01 - 21.1 Introduction and Overview

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Neurocognitive Disorders 21.1 Introduction and Overview Advances in molecular biology diagnostic techniques and medication management have significantly improved the ability to recognize and treat cognitive disorders. Cognition includes memory, language, orientation, judgment, conducting interpersonal relationships, performing actions (praxis), and problem solving. Cognitive disorders reflect disruption in one or more of these domains and are frequently complicated by behavioral symptoms. Cognitive disorders exemplify the complex interface among neurology, medicine, and psychiatry in that medical or neurological conditions often lead to cognitive disorders that, in turn, are associated with behavioral symptoms. It can be argued that of all psychiatric conditions, cognitive disorders best demonstrate how biological insults result in behavioral symptomatology. The clinician must carefully assess the history and context of the presentation of these disorders before arriving at a diagnosis and treatment plan. This century-old distinction between organic and functional disorders is outdated and has been deleted from the nomenclature. Every psychiatric disorder has an organic (i.e., biological or chemical) component. Because of this reassessment, the concept of functional disorders has been determined to be misleading, and the term functional and its historical opposite, organic, are no longer used in the current Diagnostic and Statistical Manual of Mental Disorders (DSM) nomenclature. A further indication that the dichotomy is no longer valid is the revival of the term neuropsychiatry, which emphasizes the somatic substructure on which mental operations and emotions are based; it is concerned with the psychopathological accompaniments of brain dysfunction as observed in seizure disorders, for example. Neuropsychiatry focuses on the psychiatric aspects of neurological disorders and the role of brain dysfunction in psychiatric disorders. Cognitive disorders tend to defy Occam’s razor, challenging clinicians and nosologists with multiplicity, comorbidity, and unclear boundaries. These concerns are most true in elderly adults, the demographic group most at risk for cognitive disorders. Dementias of late life are particularly problematic in this regard. Existing, although often unrecognized, dementia is a major risk factor for superimposed delirium. Moreover, certain dementias, such as dementia with Lewy bodies or late stages of Alzheimer’s disease, may have chronic clinical presentations virtually indistinguishable from delirium except for temporal onset and the lack of an identifiable acute source. Similarly, the course of nearly all subjects developing a

progressive dementia is complicated by the onset of one or more distinct behavioral syndromes, including

anxiety, depression, sleep problems, psychosis, and aggression. These symptoms can be as distressing and disabling as the primary cognitive disorder. Some of these behavioral syndromes, such as psychosis, may themselves result from independent underlying biologies and may be additive with the primary neurodegenerative process. The boundaries between types of dementia and between dementia and normal aging can be similarly diffuse. Neuropathologic studies of both clinical and population samples have revealed a surprising truth. The most common neuropathologic presentation associated with dementia reveal mixtures of Alzheimer's disease, vascular, and Lewy body pathologies. Pure syndromes are relatively less common, although often the dementia is ascribed to one of the coexisting pathologies. Strategies regarding how to understand or reconcile multiple pathologies in the clinic are needed, although they lag behind. DEFINITION Delirium Delirium is marked by short-term confusion and changes in cognition. There are four subcategories based on several causes: (1) general medical condition (e.g., infection), (2) substance induced (e.g., cocaine, opioids, phencyclidine [PCP]), (3) multiple causes (e.g., head trauma and kidney disease), and (4) other or multiple etiologies (e.g., sleep deprivation, mediation). Delirium is discussed in Section 21.2. Dementia (Major Neurocogntive Disorder) Dementia, also referred to as major neurocognitive disorder in the fifth edition of DSM (DSM-5), is marked by severe impairment in memory, judgment, orientation, and cognition. The subcategories are (1) dementia of the Alzheimer's type, which usually occurs in persons older than 65 years of age and is manifested by progressive intellectual disorientation and dementia, delusions, or depression; (2) vascular dementia, caused by vessel thrombosis or hemorrhage; (3) human immunodeficiency virus (HIV) disease; (4) head trauma; (5) Pick's disease or frontotemporal lobar degeneration; (6) Prion disease such as Creutzfeldt-Jakob disease, which is caused by a slow-growing transmittable virus); (7) substance induced, caused by toxin or medication (e.g., gasoline fumes, atropine); (8) multiple etiologies; and (9) not specified (if cause is unknown). In DSM-5, a less severe form of dementia called mild neurocognitive disorder is listed. Dementia is discussed in Section 21.3. Amnestic Disorder Amnestic disorders are classified in DSM-5 as major neurocognitive disorders caused by other medical conditions. They are marked primarily by memory impairment in addition to other cognitive symptoms. They may be caused by (1) medical conditions (hypoxia),

(2) toxins or medications (e.g., marijuana, diazepam), and (3) unknown causes. These disorders are discussed in Section 21.4. CLINICAL EVALUATION During the history taking, the clinician seeks to elicit the development of the illness. Subtle cognitive disorders, fluctuating symptoms, and progressing disease processes may be tracked effectively. The clinician should obtain a detailed rendition of changes in the patient's daily routine involving such factors as self-care, job responsibilities, and work habits; meal preparation; shopping and personal support; interactions with friends; hobbies and sports; reading interests; religious, social, and recreational activities; and ability to maintain personal finances. Understanding the past life of each patient provides an invaluable source of baseline data regarding changes in function, such as attention and concentration, intellectual abilities, personality, motor skills, and mood and perception. The examiner seeks to find the particular pursuits that the patient considers most important, or central, to his or her lifestyle and attempts to discern how those pursuits have been affected by the emerging clinical condition. Such a method provides the opportunity to appraise both the impact of

the illness and the patientspecific baseline for monitoring the effects of future therapies. Mental Status Examination After taking a thorough history, the clinician's primary tool is the assessment of the patient's mental status. As with the physical examination, the mental status examination is a means of surveying functions and abilities to allow a definition of personal strengths and weakness. It is a repeatable, structured assessment of symptoms and signs that promotes effective communication among clinicians. It also establishes the basis for future comparison, essential for documenting therapeutic effectiveness, and it allows comparisons between different patients, with a generalization of findings from one patient to another. Table 21.1-1 lists the components of a comprehensive neuropsychiatric mental status examination. Table 21.1-1 Neuropsychiatric Mental Status Examination

