	Title:	Neuropsychological Battery DCS	
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1.0 Purpose:
The purpose of this document is to describe the standardized procedure for administering the four tasks of the Neuropsychological Battery which include the Event-based Prospective Memory Test (PMT), Stroop Neuropsychological Screening Test, Controlled Oral Word Association Test (FAS), and Choice Reaction Time Test (CRT) and Social Network Questionnaire.

2.0 Scope:
DCS staff will use this document when administering the Neuropsychological Battery to participants.

3.0 Responsibilities:
DCS staff are responsible for performing the procedures as described in the current and approved version of the standard operating procedure.

4.0 Related Documents:
- Neuropsychological Battery Questionnaire

- **SOP_DCS_0020** – Hearing SOP

- **MAN_DCS_0237** – CLSA Comprehensive - Cognition Administration Guidance Manual

- **Cognition_FINAL_2015Feb27.ppt** – Cognition Training Presentation

5.0 Definitions:
- **Intention to Perform:** the degree to which the signal (i.e., the alarm going off) elicits a self-initiated response from the participant.

- **Accuracy of Response:** the degree to which the target action is performed as originally instructed. It is scored based on the correspondence between object (i.e. what bill denominations to select) and participant (i.e. which person gets which denomination).

- **Need of Reminders:** the number of reminders (up to three) needed by the participant to initiate or complete the task.

6.0 Equipment:
- External headset with a microphone

7.0 Supplies:
- Envelope containing money;

- VWR Traceable Alarm Timer/Stopwatch;

- Event-based PMT reference sheet; and,

- Stroop stimulus cards (set of 3) – **DO NOT LAMINATE**

8.0 Procedure Steps:
Contraindications:

- **The timer once started should not be stopped** (unless otherwise stated in this SOP) before the end of the allotted time. If the timer is stopped early without cause the data will not be scored.
    - o If a participant asks to move onto the next task or end the timer please use the phrasing, *"as soon as the system allows me to, we can move to the next task".*

- Participant has a severe or complete visual impairment (event-based PMT, Stroop, Choice Reaction Time).

Administer the tasks in the order in which they appear in this document. **Note that you will be required to move back and forth between the different stages described in this SOP.** Precise adherence to time limits and standardized instructions is critical.

Pausing a Stage:
There are many places throughout this SOP which direct the user to pause a stage. To pause a stage in Onyx:

Step 1: Click on **Administration.**

Step 2: Click **Pause.**

Step 3: Enter your password and choose the reason - *Interviewers Decision* if required.

Step 4: Enter the comment *paused.*

Step 5: Click **Continue**.

Recording a Participant:
Anytime you record a participant's response in Onyx, follow the steps as outlined below.

Step 1: Click on the "O" radial button before the timer.

Step 2: Click on the "🔴 **Record**" button to begin recording the participant (this will also start the timer). Watch the computer monitor to ensure the participant's voice is being picked up on the recording. You will see the sound waves fluctuating as the participant talks.

Step 3: Watch the time and inform the participant when the time has elapsed.

   NOTE: A beep will sound in the participant's headphones.

Step 4: Timer instructions: The timer will count up. The timer should not be reset or paused.
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   DO NOT stop and re-record a participant's response unless the participant's voice is not being recorded. To check that the participant is being recorded, make sure you see the sound wave on the screen (see picture below). If there is no sound wave, turn the volume up. If that still does not produce a sound wave, stop the recording and the participant. Verify that the headphones/mic is plugged in, and that the computer is not muted. Then start the test again. If there is still no sound wave, skip the test.

117 seconds remaining.

Task 1 – Event-based PMT (with 30 minute delay)

DO NOT administer this test if a participant is unable to identify the money due to a severe or complete visual impairment.

Step 1: **At the Interview Tab in Onyx locate the Event PMT stage,** click start on that row.

Step 2: Scan the interview ID and click **Continue**.

Step 3: Select the language and click **Next**.

Step 4: Using the instructions in Onyx:
- Explain and demonstrate the task to the participant;

- Repeat the instructions;

- Verify that participant can hear the timer without difficulty;

- Have the participant repeat the instructions; and,

- Clarify any issues that the participant has.

Step 5: In Onyx answer if the participant is able to do the test and click **Next**.

NOTE: If the participant is unable to do the test, the Event PMT stage will come to an end, proceed to **Step 9:**.

Step 6: Place the envelope to the left or right of participant according to the participant's hand preference and work surface so that the envelope is within the participant's reach but out of the way when working on other tasks.

Step 7: Set the timer for exactly 30 minutes.
- Do not allow participant to see the interval of time selected.

