NEUROPSYCHOLOGY MODEL LCD

Respectfully submitted to Wisconsin Physician Service Insurance Corporation (WPS) in July 2011 by the *Neuropsychology Model LCD Taskforce*, a national workgroup representing The American Academy of Clinical Neuropsychology (AACN), the American Psychological Association (APA) Division of Clinical Neuropsychology, and the National Academy of Neuropsychology (NAN), and comprised of the following members:

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I. Indications and/or Limitations of coverage and/or medical necessity

Neuropsychological assessments provide measurements of brain function that are as objective, valid, and reliable as neuroimaging (Mattarazzo, 1990; Meyer, et al., 2001), and information from neuropsychological assessments directly impacts medical management of patients by providing information about diagnosis, prognosis, and treatment of disorders that are known to impact central nervous system (CNS) functioning. In addition, neuropsychological assessments predict functional abilities across a variety of disorders (Chaytor & Schmitter-Edgecombe, 2003; Gure, Kabeto, Plassman, Piette, & Langa, 2010; Marcotte & Grant, 2010; Sbordone & Long, 1996; Stilley, Bender, Cunbar-Jacob, Sereika, & Ryan, 2010; Wilson, 1993; Wojtasik et al., 2009), and information from neuropsychological assessments is incorporated into physician discharge summaries a majority of the time (Temple, Carvalho, & Tremont, 2006). Neuropsychological tests are administered in the context of a comprehensive evaluation that synthesizes data from clinical interview, record review, medical history, and behavioral observations.

Indications for neuropsychological evaluations include a history of medical or neurological disorder compromising cognitive or behavioral functioning; congenital, genetic, or metabolic disorders known to be associated with impairments in cognitive or brain development; reported impairments in cognitive functioning; and evaluations of cognitive function as a part of the standard of care for treatment selection and treatment outcome evaluations (e.g., deep brain stimulators, epilepsy surgery). Neuropsychological assessments are not limited in relevance to patients with evidence of structural brain damage, and are frequently necessary to document impairments in patients with possible/probable neuropsychological and neurobehavioral disorders, and are the tool of choice whenever objective documentation of subjective cognitive complaints and symptom validity testing are indicated. In children and adolescents, a significant inability to develop expected knowledge, skills or abilities as required to adapt to new or changing cognitive, social, emotional, or physical demands warrants a neuropsychological evaluation. Neuropsychological testing is not excluded from medical necessity based on diagnosis alone. Rather, indications for testing are based on whether there is known or suspected neurocognitive involvement or effects, or where neuropsychological testing will impact the management of the patient by confirmation or delineation of diagnosis, or otherwise providing substantive information regarding diagnosis, treatment planning, prognosis, or quality of life.

Indications of Coverage

Neuropsychological assessment is considered medically necessary for the following indications:

- When there are mild or questionable deficits on standard mental status testing or clinical interview, and a neuropsychological assessment is needed to establish the presence of abnormalities or distinguish them from changes that may occur with normal aging, or the expected progression of other disease processes; or
- When neuropsychological data can be combined with clinical, laboratory, and neuroimaging data to assist in establishing a clinical diagnosis in neurological or systemic conditions known to affect CNS functioning; or

