Functions affected and related tests

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Contents

Intro to FTD

Dementia : loss of memory, language, problem-solving and other thinking abilities that are severe enough to interfere with daily life.
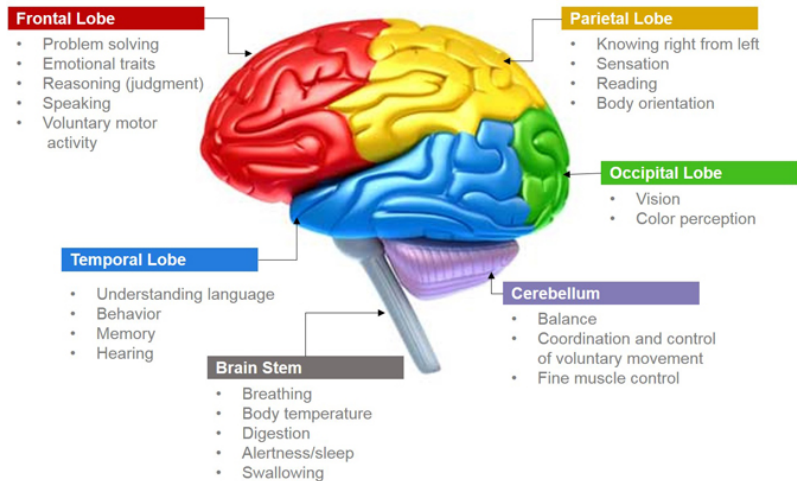Group of symptoms caused by disorders that affect the brain.
Dementia patients may :

- ▶ not be able to think well enough to do normal activities.
- ▶ may lose their ability to solve problems or control their emotions.
- ▶ suffer personality change including not recognizing their ownself.
- ▶ become agitated
- ▶ see things not present

Frontotemporal Dementia affects the frontal and temporal lobes.

Brain parts

Frontal Lobe
- Problem solving
- Emotional traits
- Reasoning (judgment)
- Speaking
- Voluntary motor activity

Parietal Lobe
- Knowing right from left
- Sensation
- Reading
- Body orientation

Occipital Lobe
- Vision
- Color perception

Temporal Lobe
- Understanding language
- Behavior
- Memory
- Hearing

Brain Stem
- Breathing
- Body temperature
- Digestion
- Alertness/sleep
- Swallowing

Cerebellum
- Balance
- Coordination and control of voluntary movement
- Fine muscle control

Intro to functions of lobes

Frontal lobes of brain :

1. helping in thinking
2. determine the social behaviour of a person
3. helps in communication

Temporal lobes of brain centers around :

1. auditory stimuli
2. memory
3. emotion.

So when these parts of brain are affected then all of the above activities of a person are affected.

Effects of Dementia

- **Misperceptions :** person sees one thing as something else. For example, mistaking blue floor tiles for water.
- **Misidentifications :** person has problems identifying specific objects and people. For example, mistaking their son for their husband.
- **Visuo-Spatial difficulties :**, when the brain has problems processing information about 3D objects (may be sparred in some cases).
- **Time Shifting :** when a person's experience is that they are living at an earlier time in their life. They may :
  1. become disorientated and confused about time and place.
  2. not recognise friends and family as they look now, expecting them to be much younger
  3. think that people who have died are still alive
  4. also not recognise themselves in a mirror with expectation of seeing thier younger self.

Effects of Dementia

▶ Hallucination is an experience of something that is not really there. It can involve any or all of the senses. auditory hallucinations – hearing things that aren't there, like voices or footsteps olfactory hallucinations – smelling things that aren't there, such as smoke or perfume tactile hallucinations – physically feeling things that aren't there, such as being kissed or insects crawling over their skin gustatory hallucinations – tasting things that aren't there, such as a metallic taste in their mouth.

▶ Delusions :-It is common for people with dementia to experience delusions (or strongly held false beliefs), which can also take the form of paranoia. Common delusions include theft or believing loved ones are trying to harm them.Dementia can make a person suspicious of the people around them

Frontotemporal Dementia

Frontotemporal dementia (FTD) or frontotemporal degenerations refers to a group of disorders caused by progressive nerve cell loss in the brain's frontal lobe or temporal lobe. The nerve cell damage caused by frontotemporal dementia leads to loss of function in these brain regions, which variably cause deterioration in behavior, personality or difficulty with producing or comprehending language. Frontotemporal dementia is caused by clumps of abnormal protein forming inside brain cells. These are thought to damage the cells and stop them working properly. The proteins mainly build up in the frontal and temporal lobes of the brain at the front and sides.

