

RBANS[®] UPDATE

Repeatable Battery for the Assessment
of Neuropsychological Status

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Webinar Goals

- Describe development and updates
- Describe the indexes and subtests of the RBANS Update;
- Discuss administration and scoring of the subtests;
- Discuss application of the results

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RBANS Development

- Dr. Randolph's work in Dementia Clinic in 1980s
- Available batteries: Stuck between mental status exam/scales and the Health Research Board
- "passing" MMSE or DRS no guarantee that early dementia *not* present.
- Apart from the MMSE, other neuropsychological test batteries (e.g., the Halsted Reitan), were typically very lengthy and overly difficult for an elderly impaired population.
- In addition, existing tools generally lacked:
 - alternate forms
 - ability to "profile" neurocognitive impairments

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(RBANS)[™]: Original Design Goals

- Administration time less than 30 minutes
- Level of difficulty appropriate for normal adult- moderately severe dementia
- Measurement of five neurocognitive domains, with scaled score profiles
- Alternate forms for repeat testing
- Portability for ease of bedside administration

Purpose of RBANS

- Stand-alone “core” battery: to detect and describe dementia in the elderly.
- Neuropsychological “screening battery:” when lengthier assessments are impractical or inappropriate.
- Brief neurocognitive assessment in various settings
- Tracking outcomes and recovery. Repeat evaluations: alternate forms.

RBANS[™] UPDATE

- Downward age extension to 12:0 years
- Equating studies for Forms C and D and Spanish A
- Individual Subtest scores now available in addition to index scores
- Revised manual with adolescent information and RBANS-specific research conducted since original 1998 publication.



RBANS UPDATE

Materials

Repeatability Battery for the Assessment of Neuropsychological Status Manual
Also includes Equating sample data for Forms B-D (alternate forms).

Stimulus Booklet A-D
Contains stimulus materials for Figure Copy, Line Orientation, and Picture Naming. Scoring Criteria for Figure Recall/Figure Copy and Normative Tables for ages 12-89 are also included. Spanish Form A and B are administered using the corresponding stimulus booklet.

Record Form A-D and Spanish Form A and B
(package of 25)

Coding Scoring Template A-D
Spanish Form A and B are scored using the corresponding template.

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Overview

RBANS Update provides a brief, individually administered battery to measure cognitive decline or improvement across these domains:

- **Immediate Memory** – List Learning and Story Memory
- **Visuospatial/Constructional** – Figure Copy and Line Orientation
- **Language** – Picture naming and Semantic Fluency
- **Attention** – Digit Span and Coding
- **Delayed Memory** – List Recall, List Recognition, Story Memory, and Figure Recall

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RBANS Domains

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    graph TD
      IM(Immediate Memory) --> TS((Total Scale))
      DM(Delayed Memory) --> TS
      AT(Attention) --> TS
      L(Language) --> TS
      VC(Visuospatial/Constructional) --> TS
  
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Figure 1.1 RBANS Domains

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Administration and Scoring

Repeating Instructions and Prompting

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Repeatable Battery for the Assessment
of Neuropsychological Status

All you need to administer



Stimulus & Norms

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General Information

- Only the stimulus booklet and record form are needed.
- Subtests ordered to speed administration-items in sequence in stimulus book.
- Total administration/scoring time 20-25 minutes.
- Index scores rapidly derived from subtest raw scores using tables in stimulus booklet appendix.
- Total scale score from sum of 5 index scores.

Domains and Subtests

Immediate Memory

- List Learning
- Story Memory

Visuospatial/Constructional

- Figure Copy
- Line Orientation

Language

- Picture Naming
- Semantic Fluency

Attention

- Digit Span
- Coding

Delayed Memory

- List Recall
- List Recognition
- Story Recall
- Figure Recall

Immediate Memory

List Learning

Goals: appropriate difficulty level, brevity, minimize cultural, educational influences.

- 10 word list, 4 learning trials
- words are: low age of acquisition, moderate imageability, unrelated, matched on lexical vars.
- no warning of later delayed recall

Immediate Memory

List Learning

Trial 1

Say I am going to read you a list of words. I want you to listen carefully and, when I finish, repeat back as many words as you can. You don't have to say them in the same order that I do—just repeat back as many words as you can remember, in any order. Okay?

Immediate Memory

List Learning

Trials 2–4

Say I am going to read the list again. When I finish, repeat back as many words as you can, even if you have already said them before. Okay?

Record responses in order.

Scoring: 1 point for each word correctly recalled on each trial.