- When there is a need to quantify cognitive or behavioral deficits related to CNS impairment, especially when the information will be useful in determining a prognosis or informing treatment planning by determining the rate of disease progression; or
- When there is a need for a pre-surgical or treatment-related cognitive evaluation to inform whether one might safely proceed with a medical or surgical procedure that may affect brain function (e.g., deep brain stimulation, resection of brain tumors or arteriovenous malformations, epilepsy surgery, stem cell transplant) or significantly alter a patient's functional status; or
- When there is a need to assess the potential impact of adverse effects of therapeutic substances that may cause cognitive impairment (e.g., radiation, chemotherapy, antiepileptic medications), especially when this information is utilized to inform treatment planning; or
- When there is a need to monitor progression, recovery, and response to changing treatments, in patients with CNS disorders, in order to determine the most effective plan of care; or
- When there is a need for objective measurement of patients' subjective complaints about memory, attention, or other cognitive dysfunction, which serves to inform treatment by differentiating psychogenic from neurogenic syndromes (e.g., dementia vs. depression), and in some cases will result in initial detection of neurological disorders or systemic diseases affecting the brain; or
- When there is a need to inform treatment planning by determining functional abilities/impairments in individuals with known or suspected CNS disorders (e.g. capacity for employment, independent living, or movement from a family home into an institutional setting); or
- When there is a need to determine whether a patient can comprehend and participate effectively in complex treatment regimens (e.g., surgeries to modify facial appearance, hearing, or tongue debulking in craniofacial or Down syndrome patients; transplant or bariatric surgeries in patients with diminished capacity), and to determine functional capacity for health care decision-making, work, independent living, managing financial affairs, etc.; or
- When there is a need to design, administer, and/or monitor outcomes of cognitive rehabilitation procedures, such as compensatory memory training for brain-injured patients (often in collaboration with other specialists such as speech pathologists, occupational therapists, physiatrists, and rehabilitation psychologists); or
- When there is a need to inform treatment planning through identification and assessment of the neurocognitive sequelae of systemic disease (e.g., hepatic encephalopathy; anoxic/hypoxic injury associated with cardiac procedures); or
- Assessment of neurocognitive functions for the formulation of rehabilitation and/or management strategies among individuals with neuropsychiatric disorders; or
- When there is a need to diagnose cognitive or functional deficits in children and adolescents based on an inability to develop expected knowledge, skills or abilities as required to adapt to new or changing cognitive, social, emotional, or

physical demands.

Limitations of Coverage

Neuropsychological assessment is not considered medically necessary when:

- The patient is not neurologically and cognitively able to participate in a meaningful way in the testing process, or
- When used as screening tests given to the individual or to general populations [Section 1862(a)(7) of the Social Security Act does not extend coverage to screening procedures], or
- Administered for educational or vocational purposes that do not inform medical management, or
- Performed when abnormalities of brain function are not suspected, or
- Used for self-administered or self-scored inventories, or screening tests of cognitive function (whether paper-and-pencil or computerized), e.g., AIMS, Folstein Mini-Mental Status Examination, or
- Repeated when not required for medical decision-making (i.e., making a diagnosis or deciding whether to start or continue a particular rehabilitative or pharmacologic therapy), or
- Administered when the patient has a substance abuse background and any of the following apply:
    - the patient has ongoing substance abuse such that test results would be inaccurate, or
    - the patient is currently intoxicated, or
- The patient has been diagnosed previously with brain dysfunction, and there is no expectation that the testing would impact the patient's medical management.

Neuropsychological Evaluation of Adults with Disabilities Younger than 65 Years

In addition to covering persons age 65 and older, Medicare coverage extends to adults, age 20 years and older, who have received Social Security or Railroad Retirement disability benefits for at least 24 months, and to adults who have end-stage renal disease. These "young adult" Medicare recipients are among the most vulnerable people in our population and as such warrant special consideration with regard to medically necessary assessment and follow-through of cognitive problems. Neuropsychological assessments in this population directly impact treatment planning by providing information about cognitive abilities (Gold, Johnson, Treadwell, Hans, & Vichinsky, 2008; Mabbott et al., 2011; Zec et al, 2001) and predicting functional abilities (Jenkinson et al, 2011; Sievers et al, 2011; Viau et al, 2011; Wills et al, 2010)

This population includes individuals whose neuropsychological impairments vary widely in type and severity. They have documented disabilities that may change over time. Their disabilities may be consequent to:

1. Inborn chromosomal, metabolic, or structural brain abnormalities that severely limit normal functioning, such as in Down Syndrome, Fragile X Syndrome, PKU, leukodystrophies, mitochondrial myopathies, muscular dystrophies, myelomeningocele, hydrocephalus, and craniofacial syndromes;