Symptoms of Frontotemporal Dementia

- **Personality and behaviour changes**
  - acting inappropriately or impulsively, appearing selfish or unsympathetic, neglecting personal hygiene, overeating, or loss of motivation
- **Language Problem :**
  - speaking slowly, struggling to make the right sounds when saying a word, getting words in the wrong order, or using words incorrectly
- **Problems with mental abilities :**
  - getting distracted easily, struggling with planning and organization
- **Compulsive behavior :**
  - – repetitive motion such as clapping hands, tapping feet repeatedly .It also includes repeating the same sounds, words or phrases.

Addenbrooke's cognitive examination III Test

Addenbrooke's cognitive examination III is a screening test is useful in the detection of frontotemporal dementia.

- ▶ ACE-III tests five coginitive domains :
    - ■ Attention
    - ■ Memory
    - ■ Fluency
    - ■ Language
    - ■ Visuospatial
- ▶ **Administration time :**
    - ■ 20 minutes

Addenbrooke's cognitive examination III Test

- ▶ **Attention :** Attention is tested by asking the patient for the date including the season and the current location ; repeating back three simple words ; and serial subtraction. An example is something like subtract seven from 100 and then continue subtracting seven away from each new number.
- ▶ **Memory :** Memory is tested by asking the patient to recall three words previously repeated ; memorizing and recalling a fictional name and address ; and recalling widely known historical facts.
- ▶ **Fluency :** Fluency is tested by asking the patient to say as many words as they can think of starting with a specified letter within 1 minute ; and naming as many animals as they can think of in 1 minute.

Addenbrooke's cognitive examination III Test

- **Language :** Language is tested by asking the patient to complete a set of sequenced physical commands using a pencil and piece of paper such as "place the paper on top of the pencil"; to write two grammatically-complete sentences; to repeat several polysyllabic words and two short proverbs; to name the objects shown in 12 line drawings, and answer contextual questions about some of the objects; and to read aloud five commonly-mispronounced words.

- **Visuospatial :** Visuospatial abilities are tested by asking the patient to copy two diagrams, to draw a clock face with the hands set at a specified time, to count sets of dots, and to recognize four fragmented letters

Addenbrooke's cognitive examination III Test

Scoring	
Cognitive Domain	Points
Attention	18
Memory	26
Fluency	14
Language	26
Visuospatial	16

▶ **Cutoff :** The results of each activity are scored to give a total score out of 100. The
score needs to be interpreted in the context of the patient's overall history and
examination, but a score of 88 and above is considered normal; below 83 is
abnormal; and between 83 and 87 is inconclusive.

Pulse Tracker Test

- **Functions affected :**
  - Repetitive compulsive behaviours such as tapping or smacking lips.
  - Among all compulsive behaviours, tapping can be easily detected using a computer.

- **Tapping Test :**
  - A circle randomly pops on screen.
  - User is prompted to tap on the circle.
  - A 10 sec duration is given until next circle is shown.
  - During that interval, Repetitive behaviour is noted.
  - We can also apply 'serious gaming' introduced in PDF : "Mobile based Detection and prevention of Alzheimer's Disease". 'Tap the dot' is a similar simulation.

- **Test Policies :**
  - Repetitive behaviour and basic attention skills will be tested
  - Tapping 'White' circle will result in reward.
  - Tapping 'Red' circle will result in penalty.
  - A reasonable time (5 sec) is given for tapping the circle.
  - In 10 sec duration, repetitive behaviour is noted.

Trail Making Test

- **Functions affected :**
  - bvFTD participants display a pattern of visual search behavior consisting of :
    1. decrease in accuracy,
    2. an increase in response time,
    3. corresponding increase in the number and length of eye movements made during visual search.
  - Its purpose is to detect brain injury.

Trail Making Test

Reference

- **Test Description :**
    - It is divided in two parts : A/B
    - **Administration time required :** 5-10 minutes
    - **Practical Administration :**
    - TEST A :
        1. Give a Demo to the user (clarity about test).
        2. A randomly generated data consisting of unordered numbers at random positions is shown on the screen.
        3. User has to connect them in ascending order without lifting the hand from mouse/touchpad.
        4. If they go in a wrong way, point it out and have them correct it.
        5. Calculate the completion time (includes correction time).
        6. Note if the user followed the correction advise or not.
    - TEST B :

Trail Making Test

Reference

- **Test Description :**
  - It is divided in two parts : A/B
  - **Administration time required :** 5-10 minutes
  - **Practical Administration :**
  - TEST A :
  - TEST B :
    1. It is same as Test A except we will alternate between numbers and letters.
    2. It is not necessary to have numbers and letters, any comparable thing is a good candidate. For e.g., size, count of things etc.
  - Scoring Procedure : Results of both parts are reported as number of seconds taken for test completion. Higher Score reveals greater impairment.

