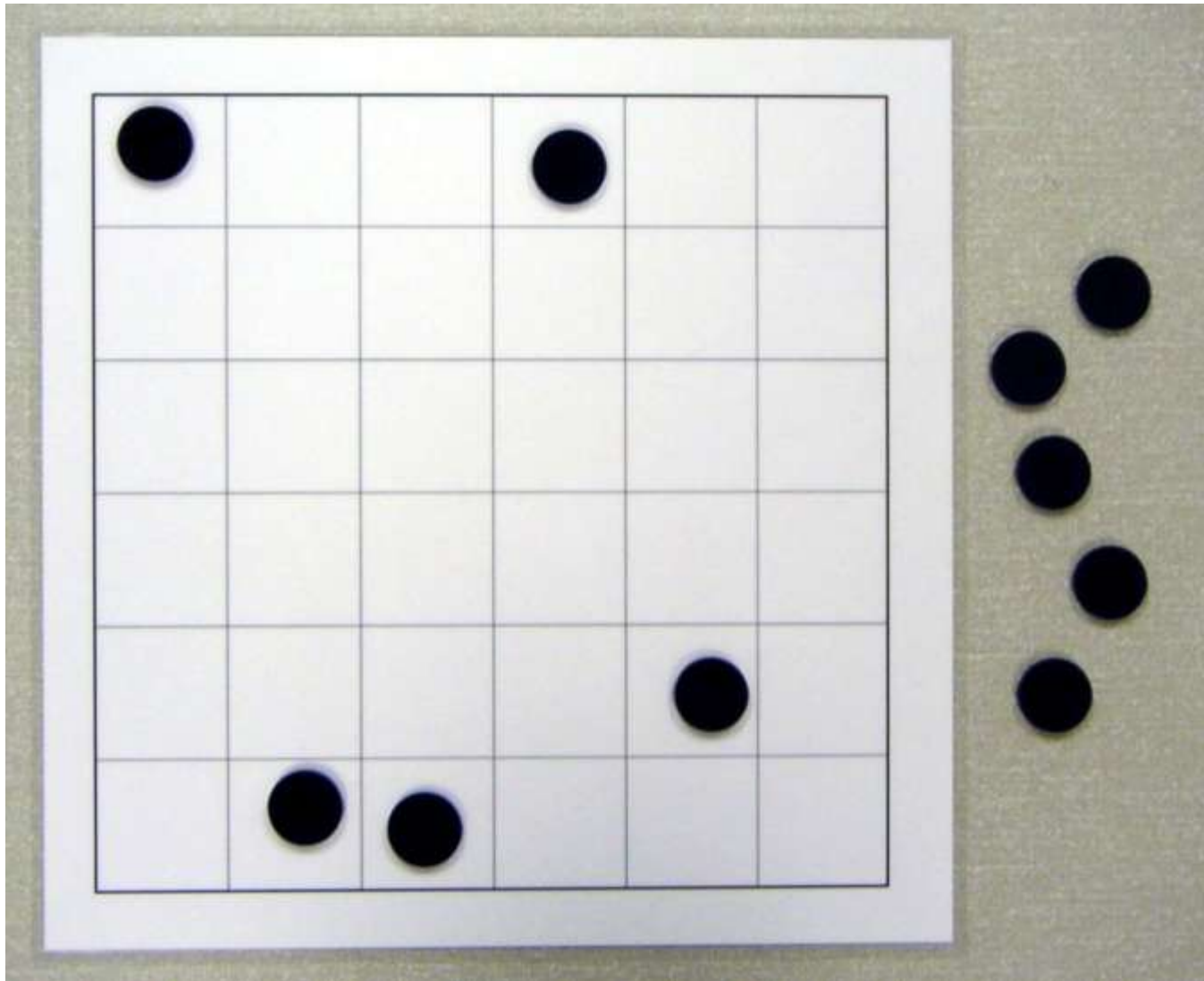
Symbol Digital Modality Test / A

Benedict et al. Clin Neuropsychol
2002; 16: 381-97

Paced Auditory Serial Addition Test

PASAT - Form A

1÷4	8	1	5	1	3	7	2	6.	9
(5)_	(12)_	(9)_	(6)_	6 _7	(4)_	(10)_	(9)_	(8)_	15 _17
4	7	3	5	3	6	8	2	5	1
(13)_	(11)_	(10)_	(8)_	(8)_	(9)_	(14)_	(10)_	(7)_	(6)_
5	4	6	3	8	1	7	4	9	3
(6)_	9 _10	(10)_	(9)_	(11)_	(9)_	(8)_	(11)_	(13)_	(12)_
7	2	6	9	5	2	4	8	3	1
(10)_	(9)_	(8)_	15 _NR	(14)_	(7)_	6 _11	(12)_	(11)_	(4)_
8	5	7	1	8	2	4	9	7	9
9 _12	(13)_	(12)_	(8)_	(9)_	(10)_	(6)_	13 _15	(16)_	16 _NR
3	1	5	7	4	8	1	3	8	2.
(12)_	(4)_	6 _9	12 _NR	(11)_	(12)_	(9)_	.4 _12	(11)_	(10)_

Total Correct (raw) = __49__

Benedict et al. Clin Neuropsychol 2002; 16: 381-97

COWAT

Assessment of Cognition

Routine in the office

Screening tests — **MSNQ**

Routine NP exam.