2. Exposure to toxins that cause brain damage, such as Fetal Alcohol Syndrome, Lead Encephalopathy, or long term effects of brain radiation or chemotherapy for childhood cancer;
3. Acute illnesses that cause brain damage, such as prenatal and perinatal infections, or childhood meningitis (Bale, 2009);
4. Chronic illnesses and medical conditions that often cause brain damage, such as sickle cell anemia, cardiac disease, HIV-positive status, or advanced renal or hepatic diseases;
5. Prenatal and perinatal injuries that cause permanent damage, such as amniotic band syndrome, hypoxic-ischemic encephalopathies, cerebral palsy, and intraventricular hemorrhage;
6. Postnatal severe malnutrition (seen more commonly among abused or internationally adopted children, or in certain cases of late-treated malabsorption syndromes), which causes permanent brain injury due to severe vitamin and protein deficiencies during early brain development;
7. Postnatal CNS injury, for example, consequent to severe falls, car crashes, gunshot wounds, near-drowning, or brain surgery to treat tumors, aneurysms, or cysts.
8. Major mental illness, such as schizophrenia or autism, in which severe neuropsychological impairment is a cardinal symptom.

Neuropsychological testing is indicated for adults with Medicare coverage due to disabilities for the following purposes:

1. Deterioration in mental status or previous level of functioning, or
2. Onset of new abnormal neurological or psychiatric symptoms, or
3. Failure to adapt as expected to changing environmental conditions, or reasonable expectation that new symptoms or symptom exacerbation will occur as a result of changing environmental conditions.
4. In younger persons (children, adolescents, and young adults), an abnormally prolonged plateau in the course of normal development, suspected to be caused by central nervous system impairment.

The actual or anticipated onset of new symptoms, recurrence of symptoms, or exacerbation of symptoms, in relation to changing social and environmental conditions, is a reasonable and necessary indication to refer a patient with known CNS impairment for new or repeated neuropsychological evaluation in order to determine how best to manage patient care. For example, a young adult with severe traumatic brain damage might function in a stable way as long as parents provide constant supervision and guidance, but might be unable to develop normal capacity for self-direction and therefore fail to meet expectations for the transition from adolescence to adult life. Or, a patient with Parkinson's Disease might function adequately as long as his wife is alive to care for him, but become at risk of deterioration when she dies. These "transition points" typically are points at which neuropsychological testing will be ordered to assess the individual's capacity to meet new or changing demands. Such testing is not necessarily triggered by "changes," "new symptoms," or "deterioration"; rather, it is triggered by the awareness

that existing, stable, neurological conditions and neuropsychological impairments will obstruct the individual's capacity to adapt to changing demands. Sometimes the problem is even more complex: for example, an adult with epilepsy and intellectual disability might develop aggressive behaviors as a result of seizures, medication changes, or changes in the group home schedule. Staff or physicians may request neuropsychological assessment to identify the specific problems and recommend solutions. In this context, the neuropsychological assessment guides the referring physician and family about changes in medical and behavioral management that can improve treatment outcome in several important ways, by:

- facilitating the patient's functioning within the community,
- habilitating the patient, where possible, to deal with new and changing life demands,
- identifying and altering social/environmental impediments to enable better progress, and
- recommending strategies to compensate for irremediable disabilities.

II. Components of the Neuropsychological Evaluation

A. Record Review

The provider reviews the medical records and referral question, and determines whether a neuropsychological evaluation is appropriate.

B. Neurobehavioral Status Examination

The face-to-face evaluation begins with a neurobehavioral status exam conducted by the provider (CPT code 96116; in rural areas or where there is a shortage of providers, the neurobehavioral status exam may be administered as a telehealth service using the telehealth/"GT" modifier):

> A neurobehavioral status exam is completed prior to the administration of neuropsychological testing. The status exam involves clinical assessment of the patient, collateral interviews as appropriate, and review of prior records. The interview would involve clinical assessment of several domains including but not limited to; thinking, reasoning and judgment, e.g., acquired knowledge, attention, language, memory, planning and problem solving and visual spatial abilities. The clinical assessment would determine the types of tests and how those tests should be administered (AMA CPT Assistant, November, 2006).

