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Mini-Mental State Exam (MMSE)

Tech-Administered

A. Background and Rationale:

Cognitive function may decline as a result of certain risk factors (e.g. hypertension, elevated cholesterol, cardiac arrhythmias). This in turn could adversely impact the physical functioning and quality of life of older adults. Dementia is a major illness and cause of disability among the elderly. Cerebrovascular disease or multi infarct dementia is the second leading cause of dementing illness among Caucasians, preceded only by Alzheimer's disease.

The Mini-Mental State Exam (MMSE) is a widely used test of cognitive function among the elderly; it includes tests of orientation, attention, memory, language and visual-spatial skills.

B. Definitions:

1. **Alert Level:** In general participant scoring below education-adjusted cut-off scores* on the MMSE may be cognitively impaired.

MMSE-EDUCATION ADJUSTED CUT-OFF SCORES

- a. Subjects whose education levels are **7th grade or lower**, a score on the **MMSE of 22 or below**
- b. Subjects whose education attainment level is **8th grade or some high school** (but not a graduate of), a score on the **MMSE of 24 or below**
- c. Subjects whose education attainment level is **high school graduate**, a score on **the MMSE of 25 or below**
- d. Subjects whose education attainment level is **some college or higher**, a score on the **MMSE of 26 or below**.

***Note: The Education Adjusted Cut-off Scores are calculated by data management.**

2. **Mini-Mental State Exam Scoring:**

The official total score for the MMSE (i.e. the scores used for statistical analyses) are computer generated. Examiners record individual test item scores on the MMSE test form. The one exception is "WORLD" where examiners record the response of subjects in the exact order that it is given by the subject.

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For **referral purposes**, any participant with a drop of 3 points in score since their last exam should be referred to neurology group. A preliminary score can be calculated by Tricia Kelly to determine if the participant should be referred. A referral form should be completed and given to the Neuro Project Coordinator, Linda Farese, after the exam. Referral forms can be found in the appendices.

If a participant is referred they may also qualify for a consent form Waiver.

3. **Consent Form Waiver:**

Guidelines dated 3/10/01 verified 3/25/04:

Any subject with MMSE at or above 26 may be presumed competent unless listed otherwise at last evaluation

Any subject with MMSE below 13 requires use of a Waiver unless seen by a neurologist and declared not demented

MMSEs between 25 and 13 would trigger a decision process. The participants in this category will sign a consent but they may qualify for a waiver. The neurology team will review each case and decide which category to be in (Consent or Waiver).

Refer to Waiver of Informed Consent Section of manual for full protocol.

C. Methods:

1. The MMSE asks questions to ascertain cognitive status. Responses are scored:
 - 0=incorrect
 - 1=correct
 - 6=item administered, participant does not answer
 - 9=test item not administered/unknown
2. If a response is ambiguous, the interviewer records the response in the margin so a decision can be made on its appropriateness. Please refer all questionable responses to the neuropsychologists (i.e. Rhoda Au or Sherral Devine)
3. When a participant is incapacitated by blindness, has a functional disability, is illiterate, or is otherwise unable to respond to a question, the interviewer should specify the problem and questions involved (see "Factors Potentially Affecting Mental Status Testing" later in the section).

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D. Expanded Scoring Instructions for Mini-Mental Exam:

Important note: The single exception to scoring 6 for no response is if a participant is in a coma (this circumstance would be encountered in a nursing home visit) In this instance, administer the first item (to establish no response -- give a 0 to the first item if there is no response). (This exception is made to conform with the stroke protocol.)

9 = When test item was not administered (refused or inability because of physical limitations) or subject's response is uninterpretable (response could be correct, but tester is unable to discern the response).

Important note: Sometimes a participant might produce a response that is not a word (i.e. a neologism) but has been responding with intelligible responses on previous items (right or wrong). In this case the items should be scored 0. The key to differentiating a 0 or a 9 is consistency within test. If a person has a speech abnormality, such as aphasia or dysarthria, across all items, most (or many) responses will be unintelligible. If a person is, for example, demented, he/she may produce a flow of intelligible responses with occasional unintelligible responses. A "9" must represent situations in which the EXAMINER is not sure whether (1) the participant responded correctly (because of slurred speech, severe stuttering, etc.), or (2) if the participant has some other factor that prevents test item administration (such as an inability to administer *copy this figure* test item to a right-handed person who has right-handed paralysis, or to someone who has a visual impairment or inability to hear).

Scoring for Administered Individual Items: (applies only if a test item is administered)

Score 0 for the following reasons:

1. Incorrect response
2. *I don't know*
3. Unintelligible response in context of other intelligible responses (see scoring of 9 as well).
4. Participants attempted to respond but responds incorrectly (i.e. they are demonstrating that they heard the question and are making an attempt to respond to it).

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E. Questions: Scripts and Procedures for Each Question:

Introductory Script: *I'm going to start by asking questions that require concentration and memory. Some questions are more difficult than others and some will be asked more than one time.*

Read each question on the form.
Record the response on the form.