Brief Batteries — **BRB SEFCI**

Differential diagnosis
Disability questions
Rehabilitation programs

Intermediate length Batteries — **MACFIMS**

Comprehensive Batteries — **Ad hoc**
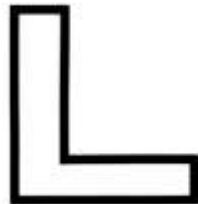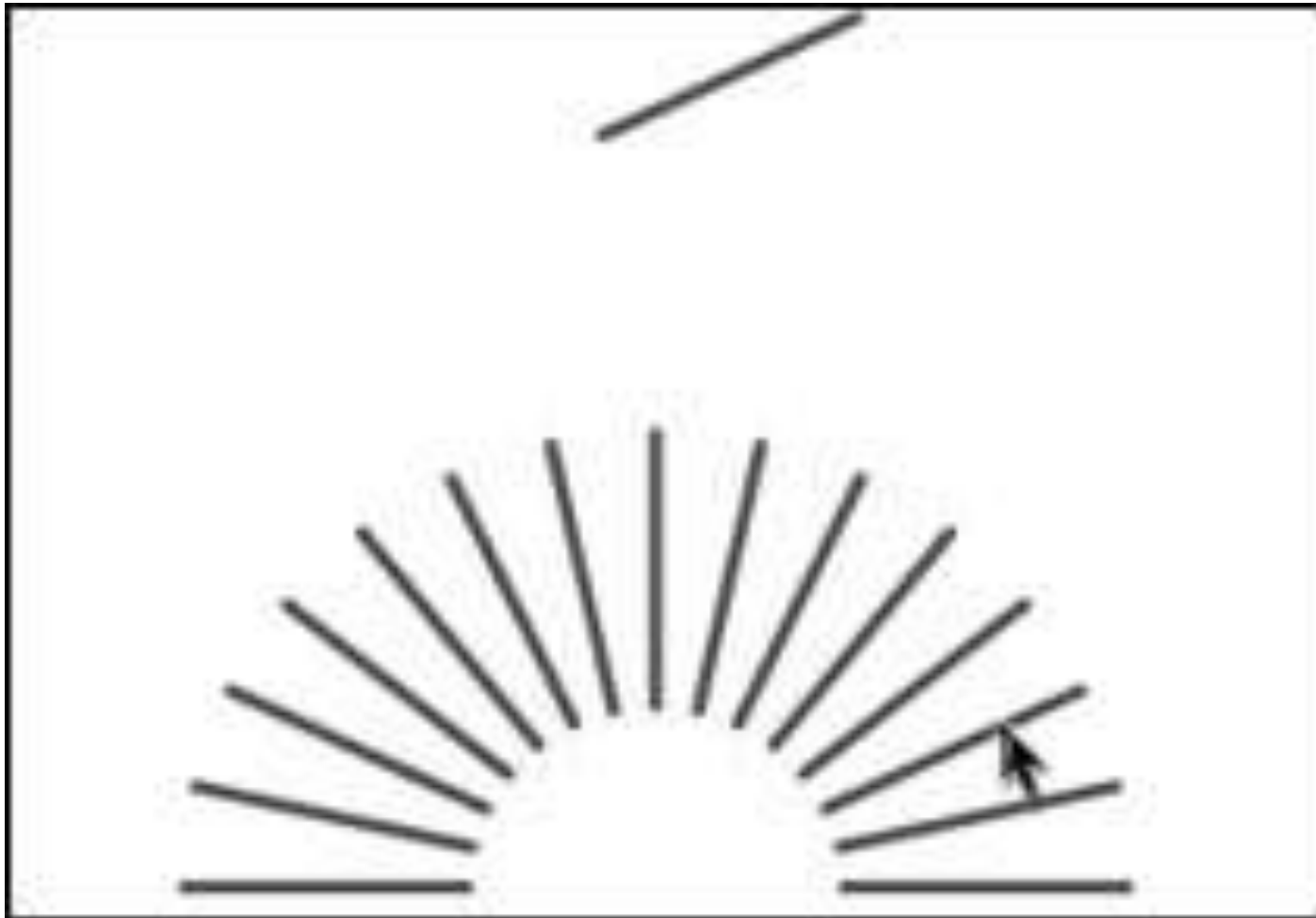
California Verbal Learning Test-II (CVLT II)

Truck
Spinach
Giraffe
Bookcase
Onion
Motorcycle
Cabinet
Zebra
Coach
Lamp
Celery
Cow
Desk
Boat
Squirrel
Cabbage