Part	Average	Deficient	Rule of Thumb
Trail A	29 sec	$\geq 78 sec$	90 sec
Trail B	75 sec	$\geq 273 sec$	3 min

Trail Making Test

- **Trail Making Test Target Points :**
    - **Visual Search Speed :**
        - It is required to test how fast the subject is able to detect and scan for a sequence in an unordered data.
        - The objects have to be necessarily comparable.
    - **Scanning :**
    - **Speed Of Processing :**
    - **Mental Flexibility :**

Trail Making Test

- **Trail Making Test Target Points :**
  - **Visual Search Speed :**
  - **Scanning :**
    - Apart from speed of scanning, we are also interested in accuracy of scanning.
    - It test attention for instances when two or more events/things occurring at the same point in time/space, for e.g. in motion objects out of which one has to be chosen based on color or shape or both.
  - **Speed Of Processing :**
  - **Mental Flexibility :**

Trail Making Test

- **Trail Making Test Target Points :**
  - **Visual Search Speed :**
  - **Scanning :**
  - **Speed Of Processing :**
    - We will correct the user if he/she make a mistake.
    - Here, we test the speed with which the subject corrects himself/herself given a correct answer.
  - **Mental Flexibility :**

Trail Making Test

- **Trail Making Test Target Points :**
  - **Visual Search Speed :**
  - **Scanning :**
  - **Speed Of Processing :**
  - **Mental Flexibility :**
    - It is tested in Part B of the test.
    - It corresponds to how well user can find a correct solution in two varying things.

Language test : Animal fluency and Boston naming test

Animal Fluency Test

- ▶ **Process**
- ▶ The animal fluency test is a psychological assessment tool that involves the patient naming as many animals as possible within a 60-second time period. The clinician records the number of animals named. If the patient named 15 or fewer animals within the 60-second time frame this may indicate earlystages of dementia or the development of a cognitive impairment.

- ▶ **Importance**
- ▶ The Animal Fluency Test can be used to measure an individual's ability to name animals, which can provide useful information about their language skills and vocabulary. If a person's score on the test is significantly lower than what would be expected for their age and education level, it may be an indication of declining cognitive function and a possible sign of dementia.

Language test : Animal fluency and Boston naming test

Pros and Cons Of Animal Fluency Test

- ▶ **Pros :**
  - The test is quick and easy to administer, making it a practical tool for assessing a large number of individuals in a short period of time.
  - It is a standardized measure, with established norms and scoring criteria, which allows for consistent and reliable evaluation of test-takers.
  - The test can be administered in different formats (e.g., orally, in writing) to accommodate different learning styles and abilities.
- ▶ **Cons :**
  - The test may not accurately reflect a person's overall knowledge about animals, as it only measures their ability to name specific species within a set time limit.
  - We should be careful not to attempt to diagnose people based on this test alone as there can be many other influencing factors to be considered like the age and education of the individual.

Language test : Animal fluency and Boston naming test

- **STEPS involved during administering the Animal Fluency Test**
  1. Prepare the test materials : Gather the materials you will need to administer the test (e.g., timer, pencil and paper).
  2. Clearly explain the instructions for the test to the person being tested.
  3. Administer the test : Begin the test and start the timer.The person should name each animal as quickly and accurately as possible.
  4. Record the responses : As the person names each animal, record their responses on a separate sheet of paper or in a computer program.
  5. SCORING : Count all animals, including birds, fish, reptiles, insects, humans, extinct animals, etc. Credit can be given for general category terms (e.g., dog) and for specific instances (e.g., terriers) when both are given. Credit only one item when people name the same animal at different developmental stages (e.g., sheep, lamb).
  6. Finally Interpret the results : Use the score on the Animal Fluency Test to evaluate the person's knowledge and vocabulary related to animals. If the score is significantly lower than what would be expected for their age and education level, it may be an indication of language difficulties or declining cognitive function i.e, Dementia.

Language test : Animal fluency and Boston naming test

Boston Naming Test

- ▶ The Boston Naming Test (BNT) is a commonly used test to assess an individual's ability to name objects. It is often administered to people with aphasia, a language disorder that can occur following a stroke or brain injury. It is also used to assess the presence and severity of a variety of other language disorders, including dementia, traumatic brain injury, and other conditions that can affect language and communication skills.