1. *What is the date today?* (3 = correct score for month (1 pt), day (1 pt) and year (1 pt))

- a. Ask for the date. Then ask specifically for parts omitted (e.g. *Can you also tell me what month, year it is?*)
- b. If participant supplies part or all of the date (e.g. month and day, or month, day, and year), record as appropriate and do not ask those questions again.

2. *What is the season?*

Since distinctions between seasons can be difficult during certain months, one week leeway is allowed on either side of the actual date.

<u>Month</u>	<u>Correct Response</u>
January	Winter
February	Winter
March	Winter or Spring
April	Spring
May	Spring
June	Spring or Summer
July	Summer
August	Summer
September	Summer or Fall
October	Fall
November	Fall
December	Fall or Winter

3. *What day of the week is it?*

4. *What town, county, and state are we in?*

- a. Ask the participant what town, county, and state we are in.
- b. For offsite visits, refer to the section of the manual titled "New England Counties" for a complete list of all counties.

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5. *What is the name of this place?*
 - a. Ask the participant where they are. Any appropriate answer is okay. On home visits, the examiner can ask, *What is the address of this place?*

6. *What floor of the building are we on?*

7. *I am going to name 3 objects. After I have said them I want you to repeat them back to me. Remember what they are because I will ask you to name them again in a few minutes: Apple, Table, Penny.*
 - a. Make sure participant is attentive when beginning the question.
 - b. Read the list of objects slowly. DO NOT REPEAT ITEMS UNTIL AFTER THE FIRST TRIAL.
 - c. If participant asks you to repeat the 3 items, respond, *Can you tell me the items I just mentioned?* or *Just do the best you can.*
 - d. Read *Apple, Table, Penny.*
 - e. Script: *Could you repeat the three items for me?*
 - f. Record the score for the first trial.
 - g. If, after scoring the first attempt, the participant has not learned the 3 objects, repeat the list of objects up to 6 times until he/she has learned them.
 - h. If, 3 items are repeated regardless of order, score 3 points. Occasionally hearing impairments prevent subjects from correctly hearing test questions (for example, when asked to repeat three items, *apple, table, penny*, they may repeat *April, tablet, pencil* -- these alternate responses should be accepted both under the repetition and recall conditions).

8. *Now I am going to spell a word forward and I want you to spell it backwards. The word is WORLD. W-O-R-L-D. Please spell it in reverse order. Write in letters _____ (letters are entered and computer scored later. For tabulating a total MMSE score for screening purposes, please determine a total score between 0-5 for this item).*
 - a. Read the question slowly. Where *world* has hyphens between the letters, spell out the word.
 - b. Repeat the spelling if necessary.
 - c. Record the participant's response. Write in the letter as the participant has spelled the word.

9. *What are the 3 objects I asked you to remember a few moments ago?*
 - a. Items may be repeated in any order.

10. *What is this called?* (Watch)

Show the wristwatch to the participant

Correct responses include: watch, wristwatch, timepiece

Code 1 = correct answer

11. *What is this called?* (Pencil)

- a. Show the pencil to the participant. NOTE: the pencil should be a standard sharpened wooden pencil with eraser.
- b. Correct responses include: Pencil, number 2 pencil
- c. Code 1 = correct for correct answer.

12. *Please repeat the following: No ifs, ands or buts.*

- a. Enunciate clearly -- include the "S" at the end of *ifs*, *ands*, or *buts*, (if you think the participant heard you but repeated it incorrectly, make a note of what was missed and score 0).
- b. Allow only **one** attempt.
- c. Code 1 = correct when the participant correctly repeated the phrase.
- d. Code 0 = incorrect when the participant did not repeat the phrase exactly.

Occasionally hearing impairments prevent participants from correctly hearing test questions. In the case of repeating *no ifs, ands, or buts*, some judgment must be made on the part of the examiner as to whether the participant could hear the "s" or not.

13. *Please read the following and do what it says.*

- a. Hand participant the "Please Close Your Eyes" card.
- b. The participant may read the sentence out loud. The task to be coded is the participant's ability to follow instructions by closing his/her eyes. It is not necessary for the sentence to be read out loud if the participant performs the function properly.
- c. Code 1 = correct when the participant closes his/her eyes.
- d. Code 0 = incorrect when the participant did not close his/her eyes.

14. *Please write a sentence.*

- a. Script: *Write any complete sentence on this piece of paper for me.*
- b. Repeat the instructions to participant if necessary.
- c. Code 1 = correct if the participant wrote a complete sentence as directed.

