Manual/QxQ for the Neurocognitive Phone Battery and Neurocognitive Summary Form

I. PHONE BATTERY LIST/MANUAL CONTENTS
- Introductory Script Document
- ESU
- MME/CDP Hybrid (MCHT)
- CERAD-Immediate
- Digits Backward
- CERAD-Delayed
- Oral Trails A & B
- Verbal Fluency
- Animal Naming
- Optional Break
- CEST
- Remainder of CDP form
- Certification and Quality Control

II. MATERIALS
- Neurocognitive Test Phone Battery Examiner's Packet (Printed PDF)
- watch or clock with current time
- Digital audio recorder (for QC)
- Do Not Disturb sign (for door)
- Clipboard
- Stop watch
- Headset or earphones
- Cellphone stand (as needed)
- Black Pen

III. GENERAL INSTRUCTIONS
A. All neurocognitive measures are performed on paper. Affix a participant ID label to the first page of the Neurocognitive Test Battery Examiner's Packet, or complete the header information if labels are not available.

B. A trained examiner administers the cognitive function tests in a fixed order, one right after the other, during a single session in a quiet room.

C. Forms of participants who refuse to do all of the neurocognitive measures are set to permanently missing in the DMS.

D. Responses are recorded on the paper test packet by the examiner and kept in the participant's folder. Test results are tabulated and scored by the examiner after the phone call is completed.

E. For the examiner's environment: Testing should be conducted in a quiet area free of extraneous background noise and interruptions, as these distractions may affect test results. The location where the telephone assessment call is made should be acoustically favorable. Smaller rooms are acoustically preferred to large open rooms. It may also be helpful to place a "Quiet Please" sign on the door where the phone call is conducted.

F. Examiners should use a telephone headset with earphones (or earbuds) so that they may remain hands-free to write down the participant's responses. This will also provide better voice clarity, a consistent distance to the examiner microphone (so that the examiner's voice does not fade in and out), and improved ability to hear the participant.

G. The examiner may need to experiment with the participant to determine the best way to position their phone to best hear the participant. Options may include using the speakerphone or earbuds. (Note: the risk of inadvertent disconnection may be reduced, if the participant is hands-free). Using the telephone may be awkward for some examinees due to physical limitations.

H. Examiner rate of speech and clarity:
   1. The examiner's rate of speech over the telephone should be slower than face-to-face.
   2. Instructions and stimulus items should be stated clearly. Enunciate each word. To be fully understood, certain letters or syllables (e.g., on a word list memory test) may need to be slightly exaggerated to be fully understood.
   3. Often, a slightly lower tone of voice may be more easily understood than simply speaking more loudly.

I. For the participant's environment: They should be alone in a quiet room, free from distractions if possible (e.g., other family members, pets, TV or computer, etc).

J. The ppt should be advised not to use any aids during the assessment (except for hearing aids).

K. The participant should be instructed to speak closely to the microphone. Periodically throughout the battery, you may need to remind the participant to speak more loudly or directly into the microphone. (If this occurs during a timed task, do not stop timing.)

L. With the participant's permission, each telephone examination should be recorded. Recordings will be used both for QC as well as for examiners to review their scoring or to review parts of the exam that were perhaps poorly heard during active test administration.

M. A good quality stopwatch is necessary to time components of the cognitive function exam. The stopwatch should be simple to use, easy to read, and one that allows the examiner to begin and end timing silently (some stopwatches produce a sound upon starting and stopping).

N. Always read scripts exactly as written (all scripts are in bold). The scripts should be memorized where possible so that the delivery is fluid and sounds less formal than reading from a script.

O. Attempt every test with each participant. However, the examiner may discontinue any test for a variety of reasons as noted on the summary form. In addition, if it becomes apparent that the participant has substantial cognitive impairment (at any point during the assessment) and will be unable to complete the test battery, the full assessment may be discontinued. In which case, each of the measures should be marked as discontinued due to task difficulty on the summary scoring sheet.

P. There are a variety of issues that may affect a participant's cognitive performance. These issues may not rise to the level of discontinuing a given test, but may be worth noting, if the examiner believes they may have significantly affected the participant's test results. At the end of the telephone battery, the examiner will have the opportunity to record their impression about various potential threats to test validity.

Q. Although time limits are set for some tests, the participant should never be told of any time limit on any measure.

R. With the exception of when a fixed time limit has expired on a task, self-correction is routinely accepted.

S. Participants are often curious as to how well they did. Although scoring does not take place

during testing, the interviewer should reassure each participant who asks that he/she did about as well as many others who have taken the tests. Do not indicate to the participant whether specific responses are correct or incorrect or whether scores are high or low. For participants who express concern that they may have performed poorly on the tests, they may be reassured that the tests are designed to be difficult enough that very few people get all of the questions correct.

T. Most participants will feel challenged, however, some may feel insecure and others possibly hostile. It is important for the examiners attitude to be friendly, non-threatening, reassuring and supportive throughout the testing. Examiners should be sensitive to provide positive reinforcement (e.g., "you're doing fine") as appropriate throughout testing.

U. It is important that scores accurately reflect the participant's responses. Listening carefully and sometimes further prompting is needed to clarify a participant's response.

   1. If a participant responds, "I don't know" or "I don't know how to do that." - The participant has clearly stated he/she does not know the answer and thus no further clarification is needed. Score the item as Incorrect/Don't Know (e.g., on the MMSE).

   2. If a participant responds, "I don't know. I don't want to do that." – The participant reports both not knowing and not wanting to do the task. Because the participant first stated, "I don't know," score the item as Incorrect/Don't Know.

   3. If a participant responds, "I don't want to do that; I never could do that kind of thing." - The examiner should prompt, "Will you give it a try?" or "Would you give me your best guess?" If the participant declines to answer, score the item as Not Attempted/Refusal (e.g., on the MMSE).