(Please note that a neurobehavioral status examination, in the absence of neuropsychological testing, is insufficient to diagnose mild cognitive impairment (MCI), based on several studies that are cited in the ‘Clinical Evidence – Mild Cognitive Impairment’ section on page 11)

C. Test Selection

Information from medical records, clinical interviews, and behavioral observations is integrated to guide the selection of specific neuropsychological tests. The selection of

tests is a strategic process that varies as a function of patient characteristics (level of education, premorbid level of functioning, sensory abilities, physical limitations, fatigue level, age, ethnicity) and the goals of the evaluation (establishing a diagnosis, measuring treatment effects, etc.).

D. Test Administration

Tests are either administered directly by a provider who is State-licensed to provide neuropsychology, or by a trained technician. The technician or trainee who administers the neuropsychological tests must be supervised directly by the State-licensed neuropsychology provider. The technician may be a student or trainee as long as they are not being trained by the supervising practitioner, or required to administer the tests as a part of their education (for example, a neuropsychologist in the community may employ technicians who concurrently are students, but should not bill 96119 to Medicare when the students' work as technicians is for the purpose of training the student, or serves as a required educational practicum).

Neuropsychological tests include direct question-and-answer, object manipulation, inspection and responses to pictures or patterns, paper-and-pencil written or multiple choice tests, which measure functional impairment and abilities in:

- General intellect
- Reasoning, sequencing, problem-solving, and executive function
- Attention and concentration
- Learning and memory
- Language and communication
- Visual-spatial cognition and visual-motor praxis
- Motor and sensory function
- Mood, conduct, personality, quality of life
- Adaptive behavior (Activities of Daily Living)
- Social-emotional awareness and responsivity
- Psychopathology (e.g., psychotic thinking or somatization)
- Motivation and effort (e.g., symptom validity testing)

E. Feedback session

A post-evaluation feedback session with the patient and family members is a customary part of the neuropsychological evaluation (American Psychological Association, 2010). The feedback session emphasizes the following:

a. Discussion of the relationship between neuropsychological test results and information about diagnosis and prognosis.
b. Explanation of treatment recommendations. In addition to those recommendations that are directly managed by the patient’s medical provider (e.g. changes in medication or treatment), patients are provided with evidence-based treatment recommendations that are not typically managed by medical providers, and which are best elaborated on by providers with expertise in neuropsychological assessment, including tailored behavioral strategies to maximize functioning,

referrals to other specialty providers (e.g. psychiatry, rehabilitative therapists), recommendations for nonpharmacological interventions, and community resources.

c. Communication of results to family members in order to enhance treatment outcome for the patient. Feedback is frequently provided with family members present, which is especially important given that individuals with dementia are able to live in their home (rather than a nursing home) for an average of 18 months longer when caregivers are provided with education and connected to caregiver resources (Mittelman, Haley, Clay, & Roth, 2006).

It is also noted that neuropsychology feedback is highly valued by patients (Westervelt, Brown, Tremont, Javorsky, & Stern, 2007), and significantly improves clinical outcomes and treatment satisfaction in individuals with traumatic brain injury (Pegg et al., 2005).

III. Documentation Requirements

1. The neuropsychological assessment report should document the diagnosis and treatment recommendations.

2. The patient's medical record should contain documentation that fully supports the medical necessity for neuropsychology services under Medicare's statutory and benefit category requirements. This documentation includes, but is not limited to, relevant medical history, physical examination, and results of pertinent diagnostic tests or procedures. Documentation should include information about:

    a. suspected mental illness or neuropsychological abnormality or central nervous system dysfunction
    b. the initial evaluation that determines the need for testing
    c. the types of testing indicated
    d. the time involved and whether this is initial testing or follow-up
    e. previous testing by the same or different provider, and efforts to obtain previous test results performed
    f. the test(s) administered, scoring and interpretation
    g. treatment recommendations

3. Documentation should be legible, maintained in the patient's medical record, and made available to the Medicare Carrier upon request.