- Place the timer in close proximity to participant.

- Ensure that the participant can't see the time left.

- The face of the timer should be facing the interviewer.

Step 8: **Pause the Event PMT stage.**
NOTE: The procedure to follow when the 30 minutes have elapsed is outlined toward the end of this document, following the instructions for administering **Task 4**.

Step 9:   **Administer the <u>Hearing</u> stage** per the *SOP_DCS_0020 - Hearing SOP*.
NOTE: Proceed to **Step 10:** if the participant is contraindicated for the hearing test.

Step 10:   **At the interview tab in Onyx locate the <u>Stroop and FAS</u> stage** and click start on that row.

Step 11:   Scan participant ID and click **Continue**.

Step 12:   Select the language and click **Next**.

Task 2 – Stroop Neuropychological Screening Test (Victoria version)

 DO NOT administer this test if a participant has a severe or complete visual impairment.

All three sub-tasks of the Stroop **must** be completed and scoreable for this measurement to be valid. If a participant is unable to complete the first or second stimulus card do not continue with the module. In Onyx, respond **'No'** to "*Could the participant complete the task*" and Onyx will automatically skip the remainder of the test.

NOTE: The module is skipped if the participant answers '**No'** twice to *"Here is a sheet of paper on which you will see solid-coloured circles. We will begin with a demonstration: I will ask you to say the colour of each circle, from left to right as quickly as possible without making any mistakes. Are you ready to begin?"* Document the factors that impaired performance, e.g., physical impairment, language barriers, etc.

Step 13:   Read the introductions provided in Onyx regarding the subsequent tasks to the participant.

Step 14:   Using the script in Onyx obtain and record receipt of the participant's <u>consent to be recorded</u>.

Step 15:   Give the participant the headphones with microphone to put on if they have consented to being recorded. If the participant has not consented to be recorded use *CRF_DCS_0019_2 – Stroop Test Case Report Form* to record their answers.

   NOTE: For all 3 sub-tasks if the participant names a color other than red, green, blue, or yellow during the trial or the actual test (i.e., states orange for yellow, purple for blue, pink instead of red, etc.) immediately correct the participant, if they don't spontaneously correct themselves; then instruct the participant to continue as rapidly as possible. DO NOT correct the participant when they confuse blue for green; red for yellow, etc. as these are errors being made on the test that need to be counted.

Sub-Task #	Sub-Task Name	Sub-Task Steps
1	Coloured dots	**Step 16:** Place the first stimulus card (with 4 dots across the top and 6 dots down with largest amount of void space being the bottom of the stimulus card) on the table and directly in front of the participant, facing them. **Step 17:** Read the instructions to the participant, as

Sub-Task #	Sub-Task Name	Sub-Task Steps	
		outlined in Onyx. Use your finger to direct the participant's eyes across the rows from left to right. **NOTE:** Participant may hold the card if required.	
		Step 18:	In Onyx complete the question and click **Next**.
		Step 19:	Administer the demonstration, as outlined in Onyx. • If one or more errors are made, the demonstration may be re-started a maximum of 2 more times. • Even if one or more errors occur during the third attempt, proceed with the test. • Do not time the demonstration.
		Step 20:	When the demo(s) is complete click **Next.**
		Step 21:	Read the instructions to participant, as outlined in Onyx. Press **Start** on the recording. and say "Go".
		Step 22:	When participant has finished the task, immediately stop the timer.
		Step 23:	Record in Onyx the _exact time_, to the nearest second, the participant took to complete this task.
		Step 24:	Inform participant that this task is finished. Click **Next**.
2	Words printed in coloured ink	**Step 25:**	Place the second stimulus card(with 4 words across, 6 words down) on the table and directly in front of the participant, facing them.
		Step 26:	Repeat Step 18: to Step 25: During the demonstration or at any point during the first row of the actual test clarify if necessary: _"Name the colors in which the words are printed."_
3	Interference	**Step 27:**	Place the third stimulus card (with 4 words across, 6 words down) on the table and directly in front of the participant, facing them.
		Step 28:	Repeat Step 18 to Step 25: During the demonstration or at any point during the first row of the actual test clarify if necessary: _"Don't read the word, tell me the color in which the word is printed."_

Task 3 – Controlled Oral Word Association Test: FAS

Step 29: Read the bold text at the top of the Onyx screen to the participant.

Step 30: In Onyx, complete the question asked, click **Next**.

Interviewers should tell participants at the start of the module that they cannot re-use the same word with a different ending. If participants do this during the test, then interviewers should caution them against continuing to do so.