   4. Scoring can be subjective. In cases where a judgment must be made, record the participant's verbatim response and score after the testing session. Examiners may want to consult with another psychometrist at their site or may contact Tiffany Owens (taowens@umc.edu) or Dr. Tom Mosley (tmosley@umc.edu) at the Jackson Field Center to discuss an item or question.

V. If a participant asks what the NCS battery or a specific test is measuring, you can say something like "A lot of these tests measure things that may change with age like thinking and functioning." Please do not explain what a test is measuring, as this can affect the results.

IV. DETAILED INSTRUCTIONS FOR EACH TEST

A. INTRODUCTORY TELEPHONE SCRIPT

Examiner's Phone (NCST0c): ☐ Cellphone ☐ Landline ☐ VOIP/PC

   1. INTRODUCTORY SCRIPT

"Hello, this is _____ calling for the ARIC Study. I would like to speak to Mr./Ms. _____."

"Mr./Ms. _____, this is _____ calling for the ARIC Study. How are you today? Thank you for agreeing to participate in the phone interview."

"The call will take about 45-60 minutes. Is this still a good time for you?"

☐ No *(If no, reschedule)*
☐ Yes *(continue)*

If Yes, say: **"Great. On the call today, I will ask you some questions and ask you to try some tasks that require memory and concentration. You will be familiar with some of these, because they're very similar to tasks you've done at the ARIC clinic visits. I will also ask you some questions about your day-to-day functioning and mood.**

Again, the call should take about 45-60 minutes. If you get tired, just let me know and we can take a break or finish the call at another time. If for some reason we are disconnected during the call, I will call you right back."

For participating in the call today, you will be reimbursed $<mark>INSERT FIELD CENTER SPECIFIC CONTENT</mark> for your time."

<mark>INSERT FIELD CENTER SPECIFIC CONTENT AS NEEDED FOR CONSENT HERE</mark>

2. ESTABLISHING HEARING

   "First, let's make sure you can hear me okay. May I ask, if you are you using a cell phone or landline for the call today?" (NCST0d)   ☐ Cellphone
   ☐ Landline
   ☐ Caption

   (If using a landline) **"Is this a "caption" phone (i.e., a phone that shows on a screen what I am saying)?"**
   ☐ Yes   (If yes: **"Is there a different, non-caption, phone you can use?"** *and modify type of phone, if other than landline, above.*)   ☐ Yes
   ☐ No   ☐ No (*If no; ask if the ppt is able to cover the screen for the duration of the interview*)

   (If using a cellphone) **"Is your cell phone charged?"**
   ☐ Yes
   ☐ No   (*If no:* **"Are you able to plug it in and still talk on the phone?"**)
   ☐ Yes
   ☐ No   (*If no, may need to reschedule*)

   "Do you feel you can hear me fairly well?"
   ☐ Yes
   ☐ No

   "Do you use a hearing device?"
   ☐ Yes   (*If yes:* **"Is it in place?"** ☐ Yes   ☐ No)
   ☐ No   (*If no:* **"Would you please put it on?"** ☐ Yes ☐ No)

   "Now, let's try a quick task to make sure you can hear me okay." *(Collect the ESUT on paper)*

   INSERT PAPER VERSION OF ESUT HERE IN THE PACKET

   Instruction: Proceed with the rest of the introductory script below if the ESUT indicates the PPT hears well enough to collect the neurocognitive battery.

3. PARTICIPANT'S ENVIRONMENT
   "Before we get started, I need to ask you just a few more questions. For the remainder of the call, it will be important that you are in a quiet space and free from distractions so you can concentrate."

"Are you in a quiet place where you will not be disturbed?" ☐ Yes ☐ No

"Do you have pets that need to be taken care of before we begin?" ☐ Yes ☐ No

"Other than the phone you are using, do you have a cell phone, TV, radio or computer turned on in front of you?" ☐ Yes *(If yes:* **"I will need to ask you to turn them off."**)
☐ No

"Do you have anyone nearby?" ☐ Yes *(If yes:* **"Please ask them to move to another room because we do not want you to be distracted during the interview."**)
☐ No

"Do you need to use the bathroom or get a drink of water?" ☐ Yes ☐ No

4. <u>GROUND RULES</u>
"For each of the tasks we do today, I will ask you not to write anything down or get help from anyone else. Each of the tasks I will ask you to do today must be done in your head."
"Do you have any pencils, pens or paper in front of you now?"
☐ Yes *(If yes:* **"I will need you to remove them."**)
☐ No

"Do you have any calendars, or newspapers in sight or a watch with a date feature?"
☐ Yes *(If yes:* **"I will need you to put them out of sight for me. Thank you."**)
☐ No

"Great, I believe we are ready to get started."

Instruction: Proceed with the question about recording the interview <u>IF</u> you intend to record. Otherwise, go to the next test in the battery.

5. <u>RECORDING</u>
"At this time, I would like to know if it is okay to record this interview? The recording will help me to more accurately capture your answers and to ensure that we are conducting the interview in the correct way. The recording will be discarded once a review is completed. May I record the interview?"
☐ Yes
☐ No

B. ENSURING SPEECH UNDERSTANDING (ESUT)
1. <u>Administration for Trial 1</u>
   a) <u>The ESUT form should be administered in the middle of the Introductory Script Document, after asking about hearing devices.</u>
   b) Background noise should be minimized.
   c) Participant should use any sensory aids they would normally use.
   d) Introduce the test: "**Listen carefully, because I am going to read you several sentences. After I read each sentence, please repeat it back to me.**"

e) If the participant understands the instructions, say: **"The first sentence is…"**

f) Read each sentence from Trial 1 slowly, about 3 seconds articulating clearly with normal inflections. No repetitions are allowed.

g) If the participant does not understand the instructions, repeat the instructions for Trial 1.

h) It is important that pace and volume be maintained throughout Trial 1 regardless of how the participant's performance.