IV. Providers of Neuropsychological Services

Although it is recognized that Medicare allows for neuropsychological services to be provided by master's level practitioners (e.g. NPs, PAs) in accordance with state licensing laws and scope of practice, LCDs by other major insurance carriers limit the provision of neuropsychological tests to psychologists, neuropsychologists, and physicians with specialty training in neuropsychology (United Healthcare; Blue Cross Blue Shield). Appropriate interpretation of psychometric tests requires advanced training in psychometric theory and test construction, appropriate assessment coursework, internship/residency and post-doctoral fellowship applications in the clinical correlation

of findings from patients, and specialty training in brain-behavior relations with systematic exposure to core medical populations. These graduate psychology training experiences, followed by post-doctoral fellowship supervision, form the basis for the unique scope of clinical neuropsychology practice as recognized by public health authorities in every state, though it is also recognized that a minority of physicians might also obtain specialty training in neuropsychological testing (e.g. behavioral neurologists, developmental/behavioral pediatricians). Most states restrict the use of psychological tests in some manner, some limit use to qualified mental health professionals (e.g. Minnesota Minn. Stat. Ann. § 148.965), and a few only allow access by licensed clinical psychologists (e.g. Illinois 740 Ill. Stat. Ann. § 110/3-c). Courts have long recognized the medically necessary contribution of neuropsychologists to essential medical care (Simmons v. Mullins, 1975) and the US Supreme Court has taken steps to restrict access to tests (Detroit Edison v. NLRB, 1979) because of "the psychological profession's legitimate interest in preserving the security of tests." (p. 776, Fla DOT v. Piccolo, 2007). Other lesser credentialed paraprofessional groups simply lack the prerequisite experience to use psychological tests appropriately and in ways that do not compromise the validity of neuropsychological assessment. Neuropsychological assessment falls outside the scope of training and practice for physician assistants, nurses, social workers, and other masters-prepared clinicians.

[1] See Illinois 740 Ill. Stat. Ann. § 110/3-c; Minnesota Minn. Stat. Ann. § 148.965.

V. Clinical Evidence

As previously noted, neuropsychological tests provide measurements of brain function that are as objective, valid, and reliable as medical tests, including neuroimaging (Mattarazzo, 1990; Meyer, et al., 2001). The evidence in support of neuropsychological assessment for providing unique information about diagnosis, prognosis, treatment, and functioning is abundant across almost all neurological and psychiatric disorders, and is discussed in several neuropsychology-specific textbooks (Lezak, Howison & Loring, 2004; Morgan & Ricker, 2008, etc.), medical textbooks (Blumenfeld, 2002; Jones, 2005, etc.), neuropsychology-specific journals (Neuropsychology, The Clinical Neuropsychologist, Journal of Clinical and Experimental Neuropsychology, etc.), and medical journals (New England Journal of Medicine, Lancet, etc.), among many other sources. Although a full review of the literature is beyond the scope of this LCD, the following information provides a brief review of the link between neuropsychological assessment and medical management across several common clinical conditions:

1. Dementia
2. Mild Cognitive Impairment (MCI)
3. Stroke
4. Traumatic Brain Injury (TBI)
5. Epilepsy
6. Parkinson's Disease
7. Other Central Nervous System Disorders
8. Noncentral Nervous System Medical Conditions
9. Psychiatric Disorders

1. Dementia

The process for arriving at a clinical diagnosis of Alzheimer's disease or other dementia is complicated, given that memory complaints are common in normal aging, depression, stroke, mild cognitive impairment, as side effects of medications and medical problems, in other subtypes of dementia, and in several other conditions. As noted in a recent letter from the American Academy of Clinical Neuropsychology to the American Medical Association Dementia Work Group (2010):

> Although the integration of cognitive screening measures in standard medical care is a laudable step toward improved identification of early cases, these measures possess relatively weak sensitivity and specificity, particularly when used in individuals of high premorbid baseline intellectual ability, individuals from divergent ethnic/linguistic backgrounds, patients in the earliest phases of illness, and in cases of atypical degenerative disease (de Jager, Schrijnemaekers, Honey, & Budge, 2009; Hanna-Pladdy et al, 2010; Hoops et al, 2009; O'Bryant et al, 2008; Stephan et al, 2010). Because of their psychometric properties, standardized development, and availability of demographically-based normative data, most neuropsychological tests have superior positive predictive value and are therefore of greater utility in the clinical context (Smith, Ivnik, & Lucas, 2008). Neuropsychological evaluation can distinguish among normal aging, depression, MCI, and various dementia subtypes (Ferman et al 2006; Gavett et al, 2009; Gavett et al, 2010; Libon et al, 2007; Petersen et al, 2001; Wright & Persad, 2007) and accurately predicts conversion to Alzheimer's disease in large epidemiologic samples after 5 and 10 years (Tierney, Yao, Kiss, & McDowell 2005).

