**Module 14: Neurocognitive Disorders**

LEARNING OBJECTIVES

**14.1. Clinical Presentation**

* Describe how delirium presents.
* Describe how major neurocognitive disorder presents.
* Describe how mild neurocognitive disorder presents.

**14.2. Epidemiology**

* Describe the epidemiology of neurocognitive disorders.

**14.3. Etiology**

* Define degenerative.
* Describe the symptoms and causes of Alzheimer’s disease.
* Describe the symptoms and causes of traumatic brain injury (TBI).
* Describe the symptoms and causes of vascular disorders.
* Describe the symptoms and causes of substance/medication-induced major or mild NCD .
* Describe the symptoms and causes of dementia with Lewy bodies.
* Describe the symptoms and causes of frontotemporal NCD.
* Describe the symptoms and causes of Parkinson’s disease.
* Describe the symptoms and causes of Huntington’s disease.
* Describe the symptoms and causes of HIV infection.

**14.4. Treatment**

* Describe treatment options for neurocognitive disorders.

KEY TERMS

**Acetylcholine**: An important neurotransmitter that plays a role in brain functions (such as memory) and body functions (such as muscle contractions to move your muscles). Low levels of acetylcholine are associated with memory issues and muscle disorders.

**Alzheimer’s Disease**: A progressive neurodegenerative disease characterized by cortical (brain) atrophy, neuronal death, synapse loss, and accumulation of amyloid plaques and neurofibrillary tangles in the brain, causing dementia and a significant decline in functioning.

**Apolipoprotein E (ApoE)**: A gene that helps eliminate beta-amyloid by-products from the brain. One of its variants, the e4 allele, is implicated in the development of Alzheimer’s disease by reducing the production of ApoE, thus increasing the number of beta-amyloid plaques.

**Atherosclerosis**: The clogging of arteries due to a build-up of plaque, which can lead to vascular disorders like strokes.

**Beta-Amyloid Plaques**: Large bundles of plaque that develop between neurons in Alzheimer’s disease. They are believed to appear before the development of dementia symptoms and contribute to neuron death, inflammation, and loss of cellular connections.

**Chronic Traumatic Encephalopathy (CTE)**: A progressive degenerative condition due to repeated head trauma, most commonly seen in athletes and military personnel. It is linked to neurological and psychological symptoms, including an increased risk for dementia.

**Cognition**: All forms of knowing and awareness, such as perceiving, conceiving, remembering, reasoning, judging, imagining, and problem solving.

**Complex Attention:** One of the six cognitive domains on which the criteria for the various neurocognitive disorders are based. In this context, this term refers to sustained, divided, or selective attention and processing speed.

**Concussion**: A type of traumatic brain injury occurring from a significant blow to the head, causing disorientation, loss of consciousness, and other symptoms. Repeated concussions can lead to more permanent damage.

**Degenerative**: Progressive, often irreversible deterioration and loss of function.

**Delirium**: A disturbed mental state in which attention cannot be sustained, the environment is misperceived, and the stream of thought is disordered. The individual may experience changes in cognition (which can include disorientation, memory impairment, or disturbance in language), perceptual disturbances, hallucinations, illusions, and misinterpretation of sounds or sights.

**Delusions**: an often highly personal idea or belief system, not endorsed by one’s culture or subculture, that is maintained with conviction despite its irrationality or evidence to the contrary. Delusions may be transient and fragmentary, as in delirium, or highly systematized and elaborate, as in delusional disorders, though most fall between these two extremes.

**Dementia**: A generalized, pervasive deterioration of memory and at least one other cognitive function, such as language and an executive function, due to a variety of causes.

**Disorganized Thinking**: In the context of neurocognitive disorders, where an individual has difficulty sustaining, shifting, or focusing attention, leading to confusion about their location and potentially incoherent speech.

**Donepezil (Aricept)**: (Medication) An acetylcholinesterase inhibitor used as a cognitive enhancer in the management of mild to moderate dementia. By inhibiting the degradation of acetylcholine in the synaptic cleft, donepezil increases available levels of acetylcholine, thought to be associated with improved memory and other aspects of cognitive functioning.

**Executive Function:** One of the six cognitive domains on which the criteria for the various neurocognitive disorders are based. In this context, this term refers to planning, decision-making, overriding habits, mental flexibility, and responding to feedback/error correction.

**Functional Decline**: Often defined and measured by a reduction in ability to perform self-care activities of daily living (i.e., activities essential to an individual’s personal care, such as getting into and out of bed and chairs, dressing, eating, toileting and bathing, and grooming) due to reduced physical or cognitive functioning.

