Neuropsychological screening tests

Neuropsychological screening tests are assessments designed to provide a quick and preliminary evaluation of an individual's cognitive and psychological functioning. These tests are typically administered by a neuropsychologist or other trained healthcare professionals. They are often used as an initial step to identify potential cognitive impairments, neurological disorders, or brain injuries. Some common neuropsychological screening tests include:

Mini-Mental State Examination (MMSE): The MMSE is a widely used screening tool for assessing cognitive impairment, particularly in older adults. It evaluates various cognitive functions, including memory, attention, language, and orientation.

Montreal Cognitive Assessment (MoCA): Similar to the MMSE, the MoCA assesses various cognitive domains but may be more sensitive in detecting mild cognitive impairment. It includes tasks related to memory, attention, and executive functions.

Clock-Drawing Test: This test assesses a person's ability to draw a clock face with specific instructions. The test can provide information about visuospatial abilities and executive functions.

Stroop Test: The Stroop test measures selective attention and cognitive flexibility. It assesses an individual's ability to inhibit automatic responses and focus on relevant information.

Trail Making Test: This test evaluates visual attention, scanning, speed of processing, and executive functions. It consists of two parts: Part A (connecting numbers in order) and Part B (connecting numbers and letters in an alternating sequence).

Digit Span Test: This test assesses working memory and attention by requiring the individual to repeat a series of digits forward and backward.

Rey-Osterrieth Complex Figure Test: This test evaluates visuospatial abilities, visual memory, and organizational skills. It involves copying a complex geometric figure and reproducing it from memory.

Verbal Fluency Tests: These tests assess language and executive functions. They can involve generating as many words as possible within a specific category (semantic fluency) or starting with a particular letter (phonemic fluency).

Boston Naming Test: This test assesses naming and language skills by requiring the individual to name pictured objects.

Symbol-Digit Modalities Test (SDMT): The SDMT measures processing speed and attention by matching symbols to numbers according to a key.

It's important to note that while neuropsychological screening tests can help identify potential cognitive issues, they are not comprehensive diagnostic tools. They are often used as a first step in a more extensive evaluation, and further assessment may be needed to confirm diagnoses and develop treatment plans. Additionally, the choice of screening test may vary depending on the specific cognitive functions being assessed and the individual's age, language, and cultural background.

EpiTrack® and EpiTrack® Junior are short and repeatable neuropsychological screening tests for the

assessment and monitoring of cognition along with antiepileptic treatment in epilepsy patients.

A study involved 33 drug-resistant epilepsy (DRE) patients who were assessed with EpiTrack as a part of the clinical vagus nerve stimulation (VNS) protocol. Evaluations were scheduled prior to VNS implantation and then at 6 months, 12 months, and yearly thereafter. However, the COVID-19 pandemic disrupted follow-up. Therefore, changes in EpiTrack total scores over time were analyzed using a Mixed-Effects Linear Regression model to compensate for the variation in follow-up duration when predicting EpiTrack total score changes over five years.

The median follow-up time was 29 months. During each month, the EpiTrack total score was predicted to increase by 0.07 units (95% confidence interval (CI): 0.01 to 0.12, p = 0.02), corresponding to a change from a baseline score of 27.3 (severe impairment) to a score of 28.9 (mild impairment) at two years and to a score of 31.5 (almost normal) at five years. In the group of patients with psychiatric comorbidities, the EpiTrack total score increased by 0.14 units per month (p = 0.003), which was 3.5-fold higher than the increase of patients without psychiatric comorbidities. For the patients taking 1-2 antiseizure medications (ASMs), the EpiTrack total score increased by 0.11 units per month (p = 0.005), which was almost quadruple the rate of patients taking 3-4 ASMs.

Based on EpiTrack total scores, the LME model predicted a four-point improvement in executive functions among DRE patients five years after the initiation of VNS, representing a clinically meaningful change. DRE patients with comorbid depression seemed to experience the most cognitive benefits. Additionally, better cognitive outcomes were achieved if the patient took less than three ASMs [1)].

1)
Lähde N, Basnyat P, Raitanen J, Lehtimäki K, Rosti-Otajärvi E, Peltola J. Longitudinal EpiTrack assessment of executive functions following vagus nerve stimulation therapy in patients with drug-resistant epilepsy. Epilepsia Open. 2023 Oct 27. doi: 10.1002/epi4.12855. Epub ahead of print. PMID: 37897151.