

Cognitive function

Cognitive function refers to the **mental** processes involved in acquiring **knowledge** and understanding through **thought**, **experience**, and the senses. These functions are critical for everyday activities and encompass a wide range of abilities, such as:

Key Components

Attention: The ability to focus on specific stimuli or tasks while ignoring distractions.

Memory: The process of encoding, storing, and retrieving information. It includes:

Short-term memory (working memory)

Long-term memory (episodic, semantic, and procedural memory)

Executive Functions: High-level processes that include:

Planning and organizing

Problem-solving

Decision-making

Inhibitory control and flexible thinking

Language: Skills involved in understanding and producing spoken and written communication.

Perception: The ability to interpret sensory input (e.g., visual, auditory, tactile) to understand the environment.

Reasoning and Logic: The capacity for abstract thought, recognizing patterns, and drawing conclusions.

Processing Speed: The rate at which the brain processes information.

Factors Influencing Cognitive Function:

Biological: Age, genetics, and neurological health.

Lifestyle: Diet, physical activity, and sleep.

Environmental: Education, stress levels, and access to stimulating activities.

Health Conditions: Disorders like Alzheimer's disease, stroke, and traumatic brain injury can impact cognitive abilities.

Enhancing Cognitive Function:

Mental Stimulation: Activities like reading, puzzles, and learning new skills.

Physical Activity: Regular exercise to promote blood flow to the brain.

Healthy Diet: Consuming nutrients that support brain health, such as omega-3 fatty acids, antioxidants, and vitamins.

Sleep: Adequate rest to consolidate memories and refresh cognitive resources.

Stress Management: Practices like mindfulness and meditation to reduce the negative impact of stress on the brain.

A neurocognitive deficit is a reduction or impairment of cognitive function in one of these areas, but particularly when physical changes can be seen to have occurred in the brain, such as after neurological illness, mental illness, drug use, or brain injury.

A clinical neuropsychologist may specialise in using neuropsychological tests to detect and understand such deficits, and may be involved in the rehabilitation of an affected person. Some neuropsychologist however adopt non-invasive procedures such as the cognitive matrix level (CML) cognitive psychotherapists. The discipline that studies neurocognitive deficits to infer normal psychological function is called cognitive neuropsychology.

Factors such as aging and disease may affect cognitive function over time, resulting in issues like memory loss and trouble thinking of the right words while speaking or writing.

Neurocognitive function is an important determinant of [QoL](#). Not surprisingly, neurocognitive function assessments have been incorporated as major components of patient assessments, along with common and widely used questionnaires to assess health related QoL ([HRQoL](#)), e.g., [EORTC QLQ-C30](#), and Functional Assessment of Cancer Therapy (FACT) cancer-specific scales. Indeed, neurocognitive function has been shown to be a valid predictor of long-term QoL

Predicting cognitive function following resective surgery remains an important clinical goal. Each MRI neuroimaging technique can potentially provide unique and distinct insight into changes that occur in the structural or functional organization of “at-risk” cognitive functions.

Overall, reported test scores were either ambiguous/incorrect or incomplete in 23% of cases, with higher individual frequencies for two screening instruments recommended for use in primary care, the [Six item Cognitive Impairment Test](#) (26%) and the [General Practitioner Assessment of Cognition](#) (32%).

Errors are not infrequent in the scoring and reporting of cognitive screening instruments administered in primary care. More training in their correct use and scoring is required ¹⁾.

Although [meningioma](#) patients show deficits in [objective cognitive functioning](#) (OCF) measured with

neuropsychological tests, subjective cognitive functioning (SCF) has received little attention.

van Lonkhuizen et al., investigated SCF from pre- to post-surgery and its associations with OCF, psychological, sociodemographic, and clinical characteristics.

SCF was measured using the Cognitive Failures Questionnaire (CFQ) one day before (T0), and three (T3) and twelve months (T12) after surgery. Patients' scores were compared to normative data and changes over time were assessed. The neuropsychological battery CNS Vital Signs and the Hospital Anxiety and Depression Scale were administered. Correlations of SCF with OCF, psychological, sociodemographic, and clinical characteristics were explored.

Patients reported significantly better SCF as compared to controls at T0 (N=54) and T3 (N=242), but not at T12 (N=50). A significant decrease in group level SCF was observed from T0 to T12 (n=24, $p < .001$). SCF was associated with anxiety at all time points ($r_s = -0.543$ to -0.352) and with depression at T3 and T12 ($r = -0.338$ and -0.574), but not with OCF, sociodemographic, or clinical characteristics ($r_s = -0.202$ to 0.288).

Meningioma patients experienced better SCF as compared to controls before and three months after surgery, which might be the result of phenomena related to disease and recovery. As the findings suggest that cognitive symptoms might increase later on, future studies should further investigate the course of SCF in meningioma patients. In clinical practice, measurements of SCF should be combined with those of OCF and psychological distress in order to determine whether and which interventions are needed ²⁾.

Cognitive functioning in glioma

Cognitive functioning in glioma.

Cognitive functioning in Parkinson's disease

Cognitive functioning in Parkinson's disease.

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Cannon P, Larner AJ. Errors in the scoring and reporting of cognitive screening instruments administered in primary care. *Neurodegener Dis Manag*. 2016 Jul 13. [Epub ahead of print] PubMed PMID: 27411056.

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van Lonkhuizen PJC, Rijnen SJM, van der Linden SD, Rutten GM, Gehring K, Sitskoorn MM. Subjective cognitive functioning in patients with a meningioma: its course and association with objective cognitive functioning and psychological symptoms. *Psychooncology*. 2019 May 29. doi: 10.1002/pon.5136. [Epub ahead of print] PubMed PMID: 31141624.

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