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Mental Health and AI

Ageing and Mental Decline

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Topics to be covered

- **The Elderly Age**
- **Mental Changes**
 - Symptoms of Cognitive Functions
 - Cognitive Disorder
 - Stadiums of Dementia
- **Where can the AI help?**
 - Healthcare: early detection
 - Social Care: care support

The Elderly Age

- **When does the elderly age begin?**
 - When retirement does, at the age of 65?
 - Or when society considers someone old, or when those affected themselves categorize themselves as old (Bálint and Spéder 2012)?
 - In 2016, Hungarian adults placed this threshold at an average age of 68,3.
 - The WHO says between 75 – 90 is the “third age”
- **How can we describe the “third age” or old age?**
 - **Health status**
 - **Dependency on others**
 - **Mental capabilities**

Mental Changes - Symptoms of Cognitive Functions

- **Amnesia**
- **Aphasia**
- **Apraxia**
- **Agnosia**

Symptoms of Cognitive Functions - Amnesia

Inability to retain new information (anterograde amnesia)

Trouble with remembering older memories (retrograde amnesia)

- Episodic memory (remembering personal life events)
- Semantic memory (remembering facts and information about the world),
- Visuospatial memory (recalling familiar places, faces)
- Working memory (recalling a list of solos or numbers after hearing them directly)

Symptoms of Cognitive Functions - Aphasia

The two basic types of aphasia, Broca's motor and Wernicke's sensory aphasia, occur depending on the localization of the cortical lesions (dominant hemisphere frontal lobe vs. temporal lobe).

- Expressive or amnesic aphasia: confusion in naming objects and actions, difficulty in finding words and circumscribing.
- During receptive or semantic aphasia, the understanding of speech is impaired, and the meaning of words is also lost.

Symptoms of Cognitive Functions - Apraxia

Difficulty performing complex sequences of actions, which is not explained by clumsiness or muscle weakness.

Types of apraxia occurring in dementia:

- **dressng apraxia:** disorder of spatial manipulation and motor execution required for dressing
- **ideational apraxia:** movement planning is disturbed
- **ideomotor apraxia:** movement planning is preserved, execution is disturbed
- **constructional apraxia:** disturbance in the performance of movement tasks requiring spatial perception
- **walk apraxia:** which is also called frontal gait disorder, dysbasia

Symptoms of Cognitive Functions - Agnosia

Disturbance of the perceptual system, in addition to well-functioning sensory functions.

Types of agnosia occurring in dementia:

- **visual agnosia:** trouble recognizing and naming the object seen
- **prosopagnosia:** loss of the ability to recognize faces

Mental Changes - Cognitive Disorders

- **Subjective Memory Impairment (SMI)**
- **Mild Cognitive Impairment (MCI)**
- **NeuroCognitive Disorders (NCD) - Dementia**

Subjective Memory Impairment (SMI)

The person notice a subjective decline in their thinking abilities, but the criteria for MCI or NCD (Dementia) are not met

There can be many causes, most often secondary. For example, it can be triggered by depression or stress.

Mild Cognitive Impairment (MCI)

Cognitive functions decline exceeds the "normal" range, but still do not meet the criteria to be called NCD of Dementia

MCI can be:

- Amnestic (affecting memory domain)
- Non-amnestic (affecting one, or more than one other cognitive function)

Neurocognitive Disorders (NCD) - Dementia

Group of symptoms, where the primary damage affects cognitive functions

Acquired! It does not develop with aging, meaning that the impairment of cognitive performance has not been present since birth or early mental development, but rather shows deterioration compared to previous level

Neurocognitive Disorders (NCD) - Dementia

Minor Neurocognitive Disorders

- A. There is evidence of moderate cognitive decline from previous levels of performance in one or more cognitive domains:
- The person or an informed relative is concerning about a significant decline in cognitive functions
 - Significant impairment of a cognitive performance, preferably based on standardized neuropsychological test, or failing that based on other quantified clinical measures.
- B. Cognitive deficits do not hinder independence in everyday activities, the complex instrumental activities are preserved, but more effort is required from the person
- C. Cognitive deficits are not exclusively associated with delirium
- D. The cognitive deficits can not be explained better by another mental disorder (for example: major depressive disorder, or schizophrenia)