Immediate Memory

Story Memory

Goals: difficulty level, length, ease of scoring, structure for alternate forms
– 12-item, verbatim scoring, repeated twice, standard structure

Immediate Memory

Story Memory

Trial 1

Say *I am going to read you a short story. I'd like you to listen carefully and, when I finish, repeat back as much of the story as you can remember. Try and use the same wording, if you can. Okay?*

Read the story below, then say *Now repeat back as much of that story as you can.*

Immediate Memory

Story Memory

Trial 2

Say *I am going to read that same story again. When I finish, I want you to again repeat back as much of the story as you can remember. Try to repeat it as exactly as you can.*

Read the story below, then say *Now repeat back as much of that story as you can.*

Immediate Memory

Story Memory

Scoring: 1 point for *verbatim* recall of bold, italic words or alternatives, shown below in color within parentheses. Record intrusions or variations in the Responses column.

Domains and Subtests

Immediate Memory

- List Learning
- Story Memory

Visuospatial/Constructional

- Figure Copy
- Line Orientation

Language

- Picture Naming
- Semantic Fluency

Attention

- Digit Span
- Coding

Delayed Memory

- List Recall
- List Recognition
- Story Recall
- Figure Recall

Visuospatial/Constructional

Figure Copy

Goals: level of difficulty, ease of scoring

- 10-item figure, 20 points total
- same components in alternate form figure
- scoring criteria on opposing face page for ease of use

Show examinee a multipart geometric drawing and ask examinee to make an exact copy while the drawing remains on display.

Visuospatial/Constructional

Figure Copy

- Fold back the page in the RF and present the *Figure Copy Drawing Page* (in RF) along with the *stimulus* (in Stimulus Book).
- Ask the examinee to make an exact copy of the figure.
- Tell the examinee that he or she is being timed, but that the score is based *only* on the exactness of his or her copy.

Visuospatial/Constructional

Figure Copy

Scoring:

- 1 point for correctness and completeness (drawing), and
- 1 point for proper placement.
- See Appendix 1 in Stimulus Booklets for complete scoring criteria and scoring examples.

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Visuospatial/Constructional

Line Orientation — 20 seconds per item

- Present the sample item, and say *These two lines down here (indicate) match two of the lines on top. Can you tell me the numbers, or point to the lines that they match?* Correct any errors and make sure the examinee understands the task.
- Continue with Items 1–10.
- Scoring: 1 point for each line correctly identified.

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Domains and Subtests

Immediate Memory

- List Learning
- Story Memory

Visuospatial/Constructional

- Figure Copy
- Line Orientation

Language

- Picture Naming
- Semantic Fluency

Attention

- Digit Span
- Coding

Delayed Memory

- List Recall
- List Recognition
- Story Recall
- Figure Recall

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Language

Picture Naming — 20 seconds per item

- Ask examinee to name each picture.
- Give semantic cue only if picture obviously misperceived.
- Scoring: 1 point for each item named spontaneously or following semantic cue.

Language

Semantic Fluency

Goals: minimize retrieval (“frontal”) demands, scoring dilemmas

- “animals in a zoo” or “fruits and vegetables”
- alternate form matching challenge
- aside: re parsing retrieval demands vs. semantic stores . . .

Language

Semantic Fluency

Now I'd like you to tell me the names of all of the different kinds of fruits and vegetables that you can think of. I'll give you one minute to come up with as many as you can. Ready?

Scoring: 1 point for each correct response.

Domains and Subtests

<p>Immediate Memory</p> <ul style="list-style-type: none"> - List Learning - Story Memory <p>Visuospatial/Constructional</p> <ul style="list-style-type: none"> - Figure Copy - Line Orientation <p>Language</p> <ul style="list-style-type: none"> - Picture Naming - Semantic Fluency 	<p>Attention</p> <ul style="list-style-type: none"> - Digit Span - Coding <p>Delayed Memory</p> <ul style="list-style-type: none"> - List Recall - List Recognition - Story Recall - Figure Recall
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Attention

Digit Span

Goals: brevity, difficulty level

- forward span only
- one trial at each string length unless failed
- range restriction offset by index combination
 - trade-off is combining working memory/proc speed

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Attention

Digit Span

- **Say** *I am going to say some numbers, and I want you to repeat them after me. Okay?*
- Read the numbers at the rate of 1 per second. Only read the second string in each set if the first string was failed.
- Discontinue after failure of both strings in any set.
- Scoring: 2 points for the first string correct, 1 point for the second string correct, and 0 points for both strings failed.