2. Scoring
   a) Circle and sum the WORDS IN ALL CAPS (excluding 'A') that are repeated correctly.
   b) If total score for Trial 1 ≥ 13 STOP ESU and proceed with neurocognitive testing per protocol.
   c) If total score for Trial 1 <13, proceed with Trial 2 and a) use a slightly louder tone voice, and b) if the ppt is using a cell phone, check to see if the volume can be increased and if they can hold the speaker closer to their ear.

3. Administration for Trial 2
   a) Read each sentence from Trial 2 slowly, about 3 seconds articulating clearly with normal inflections. No repetitions are allowed.
   b) Examiner should read sentences at the same pace but in a slightly louder (and lower tone of) voice. Pace and volume should be maintained throughout Trial 2.

4. Scoring
   a) Circle and sum the WORDS IN ALL CAPS (excluding 'A') that are repeated correctly.
   b) Regardless of score for Trial 2, if based on your interactions up to this point some reasonable communication seems possible, proceed with the testing and discontinue due to hearing loss (or other applicable reason) as needed. Speak as loudly and as distinctly as possible. If, in the examiner's judgement, communication is so severely limited such that all tests would likely be discontinued due to hearing loss or would produce severely biased cognitive test results, then the call may be ended at this point. Say: "**Thank you very much Mr./Mrs. _____ , but you may not be able to hear me well enough to complete the memory and thinking tasks over the phone, so I will not continue at this time. On behalf of the ARIC study, thank you for taking time to speak with me today.**"

C. **MINI-MENTAL STATE EXAM (MMSE) & CDP (Item #s 15-19) HYBRID (MCHT)**
   1. Administration
      a) This form is a hybrid of the MME form and the CDP form. MME 0c-8 have remained the same, and 9-10 have been adjusted for phone administration. MME 11-30 have been dropped, and CDP 15-19 have been added.
      b) Introduce the cognitive testing portion of the exam. Say, **"In this next part, I will ask you some questions that will require memory and concentration. Some may seem a little easier than others."**

   2. Blessed Test Items (Questions 0c-0f)
      a) These items have been added to the MME form for efficiency.
      b) Read each question and record responses. One point is given for each correct response.
      c) If unsure whether a response is correct or not, record the participant's response on the scoring sheet and seek clarification after the testing session.
      d) Q0c. First and last name is sufficient for "full name" to be correct.
      e) Q0e. If the ppt gives only the last two digits of their birth year, prompt by saying **"What is the full year (for your date of birth)?"**
      f) For this question and the ones following, if PPT is on a cellphone, ask them to turn their

phone over during the questions. Q0f. The participant must be within one hour for the "time of day" to be correct.

3. <u>Orientation to Time</u> (Questions 1-5)
   a) Read each question and record responses. One point is given for each correct response.
   b) If unsure whether a response is correct or not, record the participant's response on the scoring sheet and seek clarification after the testing session.
   c) If the participant gives only the last two digits of the year, prompt by saying, "**What is the full year?"**
   d) Some leeway is allowed for the correct response to season:
      (1) Winter: December, January, February, March
      (2) Spring: March, April, May, June
      (3) Summer: June, July, August, September
      (4) Fall/Autumn: September, October, November, December
   e) If the month has just changed (or is about to change), it is correct to say either month (i.e., it is within one "day" of the correct month).
   f) If the participant gives the date when prompted for the day, give credit for date (item 5) if the response is correct, and say: "**Good, and what day of the week is it?"**

4. <u>Orientation to Place</u> (Questions 6-10)
   a) Read each question and record response. One point is given for each correct response.
   b) Q9. If the ppt gives their full (and accurate) street address, give credit for #10 and skip to item 11

5. <u>CDP Items 15-19 (Questions 11-15 on this hybrid form)</u>
   a) Introduce Q11. Say **"Now, I'm going to ask you how two things are alike. For example, if I asked you how a pen and a pencil were alike, you might say they both write. Please tell me how a _____ and a _____ are alike?"**
   b) Introduce Q12. Say **"Now, I'm going to ask you how two things are different. For example, if I asked you how sugar and vinegar were different, you might say one is sweet and one is sour. Please tell me how a _____ and a _____ are different?"**
   c) If the initial response by the participant doesn't merit a score of 0, prompt 1 time to identify the ppt's best understanding. Say **"Tell me more"** or **"Can you tell me another way they're alike (different)?"**
   d) Q13-15. These are calculation items that the ppt must figure in their head. Using paper and pencil is not allowed. On item 15, the ppt may be prompted 1 time to **"Keep going"** if they stop before reaching 2.

6. <u>Scoring</u>
   a) <u>CDART will calculate the MMSE/CDP hybrid total score</u>.
   b) Items that are not attempted/refused due to any reason <u>other than cognitive impairment</u> (e.g., aphasia or hearing problems) are marked as "not attempted/refused" on paper and are set to missing in CDART. (Similarities/Differences/Calculation items are left blank/noted as not attempted on the paper form and set to missing in CDART)

D. CERAD IMMEDIATE RECALL
   1. <u>Administration</u>
      a) To introduce this task and Trial 1, say: **"On this next task, I will ask you to try to remember a list of 10 words. I will read the list of words to you 3 times, and each time, after I have**

finished, I will ask you to tell me as many of the words as you can remember. It doesn't matter in what order you say them, just tell me as many as you can. Are you ready? Now, please listen closely as I read each word."

b) Read each word slowly (2 seconds per word) and enunciate clearly.

c) After reading all 10 words, say: **"Now, tell me all of the words you can remember."**

d) Record the order in which the participant recalls the words by documenting the serial position of each word recalled within a trial. Allow up to 90 seconds for recall on each trial.

e) For Trial 2, say: **"Great. Now, we are going to try that again. I am going to read to you the same list of 10 words but in a different order, and again when I stop, I want you to tell me as many of the words as you can remember, including any words you may have said the first time. Listen closely as I read each word."**

f) After reading all 10 words, say: **"Now, tell me all of the words you can remember."** (Again, record the order in which the ppt recalls the words.)

g) For Trial 3, say: **"We're going to try that one last time. I am going to read to you the same list of 10 words one more time in a different order. Again, when I stop, I want you to tell me as many of the words as you can remember. A little later in the call, I will ask you to recall these words again. Listen closely as I read each word."**

h) After reading all 10 words, say **"Now, tell me all of the words you can remember."** (Again, record the order in which the ppt recalls the words.)