Neurocognitive Disorders (NCD) - Dementia

Major Neurocognitive Disorders

- A. There is evidence of significant cognitive decline from previous levels of performance in one or more cognitive domains:
- The person or an informed relative is concerning about a significant decline in cognitive functions
 - Significant impairment of a cognitive performance, preferably based on standardized neuropsychological test, or failing that based on other quantified clinical measures.
- B. Cognitive deficits hinder independence in everyday activities, at least help is needed during complex instrumental activities of everyday life, such as paying bills, preparing medical pills...
- C. Cognitive deficits are not exclusively associated with delirium
- D. The cognitive deficits can not be explained better by another mental disorder (for example: major depressive disorder, or schizophrenia)

Summary – Symptoms of dementia

- **Based on clinical aspects, we distinguish 3 main groups of symptoms:**
 - 1. Cognitive symptoms**
 - 2. Behavioral and Psychological symptoms**
 - 3. Activity of daily living – This is the base, how stadiums of dementia has been classified**

Stadiums of Dementia

DIAGNOSIS

Mild cognitive impairment

Mild stage

Intermediate stage

Severe stage

MEMORY DISORDER

MEMORY DISORDER

MEMORY DISORDER

MEMORY DISORDER

COGNITIVE DISORDER

COGNITIVE DISORDER

COGNITIVE DISORDER

MENTAL DISORDER

MENTAL DISORDER

MENTAL DISORDER

BEHAVIORAL DISORDER

BEHAVIORAL DISORDER

PHYSICAL SYMPTOMS

SELF SUSTAINMENT

SELF SUSTAINMENT

SELF SUSTAINMENT

SELF SUSTAINMENT

STILL WORKING

STILL WORKING

INCAPABLE

MISSING

28-27/30

26-20/30

19-10/30

9-0/30

MMSE test score

Detection of dementia

“Early detection of dementia is an international health priority and an important element of the National Dementia Strategies, however, the advantages or disadvantages of population screening for dementia have not been proven at the moment, so it is not recommended in national screening programs.”

“Case recognition” is recommended in clinical practice, through the examination of a patient appearing for a medical consultation for another reason.”

Detection of dementia

The criteria, how the professional guidelines describe high-risk groups are as follows:

- **A person over the age of 60 with a history of cardiovascular disease, stroke, diabetes mellitus, COPD, obesity**
- **After admission to the emergency department of a person over 75 years, if they have not yet been examined for dementia**

Detection

Health Professional Guideline

Directive Diagnosis, treatments
and care of dementia

Type: Clinical health professional guideline

Identifier: 002104

Publication date: June 14, 2022

Validity period: May 31, 2025.

Issued by: Ministry of the Interior

Printed version: Health Gazette

Digital form: <http://kollegium.aEEK.hu>

Clinical health professional guideline 002104
Release date: June 14, 2022.

Detection using AI help without symptoms



Stadiums of Dementia

	AI DIAGNOSIS		DIAGNOSIS	
Mild cognitive impairment	Mild stage	Intermediate stage	Severe stage	
MEMORY DISORDER	MEMORY DISORDER COGNITIVE DISORDER MENTAL DISORDER	MEMORY DISORDER COGNITIVE DISORDER MENTAL DISORDER BEHAVIORAL DISORDER	MEMORY DISORDER COGNITIVE DISORDER MENTAL DISORDER BEHAVIORAL DISORDER PHYSICAL SYMPTOMS	MEMORY DISORDER COGNITIVE DISORDER MENTAL DISORDER BEHAVIORAL DISORDER PHYSICAL SYMPTOMS
SELF SUSTAINMENT STILL WORKING 28-27/30 MMSE test score	SELF SUSTAINMENT STILL WORKING 26-20/30	SELF SUSTAINMENT INCAPABLE 19-10/30	SELF SUSTAINMENT MISSING 9-0/30	



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Thank you