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Attention

Coding

Goals: brevity, stimuli adequately sized, minimize impact of visuospatial skills, praxis

- analogous to digit symbol
- demonstration, practice, 90 seconds to complete

Domains and Subtests

Immediate Memory

- List Learning
- Story Memory

Visuospatial/Constructional

- Figure Copy
- Line Orientation

Language

- Picture Naming
- Semantic Fluency

Attention

- Digit Span
- Coding

Delayed Memory

- List Recall
- List Recognition
- Story Recall
- Figure Recall

Delayed Memory Index

- *List Recall* – recall words from List Learning
- *List Recognition* – read 20 words (10 targets, 10 distracters) and ask examinee to say **Yes** if word was on original list and **No** if word was not on list.
- *Story Recall* – retell story learned earlier
 - cue given – tell me that story about a fire . . .
- *Figure Recall* – draw from memory figure shown earlier.





Technical Information

Standardization

Original Normative Sample N=540

- ages 20-89 (6 groups of N=90)
- multiple sites from four U.S. geographic regions
- US census-matched for sex, education, and race/ethnicity

Additional sample of 150 adolescents to expand normative age range for Update

- ages 12-19 (3 groups of 50)
- approximately equal proportions of males and females
- multiple sites from four U.S. geographic regions
- US census-matched for parent education, and race/ethnicity

Standardization Exclusionary Criteria

- No evidence of recent decline in cognitive or functional abilities
- No uncorrected hearing loss
- No uncorrected visual impairment
- Able to comprehend English
- No current diagnosis or history of alcohol or drug dependence
- No history of head injury involving loss of consciousness
- No current major psychiatric illness
- No history of stroke
- No history of epilepsy
- No history of CNS infection (e.g., meningitis, encephalitis)
- No CNS disease
- Not currently taking antidepressant medication
- Not currently taking antipsychotic medication

Special Group Studies

Clinical sample in manual N=404

- Alzheimer's Disease
 - Vascular Dementia
 - HIV Dementia
 - Huntington's Disease
 - Parkinson's Disease
 - Depression
 - Schizophrenia
 - Closed Head Injury
- Reliability, test-retest stability, form equivalence, index score difference distributions established.
 - Tables of index score means by age and education level for both normative samples.

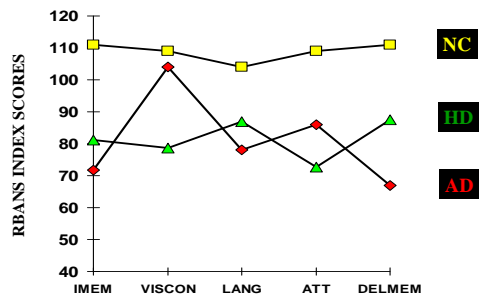
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Clinical validity

- One important goal was the ability to "profile" dementia, as an aid in differential diagnosis and treatment planning.
- Ideal initial group comparison is HD vs AD, for lack of dx overlap and distinct neuropathologies.

RBANS dementia profile comparison (from Randolph et al., 1998)



Performance of Sample Schizophrenia

RBANS Indexes	Mean	SD
Immediate Memory	73.8	18.3
Visuospatial/Constructional	82.5	21.1
Language	83.5	17.5
Attention	77.2	17.5
Delayed Memory	74.9	19.1
Total Scale	72.8	16.6
N = 59		

Performance of Sample Depression

RBANS Indexes	Mean	SD
Immediate Memory	93.2	11.9
Visuospatial/Constructional	101.8	11.9
Language	88.9	19.4
Attention	92.8	18.4
Delayed Memory	91.9	9.9
Total Scale	91.4	13.2
N = 13		

Application to Neurocognitive evaluations

- Design goals of brevity, targeted difficulty level, portability, ease of administration/scoring make this useful for dementia and other neurocognitive evaluations.
- Clinical validity well-established (over 100 peer-reviewed references: check manual + www.rbans.com for additional information)
- Multiple publications validating the utility of the RBANS in dementia diagnosis/treatment planning (e.g., discriminability in mild dementia, prediction of functional ADLs, driving, correlation with biomarkers, etc.). See Appendix C in RBANS Update Manual.

General Interpretation

- Primary focus is on the Index level measures
- Subtest interpretation should be done judiciously

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Qualitative Description of RBANS Index Scores

Index Score	Classification
130 and above	Very Superior
120-129	Superior
110-119	High Average
90-109	Average
80-89	Low Average
70-79	Borderline
69 and below	Extremely Low

Classification Descriptors for Subtest Scaled Scores

Index Score	Classification
16 and above	Very Superior
14-15	Superior
12-13	High Average
8-11	Average
6-7	Low Average
4-5	Borderline
3 and below	Extremely Low

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Classification Descriptors for Percentile Bands

Percentile Bands	Band Descriptor
> 75	High Average
26-75	Average
10-25	Low Average
3-9	Borderline
≤ 2	Extremely Low



Application

Male 20 years old

RBANS Index	Score
Immediate Memory	100
Visuospatial/Constructional	112
Language	100
Attention	88
Delayed Memory	90
Total Score	96

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of Neuropsychological Status

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