2. Prompts

   a) After 10-15 seconds of silence (or the ppt indicates they cannot recall anymore words), prompt one time with **"Anything else?"** and then move to next trial (or next subtest if it is Trial 3).

      (1) If they say "**No**" or "**I can't remember anything else**" after prompt is provided, then move on to the next trial or subtest and do not wait the full 90 seconds.

   b) Provide only one prompt for each trial.

   c) Record any response given after the prompt.

3. Scoring

   a) Record the serial position of each word recalled within a trial.

   b) Record the total number of words correctly recalled on each trial.

   c) Intrusions (words not on list, including words that do not sound the same or are not phonemically similar to a word from the list) and Repetitions (words said more than once) are not recorded. Examples of acceptable, phonemically similar words are found in the "CERAD Acceptable Words" document located in the QxQ column for the V8 NCG Telephone Booklet on the ARIC website. Note, these words are acceptable for CERAD immediate and CERAD delayed.

   d) If a participant reports they are unable to hear ≥ 3 or more words in any trial, discontinue the CERAD due to hearing loss (or phone connection, as appropriate). If the immediate recall trials are discontinued, then delayed recall should not be attempted (and the same discontinuation code should be entered for that subtest). If the participant is unable to hear 1-2 words across two or more trials, this should be noted in the section on factors affecting validity.

   e) If CERAD-Immediate is discontinued, then CERAD-Delayed should not be attempted, and the reason for discontinuation code should be the same for both subtests.

E. DIGIT SPAN BACKWARDS

  1. Administration
       a) In this task, the participant is read a list of numbers and asked to repeat them in the reverse order.
       b) Say, **"Now I am going to say some numbers. When I stop, I want you to say them backwards. For example, if I say: 1-2-3, what would you say?"**
       c) If the participant responds correctly (3-2-1), say, **"That's right"** and proceed to item 1.
       d) If the participant fails the practice trial, say, **"No, you would say 3-2-1. I said 1-2-3, so to say those numbers backwards, you would say: 3-2-1."** Proceed to the first item on the form. Say, **"Now try these numbers."**
       e) Read the digits clearly and at a rate of 1 per second. You should say the numbers in a monotone (like a robot), with voice inflection dropping slightly on the last digit. Administer both trials of each item.
       f) From #2 and beyond, introduce sequence each saying, **"Here's another."** Each trial may be presented only once.
       g) The test is discontinued after two consecutive errors of the same length item (i.e., after failing trials A and B of any item set). Note: this is not recorded as a "discontinuation" on the Neurocognitive Scoring Summary Form, because the task was fully attempted and a real score was produced.

  2. Prompts
       a) On the first item (and only the first item), the ppt can be reminded to say the numbers backward. If they say it correctly after this prompt, credit can be given.

  3. Scoring
       a) Record responses verbatim. Score 1 point for each completely correct trial (no partial credit is given). Record the total correct responses at the bottom of the form.
       b) This test may be discontinued due to participant refusal, task difficulty (e.g., the participant never fully understood the instructions), if the examiner determines that the participant is unable to perform the task due to a physical impairment (e.g., severe hearing loss), and multiple other reasons (noted on the NCST form). If discontinued, the reason is recorded on the NCST form.

F. CERAD DELAYED RECALL

  1. Administration
     a) Say, **"A few minutes ago, I read a list of 10 words to you several times. Now I want you to tell me as many of those words as you can remember."**
     b) Record the serial position of each word recalled. Allow up to 90 seconds for recall.

  2. Prompts
     a) After 10-15 seconds of silence (or the ppt indicates they cannot recall anymore words), prompt one time with **"Anything else?"**.
         (1) If they say **"No"** or **"I can't remember anything else"** after the prompt is provided, then move on to the next test and do not wait the full 90 seconds.
     b) Provide only one prompt for more words.

  3. Scoring
     a) Record the serial position of each words recalled.
     b) Record the total number of correctly recalled words.
     c) Intrusions (words not on list, including words that do not sound the same or are not phonemically similar to a word from the list) and Repetitions (words said more than once) are

not recorded. Examples of acceptable, phonemically similar words are found in the "CERAD Acceptable Words" document located in the QxQ column for the V8 NCG Telephone Booklet on the ARIC website. Note, these words are acceptable for CERAD immediate and CERAD delayed.

    d) If CERAD-Immediate was discontinued, then the delayed subtest is not administered (and the discontinue code used for Immediate would be the same one used for Delayed).

G. ORAL TRAILS A

  1. Administration

    a) Say, **"Ok, now we'll try something a little different. I'd like you to count from 1 to 25 as quickly as you can. Just like this: 1, 2, 3, 4, and so on. Ready? Go ahead."** Start timing immediately after saying **"Go ahead".**

    b) If the participant makes an error, mark an X in the box below the first number where the error occurred. Immediately correct the error and move to the next attempt to continue.

    c) If the participant clearly does not comprehend the task, do not administer Oral Trails B (code both Oral Trails A & B as not attempted due to task difficulty).

    d) At the end, say, **"That's fine,"** or **"very good."**

    e) The test is stopped if the participant makes 5 errors (if the participant self-corrects an error do not count it as an error) or exceeds 4 minutes and time and errors are recorded. Note: In this case, this is **not** recorded as discontinued due to refusal, task difficulty or impairment.