- ▶ The BNT consists of a series of black-and-white line drawings of common objects, presented one at a time to the person being tested. The person is asked to name each object as quickly and accurately as possible. The test administrator records the person's responses and scores the test based on the number of correct responses. The BNT is typically administered by a speech-language pathologist or other trained healthcare professional.

Language test : Animal fluency and Boston naming test

PROS AND CONS :

- **Pros :**
  - Widely used : The BNT is a widely used and well-known test, and it has been used in numerous research studies and clinical settings.
  - The BNT is a sensitive measure of language skills, and it can be administered repeatedly over time to track changes in an individual's performance.
  - Easy to administer and score : The BNT is relatively easy to administer and score, making it convenient to use in a variety of settings.

- **Cons :**
  - The BNT may not be suitable for individuals with severe language impairments, as it requires the person to be able to produce spoken responses.
  - Cultural bias : The BNT includes a set of specific objects that may not be familiar to everyone.
  - Limited ability to assess other aspects of language :It does not provide information on other aspects of language like syntax,comprehesion or diclosure skills.

Language test : Animal fluency and Boston naming test

- **STEPS followed during administering the BNT**
  1. **Prepare the materials :** The BNT consists of a series of black-and-white line drawings of common objects, as well as a list of the objects' names. The test administrator should have a copy of the list and the drawings, as well as a pen or pencil to record the person's responses.
  2. **Introduce the test :** Explain to the person being tested that he will be shown series of pictures and asked to name each one as quickly and accurately as possible.
  3. **Administer the test :** Present the pictures one at a time to the person being tested, and ask them to name each one. The test administrator should record the person's responses, as well as the time it takes them to name each object.
  4. **Score the test :** Count the number of correct responses and divide by the total number of items presented. This will give the person's score on the BNT.
  5. **Interpret the results :** Typically, a score of 70% or higher is considered within the normal range, while a score below 70% may indicate a language disorder or other communication difficulty.

Disinhibition test : The Measure of Online Disinhibition (MOD)

Measure of Online Disinhibition (MOD)

- ▶ The Measure of Online Disinhibition (MOD) is a psychological test that was developed to measure the degree to which an individual exhibits disinhibited behavior online.
- ▶ Disinhibited behavior is defined as the tendency to act impulsively or to lose self-control in social situations.
- ▶ The MOD consists of a series of questions that assess an individual's level of disinhibition in online communication, including their willingness to reveal personal information, their tendency to engage in risky behavior online, and their level of aggression in online interactions.
- ▶ The MOD can be used to help identify individuals who may be at risk for engaging in harmful or inappropriate behavior online, and to help develop strategies for managing disinhibited behavior in online settings.

Disinhibition test : The Measure of Online Disinhibition (MOD)

- **PROS AND CONS :**
- **Pros**
    1. The MOD is a relatively quick and easy test to administer, as it consists of a series of self-report questions that can be completed online or on paper.
    2. The MOD provides a standardized measure of online disinhibition that can be used to compare individuals or groups.
    3. The MOD may be useful in identifying individuals who may be at risk for engaging in harmful or inappropriate behavior online.

- **Cons**
    1. The MOD is based on self-report, which means that it is subject to bias and may not accurately reflect an individual's actual behavior.
    2. The MOD may not be sensitive enough to detect subtle or complex patterns of disinhibited behavior.
    3. The MOD may not be appropriate for all individuals, as it is based on Western cultural norms and may not be relevant to individuals from other cultural backgrounds.

Disinhibition test : The Measure of Online Disinhibition (MOD)

▶ Here are some examples of the types of questions that might be included in the MOD :

- Have you ever shared personal information online that you later regretted ?
- Have you ever engaged in risky or dangerous behavior online (e.g. sending compromising photos, meeting up with strangers) ?
- Have you ever engaged in aggressive or confrontational behavior online (e.g. trolling, flaming) ?
- Do you feel more confident and less self-conscious online than you do in person ?
- Have you ever lied about your identity or personal information online ?
- Do you feel like you are a different person online than you are in person ?

▶ The MOD is intended to be completed by individuals who are 18 years of age or older, and is not intended for use with children or adolescents.