Cognition When testing cognitive functions, the clinician should evaluate memory; visuospatial and constructional abilities; and reading, writing, and mathematical abilities. Assessment of abstraction ability is also valuable, although a patient's performance on tasks such as proverb interpretation may be a useful bedside projective test in some patients, the specific interpretation may result from a variety of factors, such as poor education, low intelligence, and failure to understand the concept of proverbs, as well as from a broad array of primary and secondary psychopathological disturbances. PATHOLOGY AND LABORATORY EXAMINATION As with all medical tests, psychiatric evaluations such as the mental status examination must be interpreted in the overall context of thorough clinical and laboratory assessment. Psychiatric and neuropsychiatric patients require careful physical examination, especially when issues exist that involve etiologically related or comorbid medical conditions. When consulting internists and other medical specialists, the clinician must ask specific questions to focus the differential diagnostic process and use the consultation most effectively. In particular, most systemic medical or primary cerebral diseases that lead to psychopathological disturbances also manifest with a variety of peripheral or central abnormalities. A screening laboratory evaluation is sought initially and may be followed by a variety of ancillary tests to increase the diagnostic specificity. Table 21.1-2 lists such procedures,

some of which are described below. Table 21.1-2 Screening Laboratory Tests ELECTROENCEPHALOGRAPHY Electroencephalography (EEG) is an easily accessible, noninvasive test of brain dysfunction that has high sensitivity for many disorders but relatively low specificity. Beyond its recognized uses in epilepsy, EEG's greatest utility is in detecting altered electrical rhythms associated with mild delirium, space-occupying lesions, and continuing complex partial seizures (in which the patient remains conscious, although behaviorally impaired). EEG is also sensitive to metabolic and toxic

states, often showing a diffuse slowing of brain activity. The EEG is discussed in Section 3.4, Electrophysiology. COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING Computed tomography (CT) and magnetic resonance imaging (MRI) have proved to be powerful neuropsychiatric research tools. Recent developments in MRI allow the direct measurement of structures such as the thalamus, basal ganglia, hippocampus, and amygdala, as well as temporal and apical areas of the brain and the structures of the posterior fossa. MRI has largely replaced CT as the most utilitarian and cost-effective method of imaging in neuropsychiatry. Patients with acute cerebral hemorrhages or hematomas must continue to be assessed using CT, but these patients present infrequently in psychiatric settings. MRI better discriminates the interface between gray and white matter and is useful in detecting a variety of white matter lesions in the periventricular and subcortical regions. The pathophysiological significance of such findings remains to be defined.

White matter abnormalities are detected in younger patients with multiple sclerosis or human immunodeficiency virus (HIV) infection and in older patients with hypertension, vascular dementia, or dementia of the Alzheimer’s type. The prevalence of these abnormalities is also increased in healthy, aging individuals who have no defined disease process. As with CT, the greatest utility of MRI in the evaluation of patients with dementia arises from what it may exclude (tumors, vascular disease) rather than what it can demonstrate specifically. BRAIN BIOPSY Brain needle biopsy is used to diagnose a variety of disorders: Alzheimers disease, autoimmune encephalopaties, and tumors. It is conducted stereotactically and indicated when no other investigative techniques such as MRI or lumbar puncture have been sufficient to make a diagnosis. The procedure is not without risk in that seizures may occur if scar tissue forms at the biopsy site. NEUROPSYCHOLOGICAL TESTING Neuropsychological testing provides a standardized, quantitative, reproducible evaluation of a patient’s cognitive abilities. Such procedures may be useful for initial evaluation and periodic assessment. Tests are available that assess abilities across the broad array of cognitive domains, and many offer comparative normative groups or adjusted scores based on normative samples. The clinician seeking neuropsychological consultation should understand enough about the strengths and weaknesses of selected procedures to benefit fully from the results obtained. REFERENCES Balzer D. Neurocognitive disorders in DSM-5. Am J Psych. 2013;170:585. Blanc-Lapierre A, Bouvier G, Gruber A, Leffondré K, Lebailly P, Fabrigoule C, Baldi I. Cognitive disorders and occupational exposure to organophosphates: Results from the PHYTONER Study. Am J Epidemiol. 2013;177:1086. Bugnicourt J-M, Godefroy O, Chillon J-M, Choukroun G, Massy ZA. Cognitive disorders and dementia in CKD: The neglected kidney-brain axis. J Am Soc Nephrol. 2013;24:353. Bugnicourt J-M, Guegan-Massardier E, Roussel M, Martinaud O, Canaple S, Triquenot-Bagan A, Wallon D, Lamy C, Leclercq C, Hannequin D, Godefroy O. Cognitive impairment after cerebral venous thrombosis: A two-center study. J Neurol. 2013;260:1324.

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