Participants may respond using numbers (e.g., forty, fifty), but they cannot respond using the same number with a different ending. For example, fifty, fifty-one, fifty-two, etc. would not be acceptable. FAS_1 and FAS_2 clearly state that participants may not re-use the same word with a different ending.

Sub-Task #	Sub-Task Name	Sub-Task Instructions
1	F	**Step 31:** Read the bold text at the top of the Onyx screen to the participant. **Step 32:** Immediately after saying "Go ahead" start recording the participant's response. • If the participant is silent for 15 seconds or stops before the end of the timer, follow the script as written in Onyx. **Do not help the participant.** **Step 33:** Ask the participant to stop when the timer reaches 60 seconds and immediately stop the timer. **Step 34:** Record in Onyx whether or not the task was completed. Click **Next**.
2	A	**Step 35:** Repeat **Step 31 to Step 35.**
3	S	**Step 36:** Repeat **Step 31 to Step 35.** **Step 37:** Inform participant that the task is finished and that this is the end of the recording session. **Step 38:** Have the participant remove headset. **Step 39:** **Close the stage**

Task 4 – Choice Reaction Time Test (CRT)
DO NOT administer this test if a participant has a severe or complete visual impairment.

Discretely ensure that the participant will have enough time to complete this without being interrupted by the PMT alarm.

DO NOT commence the CRT if only 5 minutes are remaining on the timer.

Step 40: Ensure touchscreen device is available and set up.

Step 41: At the Interview Tab in Onyx locate the **Choice Reaction Test** stage and click start in that row.**

Step 42: Make sure that the participant is seated comfortably at the table. Position the touch screen in front of participant.

Step 43: Choose the language and click **Next**. Click **Start. The test will display on the interviewer's screen.**

Step 44: On the header of the test screen, left click and hold the mouse button down, drag the test window to the touch screen and maximize the window.

Step 45: Read the task instructions to the participant from the touch screen.
- The participant may only use one hand when performing this task.

- Ensure the participant understands the instructions for the task.

Step 46: Inform the participant that they will have practice trials. Press (or have the participant press) **Start** to administer the practice trials on the touch screen.

Step 47: Press (or have the participant press) **Next** to begin the second practice trial.

Step 48: Press (or have the participant press) **Next** to begin the timed trial.

Step 49: Once the timed trial is complete have the participant press the **Next** button on the touch screen.

Step 50: Click **Finish** on the interviewer's screen.

Step 51: Inform the participant that this task is finished.

Step 52: Close the Choice Reaction Test program.

Step 53: In Onyx click **Next**, then **Finish** and **Continue** to exit.

Step 54: **Go to the interview tab in Onyx and find the Social Network Questionnaire stage, click on Start in that row. Select the language and click **Next.**

Step 55: Administer the Social Network Questions.

Time Delay for Task 1 (Event PMT)
Step 56: When the 30 minutes have elapsed and the alarm is sounding (see **Step 6** above), allow a 60-second grace period for the participant to initiate a response. Continue administering the current module without turning off the alarm.

After 30 seconds with no response, you may turn off the alarm, but give the participant another 30 seconds to comment before giving the first cue.

NOTE: if the participant comments on the alarm, but their comment does not relate to the action that they are supposed to take, leave the alarm on for the 30 seconds

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and provide them the remainder of the 60 seconds before you provide the first cue. While this may be difficult, it is important to allow the participant the same amount of time to remember what they were meant to do as all other participants. Please make a note that the participant commented on the alarm.

Step 57: Using the below table, initiate the corresponding steps to complete the PMT:

Response	Steps to complete
Within 60 seconds	i. **Pause the <u>Social Network </u>stage.** ii. **Click **resume** on the <u>Event PMT </u>stage.** iii. Scan the interview ID and click **continue**. iv. Skip over the questions pertaining to the three cues, by selecting *Not applicable*
Doesn't respond within 60 seconds	i. **Pause the <u>Social Network </u>stage** and Interrupt whatever s/he is doing. ii. **Click **resume** on the <u>Event PMT </u>stage.** iii. Scan the interview ID and click **continue**. iv. Initiate provision of <u>hierarchical cues</u>, beginning with PMT_1 and PMT_1a, if applicable. v. PMT_2 and PMT_3 may be introduced in hierarchical fashion at the point(s) where the participant is unable to recall the subsequent needed action. For example, if participant responds incorrectly to PMT_1, or his/her response does not include grabbing the envelope on the desk, administer the second cue, as indicated in PMT_2. If response does not include a description of giving money to examiner or self, administer the third cue, as indicated in PMT_3. vi. Record in Onyx any behavioral observations and/or comments about the participant's performance on the task. These comments may be particularly useful when there is uncertainty about the score to assign to any of the scoring criteria (i.e., Intention to Perform, Accuracy of Response, Need of Reminders).