Benedict et al. Clin Neuropsychol 2002; 16: 381-97

Brief Visuospatial Memory Test (Revised)

Judgement of line orientation

Delis-Kaplan Executive Function System (D-KEFS)

Benedict et al. Clin Neuropsychol 2002; 16: 381-97

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Cognitive assessment for MS

- **Requires specialist training**
- **Time-consuming**
- **Not routinely available outside specialist centres**
- **Not comparable across countries**

BICAMS

Brief International Cognitive Assessment for MS

- **Identify a brief assessment tool for cognition in MS**
  - can be used by health care professionals who are not cognitive specialists
  - has international validation

- **Specify an international validation protocol that can be implemented in any country**

- **Agree guidelines on test-retest timing and clinically significant change**

BICAMS committee meetings and website are sponsored by Bayer Healthcare

BICAMS consensus criteria

- **Completed in 15 minutes**
- **No special equipment (beyond pen, paper, stopwatch)**
- **No specific assessor training for graduate health professionals**
- **Easily performed in a clinical setting**
- **Domains included:**
  - **Information processing speed**
  - **Verbal memory**
  - **Visual memory**

Langdon et al., Recommendations for a Brief International Cognitive Assessment for Multiple Sclerosis (BICAMS). MSJ 2012;18:891-1.

BICAMS
Brief International Cognitive Assessment for MS

- **Battery**
  - **SDMT**
  - **CVLT-II, first 5 recall trials**
  - **BVMTR, first 3 recall trials**

BICAMS committee meetings and website are sponsored by Bayer Healthcare

Recommendations for a Brief International Cognitive Assessment for Multiple Sclerosis (BICAMS)

DW Langdon[1], MP Amato[2], J Boringa[3], B Brochet[4], F Foley[5],
S Fredrikson[6], P Hämäläinen[7], H-P Hartung[8], L Krupp[9],
IK Penner[10], AT Reder[11] and RHB Benedict[12]

Abstract

Background: Cognitive impairment in MS impacts negatively on many patients at all disease stages and in all subtypes. Full clinical cognitive assessment is expensive, requiring expert staff and special equipment. Test versions and normative data are not available for all languages and cultures.

Objective: To recommend a brief cognitive assessment for multiple sclerosis (MS) that is optimized for small centers, with one or few staff members, who may not have neuropsychological training and constructed to maximize international use.

Methods: An expert committee of twelve members representing the main cultural groups that have so far contributed considerable data about MS cognitive dysfunction was convened. Following exhaustive literature review, peer-reviewed articles were selected to cover a broad spectrum of cultures and scales that targeted cognitive domains vulnerable to MS. Each was rated by two committee members and candidates scales were rated on psychometric qualities (reliability, validity, and sensitivity), international application, ease of administration, feasibility in the specified context, and acceptability to patients.

Results: The committee recommended the Symbol Digit Modalities Test, if only 5 minutes was available, with the addition of the California Verbal Learning Test – Second Edition and the Brief Visuospatial Memory Test – Revised learning trials if a further 10 minutes could be allocated for testing.

Conclusions: A brief cognitive assessment for MS has been recommended. A validation protocol has been prepared for language groups and validation studies have commenced.

BICAMS committee meetings and website are sponsored by bayer Healthcare

Validity of BICAMS tests confirmed by routine 3T imaging

25 MS patients assessed on large battery

- **SDMT correlated with**
  - **Cortical lesion number**
  - **Cortical lesion volume**
  - **White matter lesion volume**

- **CVLT-2 (immediate and delayed scores) correlated with**
  - **Cortical lesion number**

- **BVMT-R (immediate and delayed scores) correlated with**
  - **Cortical lesion volume**
  - **White matter lesion volume**

Mike et al., Identification and clinical impact of multiple sclerosis cortical lesions as assessed by routine 3T MR imaging. AJNR. 2011;32:515-21

BICAMS
Brief International Cognitive Assessment for MS

- Identify a brief assessment tool for cognition in MS
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BICAMS
Brief International Cognitive Assessment for MS

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- Specify an international validation protocol that can be implemented in any country
- **Agree guidelines on test-retest timing and clinically significant change**

BICAMS committee meetings and website are sponsored by Bayer Healthcare

BICAMS national validations

Published	Collecting data/analysis	Discussion	
USA	Canada	Portugal	Peru
Iran	UK	Belgium	Oman
Czech Republic	Italy	Ireland	Poland
	Germany	Hungary	Romania
	Austria	Australia	Slovenia
		Egypt	Sweden
		Estonia	Turkey
		Lithuania	Brazil
		Norway	

BICAMS: improving quality of healthcare and research in MS cognition

- **Increasing patient access and equality**

  - **Cognitive assessment can be accessed by MS patients who do not attend specialist centres**

  - **Increased awareness of cognitive issues in health services, leading to better management**

  - **Psychometrically sound MS cognitive assessment available in many more countries**

- **Improving research**

  - **Cognitive data can be collected for national and international databases**

  - **Multinational studies can utilise comparable cognitive data**