  2. Prompts

    a) Call all errors to the ppt's attention immediately and have the ppt continue with the series from the last correct number. For example, if the ppt said "13, 14, 16" then say, **"I'm sorry; that was incorrect. Please start at 14 and continue."** Do not stop timing during corrections.

    b) If the ppt stops for 5 or more seconds before reaching 25, prompt with **"Please keep going."** If the participant doesn't recall where they are in counting, provide the last correct response (e.g., **"Please start at 14 and continue."**) and score as an error. After a further delay of 15 or more seconds, discontinue and code as not attempted due to task difficulty. (I.e., after providing the last correct response to the ppt, if they do not respond within approx. 15 seconds, the examiner may discontinue the task due to task difficulty.) Up to 5 attempts are allowed for this task.

    c) If the ppt starts over at 1 (or a different number than what was prompted) after an error correction, the examiner should remind the ppt 1x with **"Start at (#), please"**. If the ppt continues to start at a different # than what they are told, let them continue. But, any errors made on subsequent attempts would not be counted if they occurred before the point where the ppt made their initial error. For example, if a ppt said "1, 2, 3, 4, 5, 6, 8" the examiner would correct the error and ask the ppt to start at 6 and continue. The ppt starts over at 1, so the examiner reminds with "Start at 6, please". The ppt still says "1, 2, 3, 5" and the examiner would error correct and have them start at 3, but the error at 4 would not be counted, since the ppt correctly said that before making their first error at 7.

  3. Scoring

    a) Draw a horizontal line through boxes below numbers that the participant says correctly. Draw an X in boxes below numbers where an error occurred.

    b) Record the time to completion, the total number correct, and the number of errors at the bottom of the form and on the Neurocognitive Scoring Summary Form.

        (1) If the participant makes 5 errors, then the errors should be recorded as 5 and the time should be recorded as 4 minutes 0 seconds, no matter how long it took the participant to make 5 errors.

(2) If the participant exceeds 4 minutes, the test is stopped and the time is recorded as 4 minutes 0 seconds. Errors are recorded as the actual # of errors the participant made in that 4 minutes.

(3) The total number correct is independent of number of errors. For example, a ppt will always have a score of 25 correct if they complete the entire sequence in the time allowed, even if errors were made. (I.e., each box with a horizontal line in it is summed and equals the total number correct score.)

c) This test may be discontinued due to participant refusal, task difficulty (e.g., the participant never fully understood the instructions), if the examiner determines that the participant is unable to perform the task due to a physical impairment (e.g., hearing loss), and multiple other reasons. If discontinued, record this on the NCST form.

H. ORAL TRAILS B

1. Administration

a) Say, **"Now, I'd like you to alternate between numbers and letters when you count. So, you would say the number 1, and then say the letter A, then number 2, then letter B, and so on. Let's do a practice trial first. Please count to the number 4, alternating between numbers and letters. Ready? Go ahead."**

b) If the participant makes an error, make an X in the box below the #/letter where the error was made and say, **"I'm sorry, that was not quite correct. It should be 1, A, 2, B, 3, C, 4. Let's try it again."**

c) Up to three practice trials are given. Repeat instructions with guidance only twice.

d) If the participant cannot complete the sample and clearly does not comprehend the task, do not administer Test B (code as not attempted due to task difficulty).

e) If performance is correct, proceed to Test B.

f) Say, **"Good. Now, I want you to do that same thing, but with more numbers and letters. Just like before, you'll say 1, A, 2, B, 3, C, 4; but this time, keep going until you reach the number 13. Ready? Go ahead."**

g) Start timing immediately after saying **"Go ahead".**

h) At the end, say, **"That's fine,"** or, **"very good."**

i) The test is stopped if the participant makes 5 errors (if the participant self-corrects an error do not count it as an error) or exceeds 4 minutes and time and errors are recorded. Note: In this case, this is not recorded as discontinued due to refusal, task difficulty or impairment.

2. Prompts

a) Call all errors to the participant's attention immediately (make an X in the box below the number/letter where the error occurred) and move to the next attempt. Have the participant proceed from the point the mistake occurred. Say, for example, **"I'm sorry; that was incorrect. Please start at (number-letter pair) and continue."** Do not stop timing.

b) You can remind the participant by saying **"Number-Letter"** to keep them on task.

c) If the participant stops for 5 or more seconds before reaching 13, prompt with **"Please keep going."** If the participant doesn't recall where they are, provide the last correct number-letter pair (e.g., **"Please start at 3-C and continue.")** and score as an error. After a further delay of 15 or more seconds, discontinue and code as not attempted due to task difficulty. (I.e., after providing the last correct number-letter pair to the ppt, if they do not respond within approx. 15 seconds, the examiner may discontinue the task due to task difficulty.) Up to 5 attempts are allowed for this task.

d) If the ppt starts over at 1 (or a different number/letter than what was prompted) after an error correction, the examiner should remind the ppt 1x with "Start at (#-letter pair), please".

If the ppt continues to start at a different #-letter pair than what they are told, let them continue. But, any errors made on subsequent attempts would not be counted if they occurred before the point where the ppt made their initial error. For example, if a ppt said "1, A, 2 B, 3, C, 4, E" the examiner would correct the error and ask the ppt to start at C-4 and continue. The ppt starts over at 1, so the examiner reminds with "Start at 3-C, please". The ppt still says "1, A, 2, B, C" and the examiner would error correct and have them start at 2-B, but the error at 3 would not be counted, since the ppt correctly said that before making their first error at D.

3. Scoring
   a) Draw a horizontal line through boxes under #/letters the participant says in correct order. Draw an X in the box under the #/letter where an error was made.
   b) Record the time to completion, the total number correct, and the number of errors at the bottom of the form and enter in the DMS Neurocognitive Scoring Summary Form.
      (1) If the participant makes 5 errors, then the errors should be recorded as 5 and the time should be recorded as 4 minutes 0 seconds, no matter how long it took the participant to make 5 errors.

      (2) However, if the participant exceeds 4 minutes, the test is stopped and the time is recorded as 4 minutes 0 seconds. Errors are recorded as the actual # of errors the participant made in that 4 minutes.