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- d. Written commands, such as *sit down*, where the subject is implied, are considered correct responses.
 - e. Spelling and/or punctuation errors are not counted as errors.
 - f. Code **0** = incorrect when the participant did not write a complete sentence as directed.
 - g. Code **1** = if the participant is cognitively able to dictate a sentence but is physically unable to write it. In this case the examiner should write the dictated sentence and make a note that it was dictated.
- Code **6** = Low vision

15. *Please copy this drawing.*

- a. Script: *Here is a drawing. Please copy the drawing on the same piece of paper.*
- b. If the participant asks if the figures should be drawn separately or together the examiner should respond, *Draw the figures as you see them.*
- c. To be correct, each pentagon must have 5 sides, 5 sides that point outward. The two figures must be overlapping.
- d. The overlap figures must have 4 sides.
- e. Code "**0**" = incorrect when the participant's figure did not match.

16. *Take this piece of paper in your right hand, fold it in half with both hands, and put it in your lap.*

(If participant is unable to use right hand because of physical disability, you can alter instructions to read "Take this piece of paper in your left hand, fold it in half with your left hand, and put it in your lap". The goal is to see whether the subject is able to follow a 3-step command, so this variation to the directions to accommodate subject's physical limitations is allowable.)

- a. Read the full statement **BEFORE** handing the paper to the participant.
- b. **DO NOT** direct the paper to participant's right side. Hold the paper in front and have the participant reach out to take it. Observe which hand is used.
- c. **DO NOT** repeat instructions or coach participant. Only repeat if the examiner felt it was not heard or if instructions were not given clearly (just repeat the directions in full as they were the first time).
- d. Score: **1** for each correctly performed act (code **6** if low vision).

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F. Factors Potentially Affecting Mental Status Testing

The examiner's impression for Cohort Cycle 28 will include the following:

<u>NO</u>	<u>YES</u>	<u>MAYBE</u>	<u>UNKNOWN</u>	
0	1	2	9	Illiteracy or low education
0	1	2	9	Not fluent in English
0	1	2	9	Poor eyesight
0	1	2	9	Poor hearing
0	1	2	9	Paralysis
0	1	2	9	Depression/Possible Depression
0	1	2	9	Aphasia
0	1	2	9	Coma
0	1	2	9	Parkinsonism or neurological impairment
0	1	2	9	Other

Note: Questions cannot be answered by a proxy.

h594

PLEASE CLOSE YOUR EYES

Cognitive Function--Part I

OMB NO=0925-0216 12/31/2007

I'm going to start by asking questions that require concentration and memory. Some questions are more difficult than others and some will be asked more than one time.

h581

<input type="text"/>	Examiner's Number for Cognitive Function -- Part I+II
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SCORE CORRECT: No Try=6 Unknown=9	Write all responses on exam form (score 1 point for each correct response)
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0 1 2 3 6 9 **What Is the Date Today?** (Month, day, year, correct score=3)

h583

0 1 6 9 **What Is the Season?**

h584

0 1 6 9 **What Day of the Week Is it?**

h585

0 1 2 3 6 9 **What Town, County and State Are We in?**

h586

0 1 6 9 **What Is the Name of this Place?**
 (any appropriate answer all right, for instance my home, street address, heart study..max score=1)

h587

0 1 6 9 **What Floor of the Building Are We on?**

h588

0 1 2 3 6 9 **I am going to name 3 objects. After I have said them I want you to repeat them back to me. Remember what they are because I will ask you to name them again in a few minutes: Apple, Table, Penny**

h589

Now I am going to spell a word forward and I want you to spell it backwards. The word is world. W-O-R-L-D. Please Spell it in Reverse Order. Write in Letters, _____ (Letters Are Entered and Scored Later)

Score as | 66666=Not administered for reason unrelated to cognitive status
 | 00000=Administered, but couldn't do
 | 99999=Unknown

h590

0 1 2 3 6 9 **What are the 3 objects I asked you to remember a few moments ago?**

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Cognitive Function --Part II

OMB NO=0925-0216 12/31/2007

SCORE CORRECT No Try=6 Unknown=9		Write all responses on exam form.
h591	0 1 6 9	What Is this Called? (Watch)
h592	0 1 6 9	What Is this Called? (Pencil)
h593	0 1 6 9	Please Repeat the Following: "No Ifs, Ands, or Buts." (Perfect=1)
h594	0 1 6 9	Please Read the Following & Do What it Says (performed=1, code 6 if low vision)
h595	0 1 6 9	Please Write a Sentence (code 6 if low vision)
h596	0 1 6 9	Please Copy this Drawing (code 6 if low vision)
h597	0 1 2 3 6 9	Take this piece of paper in your right hand, fold it in half with both hands, and put in your lap (score 1 for each correctly performed act, code 6 if low vision)

No	Yes	Maybe	Unk	Factor Potentially Affecting Mental Status Testing	
(coding below)					
h598	0	1	2	9	Illiterate or low education
h599	0	1	2	9	Not fluent in English
h600	0	1	2	9	Poor eyesight
h601	0	1	2	9	Poor hearing
h602	0	1	2	9	Depression / possible depression
h603	0	1	2	9	Other, write in _____

TECH10

OMB NO=0925-0216 12/31/2007

Sentence and Design Handout for Participant

PLEASE WRITE A SENTENCE

h595

PLEASE COPY THIS DESIGN

h596