Disinhibition test : The Measure of Online Disinhibition (MOD) :

▶ General steps involved in administering the MOD

1. Explain the purpose of the test to the individual being tested.
2. Provide the individual with the MOD questionnaire. The MOD can be administered online or on paper, and the individual should be given sufficient time to read and understand the questions.
3. Have the individual complete the questionnaire. The individual should be asked to respond to each question honestly and to the best of their ability. It is important to provide a private and comfortable setting for the individual to complete the questionnaire.
4. Score the questionnaire. The MOD is typically scored by tallying the total number of disinhibited responses provided by the individual. The individual's score can then be compared to normative data to determine their level of online disinhibition relative to others in their age group or demographic.
5. Review the results and discuss any concerns with the individual. It is important to review the results of the MOD with the individual and to discuss any concerns that may have been identified.If necessary, referrals to a healthcare professional or other resources may be recommended to help manage dis-inhibited behavior.

Emotion Recognition Test

- **Emotion Recogonition Test (ERT)**
- Emotion recognition is the process of identifying human emotion.
- The Emotion Recognition Task measures the ability to identify six basic emotions in facial expressions along a continuum(change) of expression magnitude.
- The basic type of emotions are :
  - Happiness
  - Sadness
  - Surprise
  - Disgust
  - Fear
  - Angerness
  - Contempt

Emotion Recognition Test

Emotions :

- ▶ **Happiness :** Feeling elicited by a fabulous thing that occurred unexpectedly
- ▶ **Sadness :** Feeling down after the loss of a person, place, or thing
- ▶ **Surprise :** Being faced with an unexpected and unusual event (without positive or negative connotation)
- ▶ **Fear :** Being faced with an imminent danger that threatens our physical well-being
- ▶ **Anger :** Extreme displeasure caused by someone's unfair or hostile action
- ▶ **Contempt :** The feeling of dislike for and superiority (usually morally) over another person, group of people, and/or their actions.
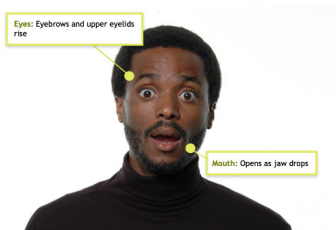
Emotion Recognition Test

Angry

Fear

Surprise

Contempt

Emotion Recognition Test

Steps :

- ▶ **Administration time :**
  - 6-10 minutes
- ▶ **Task Format :**
  - Images derived from the facial features of real individuals, each showing a specific emotion, are displayed on the screen, one at a time. Each face is displayed for 200ms.
  - The participant must select which emotion the face displayed from 6 options (sadness, happiness, fear, anger, contempt or surprise)
- ▶ **Outcome :** The outcome measures for ERT cover percentages and numbers correct or incorrect , which can be looked at either across individual emotions or across all emotions at once.

Visuospatial Test

- **Visuospatial Test**

- Visuospatial tests are used to assess an individual's ability to perceive, process, and manipulate visual information in relation to their surroundings. These tests typically involve tasks that require the individual to manipulate or rearrange visual stimuli, such as blocks or shapes, or to visualize and mentally rotate objects.

- Visuospatial abilities are important for activities such as reading maps, assembling furniture or electrical appliances, and navigating unfamiliar environments. They may also be important for certain professions, such as architects, engineers, and designers.

- Visuospatial tests may be administered in person or online, and may be self-paced or timed. Some tests may involve a combination of visual stimuli and verbal instructions, while others may be entirely visual.

Visuospatial test

▶ **Procedure and Outcome :**

- Explain the purpose of the visuospatial test to the participant. This test is designed to measure their ability to perceive, analyze, and manipulate visual information in space.
- Provide the participant with the necessary materials for the test, such as a pen or pencil, a piece of paper, and any visual stimuli or tasks that will be used.
- Begin the test by presenting the participant with a series of visual stimuli or tasks that require them to use their visuospatial abilities. These may include tasks such as matching patterns, identifying shapes or figures in a picture, or completing a puzzle.
- Observe the participant as they complete the tasks and take note of their performance. Score their responses according to the predetermined scoring criteria.
- If necessary, provide additional instruction or clarification to the participant as they complete the tasks.
- Once all tasks are completed, analyze the participant's overall performance on the visuospatial test. This can be done by comparing their scores to the scoring criteria or by reviewing their responses in more detail.
- Use the results of the visuospatial test to inform any necessary interventions or

Visuospatial test

- **Methods of Visuospatial test :**
  - **Block design tests :** These tests involve arranging blocks to match a given pattern.
  - **Mental rotation tasks :** These tasks require the individual to mentally rotate an object to match a target image.
  - **Spatial visualization tasks :** These tasks involve visualizing and manipulating objects or shapes in space.
  - **Line orientation tasks :** These tasks involve identifying the orientation of lines or shapes in relation to a reference line or shape.
  - **Paper folding tests :** These tests involve folding a piece of paper to match a given pattern or design.