      (3) The total number correct is independent of number of errors. For example, a ppt will always have a score of 25 correct if they complete the entire sequence in the time allowed, even if errors were made. (I.e., each box with a horizontal line in it is summed and equals the total number correct score.)
   c) This test may be discontinued due to participant refusal, task difficulty (e.g., the participant never fully understood the instructions), if the examiner determines that the participant is unable to perform the task due to a physical impairment (e.g., hearing loss), and multiple other reasons. If discontinued, record on the NCST form.

I. WORD FLUENCY
  1. Administration
   a) In this task, participants are asked to produce as many words as possible that begin with the letters F and A within a time limit of 60 seconds for each letter, avoiding proper nouns, variations, plurals, and repetitions.
   b) Explain the task to the participant. Say:
      "On this next task, I will say a letter. Then I want you to tell me as many different words as you can think of, as fast as you can, that begin with that letter.
      Leave out names of people, names of places, and numbers. So, if I were to say 'T,' you should not say words like 'Thomas,' 'Texas,' or the number 'Ten.' But you could say words like 'table,' 'take,' or 'turtle.'

      Also, do not use the same word again with a different ending. For example, if you said 'take,' then you should not say 'takes,' or 'taking.' These would all be considered the same word. Now I want you to tell me as many words as you can think of that start with the letter F. Can you say that letter back to me? *(If ppt repeats "F" proceed with task. If they say any other letter, repeat the instruction again. After the 2nd failed attempt, say* **"F as in fire"** *and confirm the ppt heard "F". If they still cannot understand, discontinue the task due to the appropriate reason, such as hearing loss or bad phone reception.)* **Ok good. I will tell you when to stop. Are you ready? Go."**

c) Start the stopwatch after saying "Go" and record the participant's responses verbatim.

d) Record all words produced (use the back of the page if more space is needed).

e) Do not stop the test until the entire 60 seconds is over.

f) After 60 seconds has passed, the examiner stops the test, provides encouragement, and states the next letter. Say, **"Stop. Thank you. Now, tell me as many words as you can think of that start with the letter A. Can you say that letter back to me?** *(If ppt repeats "A" proceed with task. If they say any other letter, repeat the instruction again. After the 2nd failed attempt, say* **"A as in apple"** *and confirm the ppt heard "A". If they still cannot understand, discontinue the task due to the appropriate reason, such as hearing loss or bad phone reception.)* **Ok good. I will tell you when to stop. Are you ready? Go."**

g) Start the stopwatch after saying "Go" and record the participant's responses verbatim.

h) After 60 seconds has passed, the examiner stops the test.

2. <u>Prompts</u>

a) If the participant cannot think of any more words, wait quietly for ~ 10 seconds. After 10 seconds of silence prompt for more words, saying, "**Can you think of any other words that that begin with the letter __?"**

b) A participant may stop producing words because he/she feels he/she made an error (e.g., repeated a word or said a proper name). In this instance, prompt the participant to continue, saying, "**That's okay; just go on."**

c) If a participant asks if they already said a word, do not say "yes" or "no". Instead, encourage more responses by saying, **"It's ok; keep going!"** or **"You can repeat words."**

d) The examiner should never interrupt the exam to correct sporadic errors. However, if the participant has clearly lost focus or clearly misunderstood the instructions (e.g., begins naming only inadmissible words, such as numbers, or begins to name only variants of a previous word, such as "flower" followed by "rose," "daisy" etc.), clarify the instructions after three or more consecutive errors**: "Tell me words that start with F (or A) but do not include numbers"** (or people, etc. depending on the error).

3. <u>Scoring</u>

a) While recording the words, if the examiner cannot keep up with the words produced and misses a word, but is certain that the participant produced an admissible word, place an "X" on

the line or write part of the word to indicate the participant should receive credit for the word. Please also make a note next to those entries (e.g., "ok", "admissible", "credit given" so that scoring is clear). If you have trouble clearly hearing a word that the ppt says, but are fairly certain it was an admissible word, credit can be given. Review recording to clarify words said during this task.

b) Place a single strike mark through inadmissible words, i.e., proper nouns (names or places), simple variations (adding "ed" or "ly"); plurals or repetitions should only be counted once. Record the number of admissible words for each letter at the bottom of the form.

c) After the participant has left the room, the examiner must proof all the responses for admissibility. The examiner should finish writing out any words that were not completely written out during the exam. Clarify any words that may have been unclear during the time the test was given. If unable to spell the word, write it out phonetically. Check any ambiguous words in the dictionary (only after the participant has left the room).

d) Some admissible and inadmissible words are included here:

(1) <u>Admissible:</u> felt/feelings, free/freedom, fall/fell, season/seasoning, anxious/anxiety,

stand/stood, foot/feet, anonymous/anonymity, sun/sunshine, fuse/fusion, sea/seashore, frank (adj), ford (n), French (adj), & august (adj).
  - (2) <u>Inadmissible:</u> fool/foolish, final/finalize, success/successful, fun/funny, fight/fought, sit/sat, say/said, freeze/froze, friend/friendly, & sun/sunny.
  - (3) Words like "anyone, anything, and anybody" are counted as separate words. If a word is capitalized (e.g., Santa), it is a proper noun and would not count. Homonyms like "ant" and "aunt" may be counted if given consecutively; otherwise, it is considered a repetition and only counted as one word.
  - (4) Homophones (i.e., words that sound like they are spelled with F, A or S but actually begin with another letter) are inadmissible.
  - (5) Do not give credit for words that the participant says inadvertently (e.g., "I can't think of <u>any</u> more words." Do not give the participant credit for "any" under the letter A).
  - (6) Words from other languages (e.g., apropos) are also counted. However, it is up to the examiner to verify the word in cases where the examiner is not familiar with a given word.
  - (7) If the ppt is given the script "F as in fire" or "A as in apple" and later says "fire" or "apple," during the timed task, these words are counted as correct.
- e) Word Fluency may be discontinued due to participant refusal, task difficulty (meaning the participant never understood the instructions), physical impairment (e.g., severe hearing loss), or various other reasons. If discontinued, the reason is recorded on the NCST form.