NOTE: If the participant verbalizes an action that s/he is supposed to do (or thinks s/he is supposed to do) as part of the test, but does not do the action, say: "Please do whatever you think you were supposed to do" regardless of whether the verbalized action is correct or not.

Step 58: In Onyx select the statement that most correctly describes the participant's;
- Intention to Perform;

- Accuracy of Response; and,

- Need of Reminders.

NOTE: Use the corresponding drop down menu to complete the statement if using answer 2-4 for the Need of Reminders.

Step 59: **Close the <u>Event-based PMT </u>stage**by clicking **Next**, **Finish** and **Continue**.

Step 60: **At the Interview Tab locate the <u>Social Network </u>stage, click **Resume****.

Step 61: Scan the interview ID, click **Continue** and complete the remainder of the questions in the module.

After the Interview: Scoring Directions
Certain tests will need to be scored <u>after</u> the participant has left the DCS. This will require listening to the corresponding recording and entering the relevant information in the <u>Stroop Scoring stage</u> in Onyx.

Scoring – Stroop Neurological ▶ Screening Test
Step 1: Click on the play button to listen to the recording of the participant's response.

Step 2: Answer the question: "Was the recording quality good enough to score?"
- If **Yes**, continue to **Step 3**.

- If **No,** answer the <u>"What is the problem with the recording?" question</u>, repeat **Step 2** for the remaining sub-tasks.

  NOTE: Recordings that are damaged or cut off should have a "No" response.

Step 3: In ONYX, click the boxes corresponding to any errors that the participant made.
NOTE: Spontaneous corrections by the participant are scored as correct.

Step 4: Enter the number of errors into Onyx. Ensure that the number of errors entered matches the number of checkmarks in Step 3.

ONLY ENTER THE ERRORS MADE AND THE TOTAL NUMBER OF ERRORS MADE.

Step 5: Repeat **Steps 1 – 4** of **Scoring – Stroop Neurological Screening Test** for each sub-task.

Step 6: Record any comments about the test in the notes/comments section.

Step 7: Click **Next, Finish** and **Continue.**

THINGS TO NOTE WHEN ADMINISTERING:
- Tests that are not administered correctly are not to be scored.

- Prompting invalidates tests and no data should be entered for that section of the test.

- If a participant misses a dot/word/color on a row, only mark the missed response as an error, not every response from that point forward.

- Spontaneous corrections made by the participant are to be marked as correct.

- The number of checked errors must reach the number entered in the score field.

- Refer to *Stroop Training Presentation_REV.pptx* for complete details on how to score the Stroop cognition test.

9.0 Documentation and Forms:
- **CRF_DCS_0019_1** – Prospective Memory Test (PMT) Case Report Form

- **CRF_DCS_0019_2** – Stroop Test Case Report Form

- **CRF_DCS_0019_3** – Controlled Oral Word Association Test (FAS) Case Report

- **CRF_DCS_0019_4** – Social Network Questionnaire Case Report Form

10.0 References:
- Loewenstein D, Acevedo A. The Prospective Memory Test: Administration and scoring manual. Unpublished manuscript. University of Miami School of Medicine; 2001.

- Moroni C, Bayard S. Adaptation francophone de l'épreuve du Stroop Victoria auprès de sujets âgés sains. Processus d'inhibition: Quelle est leur evolution après 50 ans? Psychol Neuropsychiatr Vieil. 2009; 2:121-9.

- Strauss E, Sherman EMS, Spreen O. A compendium of neuropsychological tests: administration, norms, and commentary. 3rd ed. Oxford: Oxford University Press; 2006.

- Stroop Test: Victoria Version: Manual of Instructions and Norms

F2 Revision History:

New Version #	Revision Date	Revision Author	Content Approval
4.0	2018-APR-09	Lorraine Moss	Harriet Sauve
Summary of Revisions			
Added references to the Social Network Questionnaire throughout document.			
Modified most uses of 'module' to 'stage', which is more accurate.			
In **Task 2, Step 16** added **Note:** For all 3 sub-tasks if the participant names a color other than red, green, blue, or yellow during the trial or the actual test (i.e., states orange for yellow, purple for blue, etc.) immediately correct the participant, if they don't spontaneously correct themselves; then instruct the participant to continue as rapidly as possible. DO NOT correct the participant when they confuse blue for green; red for yellow, etc. as these are errors being made on the test that need to be counted.			
In **Task 2**, **sub-task 2** and **3**, added **Step 27** and **Step 29**.			