In addition, a recent letter from the American Academy of Clinical Neuropsychology (AACN) to the Wisconsin Physicians Service Insurance Corporation (WPS) (2011) provided additional evidence for the use of neuropsychological assessments in dementia:

> It is noted that neuropsychological assessments significantly increase diagnostic accuracy in dementia even after a clinical assessment with a physician specialist (Geroldi et al, 2008; Hentschel et al, 2005), and that neuropsychological assessments are a crucial tool for differential diagnosis (Gilman, et al. 2005; Oda, Yamamoto, & Maeda, 2009; Robottom & Weiner, 2009). Accurate differential diagnosis of memory problems is especially important when medical management strategies would change drastically as a result of increased diagnostic precision, as in the case of Lewy Body dementia (where antipsychotic medication is contraindicated to treat hallucinations), in frontotemporal dementia (where Donepezil could lead to symptomatic worsening; Mendez, Shapira, McMurtray, & Licht, 2007), in depression (where correct treatment is crucial to recovery), in normal aging (where no medication is needed), and in delirium (where there is a need to rapidly determine the underlying cause), among other examples.

A recent literature search produced more than 3000 peer-reviewed studies on neuropsychological functioning in dementia. In addition to the use of neuropsychological testing for assisting with differentiating normal aging from dementia, and aiding in differential diagnosis of dementia, it is also used to inform treatment planning and prognosis in established cases of dementia. For example, many prescribers utilize multiple memory medications (e.g. an acetylcholinesterase inhibitor and an NMDA-receptor antagonist) when dementia progresses from the mild to moderate and/or severe stage (Hermann & Lanctôt, 2011). Neuropsychological testing directly informs pharmacological management by providing statistically-based information to determine dementia severity. In addition, repeat neuropsychological testing is highly sensitive to detecting even subtle changes in cognitive functioning, and determining treatment response to memory medication, even in individuals with severe Alzheimer's disease (Cummings, et al, 2010). Further, differential diagnosis of dementia has been shown to be important to predicting functional abilities (Farias, Harrell, Neumann, & Houtz, 2003; Gure, et al, 2010; Razani et al, 2011), including medication management (Cosentino, Metcalfe, Cary, De Leon, & Karlawish, 2011).

2. Mild Cognitive Impairment (MCI)

MCI is differentiated from normal aging by the presence of abnormal, subtle cognitive deficits that may progress to dementia over time (Morgan & Ricker, 2008; Petersen, 2004; Sperling et al, 2011). Certain subtypes of MCI have a greater likelihood of progressing to dementia (Petersen, 2004), which makes early detection of MCI especially important for informing treatment and prognosis. Neuropsychological testing is especially important to detecting and diagnosing MCI, precisely because cognitive deficits are often mild and have not impacted daily functioning, and are thus generally not verifiable with other clinical methods (e.g. interview, neuroimaging). A recent literature search produced more than 375 peer-reviewed studies on neuropsychological functioning in MCI, with several finding that neuropsychological testing is particularly sensitive in discriminating between different MCI subtypes (Di Legge et al, 2010; Jak et al, 2009; Nordlund et al. 2007), determining different conversation rates to different types of dementia (Baars, 2009; Kim et al, 2010; Spaan & Dolan, 2010; Tabert et al, 2006), and detecting individuals with pre-MCI memory complaints ("subjective cognitive impairment") who progressed to MCI over time (Visser et al, 2009). The precision of neuropsychological testing in detecting MCI is highlighted in studies that have correlated neuropsychological testing results with hippocampal volumes (Visser et al, 2009), cerebral spinal fluid (Visser et al, 2009), MRI (Balthazar, Yasuda, Cendes, & Damasceno, 2010), and PET (Kim et al, 2010). Early detection of MCI impacts medical management by informing decisions about medication (e.g. increased treatment of vascular risk factors in MCI of vascular etiology; allowing patients and physicians to decide if they would like to start utilizing an anticholinergic medication), providing prognostic data, informing stroke risk (Jak et al, 2009), determining functional abilities (Triebel et al, 2009), and developing compensatory behavioral strategies to improve functional cognitive abilities.