J. ANIMAL NAMING
  1. <u>Administration</u>
  - a) In this task, the participant is asked to name as many different animals as he/she can think of in 60 seconds.
  - b) Say, **"Now we'll try something different. On this task, I want you to tell me as many different animals as you can think of. Name them as quickly as you can. I will tell you when to stop. Ready? Go ahead."**
  - c) Start timing after saying **"Go ahead"**. Allow 60 seconds.
  - d) Write down all of the words verbatim in the order in which they were produced. The examiner may also indicate that an acceptable word was produced by simply making an "X" on the form or write part of the word if production is too rapid for verbatim recording. Verbatim words are preferred however. Review recording to clarify names said during this task.

  2. <u>Prompts</u>
  - a) If there is a pause of 10 seconds or more, repeat basic instructions and give the starting word **"dog"**.
  - b) If the participant discontinues before the end of the time period, encourage him/her to try to think of more names.
  - c) Prompt participant not to provide given names after 3 consecutive occurrences.

  3. <u>Scoring</u>
  - a) After the phone call has ended, the examiner totals the valid responses. Credit would be given for prompt 2a ("dog" noted above) if participant verbalized "dog" back.
  - b) Place a single strike mark through repetitions and plurals, these should only be counted once.
  - c) Names of extinct, imaginary, or magical animals are admissible (e.g., dragon). Given names for animals like "Fido" or "Spot" are not counted. Credit is given for: "human/homosapien", breeds (e.g., terriers); male, female, infant names of a species (e.g., bull, cow, calf); both

superordinate and subordinate examples of a species (e.g., both dog and terrier are credited); birds; fish; reptiles; and insects.

    d) Record the number of admissible animals at the bottom of the form.

    e) Animal Naming may be discontinued, e.g., due to participant refusal, task difficulty (meaning the participant never understood the instructions), physical impairment (e.g., severe hearing loss), or various other reasons. If discontinued, the reason is entered on the NCST form.

K. OPTIONAL BREAK

1. There is an optional break offered to the participant after Animal Naming, before the CEST is administered. If the ppt would like to take a short (5-10 minute) break, allow them to do so. If the ppt indicates they would like to stop and finish the battery at a later time, please schedule a 2nd call at the ppt's preferred date/time to finish the CEST and CDP forms.

    a) The time frame between the first and second call should be as short as possible, but no more than 1 month.

L. CEST

1. <u>Administration</u>

    a) Say **"These next questions are about how you might have felt or behaved recently. For each question, please tell me how often you felt this way during <u>the past week</u>."**

    b) Read each item to the participant, including answer/response options.

2. <u>Prompts</u>

    a) The interviewer may re-read the answer options if the participant has problems recalling them or choosing a category.

    b) When asking these questions, interviewers should be careful to not comment on respondent's answers and to record answers in a non- judgmental manner.

3. <u>Scoring</u>

    a) Mark each item according to the frequency indicated by the participant.

4. <u>Procedures if Participants Report Depressive Symptoms Beyond Those Addressed in the CEST Questionnaire (Off-the-Record) or Report Suicidal Thoughts:</u>

    a) During administration of measures of depressive symptom, it is not uncommon for participants to reveal additional symptoms of depression. Participants who acknowledge significant depression should be advised to see their physician (psychiatrist or psychologist if they have one) within 48 hours so that an appropriate referral can be made. Participants who acknowledge suicidal thoughts to interviewers should be referred immediately to the emergency room of the nearest hospital. If a participant refuses to go to the emergency room, he/she should be strongly encouraged to seek care as soon as possible. If a participant expresses intent and/or a specific plan, staff will call 911 for assistance to transport the participant to an ER.

M. CDPT (REMAINING ITEMS-#1-14, 20-25, & 27)

1. <u>Administration</u>

    a) Introduce the CDPT: **"Next, I would like to ask you about your memory and day-to-day functioning over the past year."** Emphasize to the participant that we are interested in functioning compared to the past—for example, 10 years ago.

    b) For each item, questions are read and responses given; the examiner may need to listen

carefully to the responses, since many participants may answer with more elaborate responses than a simple yes/no; this additional information may be helpful in determining an overall CDR domain score.

c) The informant part of the CDR (CDI; QXQ provided separately) is most important in determining the total CDR summary score (CDS form), but self-reported forgetfulness and problems in daily functioning that are determined through the CDP interview will be helpful in making the final scoring determinations for the CDR. Thus, it is helpful although not required that the CDP and CDI be administered by the same staff member.

d) Q24-25. (Home and Hobbies questions) If the participant states that there is a change in any of these activities but only for physical reasons (such as arthritis, limited mobility, etc) these should <u>not</u> be scored as a "1" (some change).

2. <u>Prompts</u>

a) The examiner should prompt for change (**"Is this a change for you?"**) and cause of change (**"What do you think caused this change?"**) as appropriate.

3. <u>Scoring</u>

a) Mark items as a change if, <u>and only if</u>, prompting for change and cause of change (if necessary) has been completed and indicates the participant has experienced a change due to memory or thinking problems.

N.   NEUROCOGNITIVE BATTERY SUMMARY FORM (NCST)

1. All tests are scored and the Neurocognitive Battery Summary Form completed after the participant has completed the cognitive tests and the phone call has been concluded. (The ESUT, MCHT, CDPT, and CEST forms are all completed separately in CDART.)

2. Please document the type of device used for the interviewer and the participant. (Cell phone, Landline, or VOIP/PC) *Note* Jabber is an example of VOIP.