**Galantamine (Razadyne)**: Medication that inhibits the enzyme acetylcholinesterase and has some effects on nicotinic receptors. It is in the treatment of Alzheimer’s disease, particularly in its early or middle stages, to alleviate symptoms and slow cognitive decline.

**Hallucinations**: A false sensory perception that has a compelling sense of reality despite the absence of an external stimulus. It may affect any of the senses, but auditory hallucinations and visual hallucinations are most common.

**Hemorrhagic Stroke**: Occurs when a blood vessel bursts within the brain, leading to the death of neurons and loss of brain function.

**Huntington’s Disease**: A progressive hereditary disease associated with the degeneration of nerve cells, particularly in the cerebral cortex in the brain. This disease is characterized by abnormalities of gait and posture, motor incoordination, and involuntary jerking motions (chorea), as well as dementia, mood disturbances, and personality and behavioral changes.

**Incoherent Speech**: Inability to express oneself in a clear and orderly manner, most commonly manifested as disjointed and unintelligible speech. This may be an expression of disorganized and impaired thinking.

**Ischemic Stroke**: Occurs when a blood clot blocks blood flow in an artery within the brain, resulting in neuron death and loss of brain function.

**Language:** One of the six cognitive domains on which the criteria for the various neurocognitive disorders are based. In this context, this term refers to expressive language and receptive language.

**Learning and Memory:** One of the six cognitive domains on which the criteria for the various neurocognitive disorders are based. In this context, this term refers to cued recall, immediate or long-term memory, and implicit learning.

**Levodopa**: A medication used in the treatment of Parkinson’s disease to increase dopamine availability, thereby relieving physical and cognitive symptoms.

**Lewy Bodies**: Irregular brain cells resulting from the buildup of abnormal proteins in the nuclei of neurons, leading to a depletion of acetylcholine and dopamine. This depletion causes hallucinations, delusions, and cognitive impairment in Lewy body dementia and Parkinson’s disease.

**Major Neurocognitive Disorder**: characterized by a significant decline in at least one of the domains of cognition, which include executive function, complex attention, language, learning, memory, perceptual-motor, or social cognition. Individuals with this disorder show a significant decline in both overall cognitive functioning and the ability to independently meet the demands of daily living, such as paying bills, taking medications, or caring for oneself

**Memantine (Namenda)**: A medication that is an antagonist of glutamate receptors. It is used to slow the neurotoxicity thought to be involved in Alzheimer disease and other neurodegenerative diseases.

**Mild Neurocognitive Disorder**: Characterized by a modest decline in cognitive functioning, not as extensive as major neurocognitive disorder, without significant difficulty in daily activities but may require assistance or extra time.

**Neurocognitive Disorder Due to HIV Infection**: Occurs when HIV becomes active in the brain, leading to significant alterations in mental processes, with symptoms like slower mental processing, impaired executive function, and difficulty in learning new information.

**Neurofibrillary Tangles**: Abnormal brain structures found in Alzheimer’s disease, believed to appear after the onset of dementia symptoms. They affect the protein in cells that helps transport nutrients, impacting neuron health.

**Parkinson’s Disease**: A progressive neurodegenerative disease caused by the death of dopamine-producing neurons in a region of the brain that controls balance and coordinates muscle movement.

**Perceptual-Motor:** One of the six cognitive domains on which the criteria for the various neurocognitive disorders are based. In this context, this term refers to any abilities related to visual perception, gnosis, perceptual-motor praxis, or visuo-constructional.

**Plaque**: The build-up of deposits of fatty substances, cholesterol, cellular waste products, calcium, and fibrin in arteries, leading to atherosclerosis and contributing to vascular disorders like strokes.

**Rivastigmine (Exelon)**: This medication is a cholinesterase inhibitor, thereby increasing levels of acetylcholine in the brain. It is used to treat neurocognitive disorders.

**Self-Help Skills**: A set of basic skills needed in order for a person to live independently (e.g., dressing/undressing, self-feeding, toileting, and grooming tasks).

**Social Cognition:** One of the six cognitive domains on which the criteria for the various neurocognitive disorders are based. In this context, this term refers to recognition of emotions and theory of mind.

**Stroke**: Caused by the obstruction of arteries in the brain, leading to neuron death and loss of brain function.

**Theory of Mind:** The capacity to understand other people by ascribing mental states to them. A theory of mind includes the knowledge that others' beliefs, desires, intentions, emotions, and thoughts may be different from one's own.

**Traumatic Brain Injury (TBI)**: damage to brain tissue caused by external mechanical forces (e.g., being hit in the head with a heavy object), as evidenced by objective neurological findings, posttraumatic amnesia, skull fracture, or loss of consciousness.