3. There are some occasions when a particular test will not be performed. The reasons may include:
   a) A = Refusal (participant declines/refuses to perform a test)
   b) B = Task difficulty (participant could not fully understand the instructions or became frustrated)
   c) C = Physical impairment (Hearing loss or aphasia)
   d) D = Telephone connection (poor quality, dropped calls, echo, etc.)
   e) E = Distractions (background noise like TV, radio, other voices, etc.)
   f) F = Interruptions (people, pets, kids, etc.)
   g) G = Inappropriate aid (clocks, calendars, writing down answers, help from others)
   h) H = Participant became fatigued
   i) I = Other (note in notelog)

4. If a test is not performed or discontinued for one of these reasons, the reason is recorded on the Neurocognitive Battery Summary Form.

5. Note that some tests (e.g., Trails A & B) have specific criteria for when the test should be stopped. If the test was stopped because the participant met the test's criteria (e.g., exceed time on Trails, etc.) to stop, select 'No' as the response to 'was the test discontinued,' and enter the score (rather than one of the 'A, B, C, etc…' reasons for discontinuation).

6. <u>For Questions 1-8:</u> Subtest scores may be directly entered into CDART from the test booklet pages. Complete test discontinuations and discontinuation codes for tests, as applicable.

7. <u>For Question 9:</u> The examiner is asked to comment on whether they feel that the tests <u>that were completed</u> provide a reasonably accurate indication of the participant's cognitive ability. Select "no" if there were any mitigating factors that the examiner felt may have adversely affected the participant's performance. This would not include tests that were discontinued

(as the reasons for these issues will have already been noted). Examples that may have affected performance would include: hearing loss, phone issues, frequent interruptions, etc…

    a) <u>For Questions 9a-9h</u>: If 9 is answered "no", then the examiner is asked to comment on each subtest as to whether or not that subtest's results reflect the participant's cognitive function, in the examiner's opinion. For those subtests that the examiner feels the results do not reflect the participant's cognitive function, the examiner is then asked to describe the type of interference (from the "Factors Affecting Validity" list). The examiner may also enter comments to provide more information.

8. Factors Affecting Validity List
   a) A = Hearing loss
   b) B= Telephone connection (poor quality, dropped calls, echo, etc.)
   c) C = Distractions (background noise like TV, radio, other voices, etc.)
   d) D = Interruptions (people, pets, kids, etc.)
   e) E = Suspected inappropriate aid (clocks, calendars, writing down answers, help from others)
   f) F = Participant became fatigued
   g) G = Lack of effort or disinterest
   h) H = Emotional issues
   i) I = Other (note in notelog)

O. CERTIFICATION AND QUALITY CONTROL

1. <u>Certification</u>
   a) For examiners that are currently certified on ESU, MME, NCS, CDP, NHX, CDI, NPI, and CDS forms, the process for certification is:
      (1) Study Phone Battery manual/QxQ and review all forms.
      (2) Attend central training (or review recorded training call on ARIC website, if unable to attend central training).
      (3) Practice/role-play until proficient with battery administration and scoring.
      (4) Record 3 complete telephone batteries and upload only the 3rd recorded audio and PDFs to ARIC website.
      (5) All 3 recordings will be reviewed by the local trainer.
      (6) The 3rd recording will also be reviewed centrally and, in coordination/consensus with the local trainer, certification determined.
   b) For examiners that are NOT currently certified on CDP, NHX, CDI, NPI, and CDS forms, the process for certification is:
      (1) Complete CDR online training and certification at www.adrc.wustl.edu and email completion certificate to Tiffany Owens at taowens@umc.edu.
      (2) Review ARIC manual, CDP, NHX, CDI, NPI, and CDS forms & QxQs, and CDR training document.
      (3) Practice/role-play until proficient with CDR administration and scoring.
      (4) Record 3 CDR batteries to include the CDP, NHX, CDI, NPI, and CDS forms, and upload the 3rd recording and PDFs to ARIC website.
      (5) All 3 will be reviewed by the local trainer.
      (6) The 3rd uploaded recording will also be reviewed centrally and, in coordination/consensus with the local trainer, certification determined.
      (7) After CDR certification is established, the examiner would begin the Phone Battery Certification process outlined in Section O.1.a above.
      (8) *NOTE* Examiners who have already started CDR certification via the central training protocol should continue with that process.

2. Quality Control

For ARIC:

	For examiners that have at least 3-6 months experience with administering the ARIC/ACHIEVE in-clinic NCG Battery:	For examiners that have less than 3 months experience with administering the ARIC/ACHIEVE in-clinic NCG battery:
First 4 weeks of study	1 recording/PDF each week	2 recordings each week
1st week	reviewed locally	reviewed locally
2nd week	reviewed locally and centrally	reviewed locally and centrally
3rd week	reviewed locally	reviewed locally
4th week	reviewed centrally	reviewed centrally
Weeks 5 to 20	1 recording per month	1 recording per month
5th-8th weeks (Month 2)	reviewed locally and centrally	reviewed locally and centrally
9th-12th weeks (Month 3)	reviewed locally	reviewed locally
13th-16th weeks (Month 4)	reviewed locally and centrally	reviewed locally and centrally
17th-20th weeks (Month 5)	reviewed locally	reviewed locally
Remainder of study	1 recording every other month	
21st week to end of telephone data collection*	reviewed locally with random central review oversight	

For ACHIEVE Psychometrists Only:
*Note: Beginning 2/1/2021, each psychometrist will upload 1 ACHIEVE QC recording to be reviewed locally every other month using the established upload schedule. Following a submission, email the local reviewer(s) that an audio recording has been uploaded to the website.

Forsyth local reviewers: Bria Backman, Josh Evans
Jackson local reviewers: Rachel Foster, Tiffany Owens
Minneapolis local reviewers: Sarah Aguilar
Washington County local reviewers: Jackie Bolinger, Amanda Miller

Local reviewers: Please email all QC feedback to Tiffany Owens (taowens@umc.edu). Also, in addition to adding initials and the date to the QC recordings table on the ACHIEVE website following a completed local review, please email arichelp@unc.edu to let the Coordinating Center know when you have completed a review.