3. Stroke

A recent literature search produced more than 1675 peer-reviewed studies on neuropsychological functioning after stroke. Post-stroke rehabilitation planning is strongly informed by neuropsychological assessment results, which provide detailed information about cognitive and functional abilities (Diller, 1992), inform rehabilitation treatments (Novak, 2010; Rohling, Faust, Beverly, & Demakis, 2009; Toniolo, 2011), and predict functional outcome (Al-Khindi, Macdonald, & Schweizer, 2010; Barker-Collo & Feigin, 2006; Devos et al, 2011; Feigin et al, 2008; Gottesman & Hillis, 2010; Leung et al, 2010; Wagle et al, 2011), even five years post-stroke (Barker-Collo et al, 2010).

4. Traumatic Brain Injury (TBI)

A recent literature search produced more than 1680 peer-reviewed studies on neuropsychological functioning and TBI. Neuropsychological assessment adds incremental value in predicting clinical outcome, beyond what can be ascertained on the basis of conventional medical variables (Hanks et al, 2008; Miller & Donders, 2003). There is robust evidence to suggest that neuropsychological status predicts functional improvement after TBI, and is an important variable in designing post-injury interventions (Bercaw, Hanks, Millis, & Gola, 2011; Dikmen Machamer, Powellj, & Temkin, 2003; Ehlardt et al, 2008; Kennedy et al, 2008; Lundqvist, Alinder, & Rönnberg 2008; Morris et al, 2006; Reid-Arndt, & Hinkebein, 2007). Some research shows that neuropsychological status is the most prominent factor in predicting functional recovery after TBI (Rassovsky et al, 2006), and is important in distinguishing the unique patterns of impairments that are exhibited by older adults after TBI (Goldstein & Levin, 1995; Stapert, Houx, De Kruijk, & Jolles, 2006).

5. Epilepsy

A recent literature search produced more than 1690 peer-reviewed studies on neuropsychological functioning and epilepsy. Neuropsychological assessment uniquely informs treatment planning for patients with epilepsy by mapping the location of cognitive functions to inform surgical decisions (Clusmann, 2008; Helmstaedter, 2004; Henry & Roman, 2011; Hermann et al., 2006), predicting post-surgical cognitive and functional outcome (Quiske et al, 2007; Sabsevitz, Swanson, Morris, Mueller, & Seidenberg, 2001), measuring post-surgical cognitive functioning (Graydon, Nunn, Polkey, & Morris, 2001; Sirven, Malamut, O'Connor, & Sperling 2000), and informing decisions about medication regimens by measuring the impact of antiepileptic medications on cognitive functioning (Loring, Marino, & Meador 2007; Martin et al, 2001).

6. Parkinson's disease

A recent literature search produced more than 1400 peer-reviewed studies on neuropsychological functioning and Parkinson's disease. Neuropsychological assessment uniquely informs treatment planning for patients with Parkinson's disease by measuring cognitive strengths and weaknesses (Flensborg, Shevlin, Borghammer, Larsen, & Ostergaard, 2011), predicting outcome in surgical patients (Bronstein et al, 2011; Okun et al, 2007; Trepanier, Kumar, Lozano, Lang, & Saint-Cyr, 2000), measuring post-surgical

cognitive outcomes (Fasano et al, 2010; Naskar, Sood, Goyal, & Dhara, 2010), and informing the use of medications and prognosis by differentiating between different syndromes that are characterized by symptoms of parkinsonism, but are not necessarily consistent with Parkinson's disease (e.g. lewy body dementia, Parkinson's-plus syndromes).

7. Other central nervous system disorders

There is a strong scientific basis for the use of neuropsychological testing to detect cognitive impairment and inform treatment planning in other central nervous system disorders including multiple sclerosis, Huntington's disease, hydrocephalus, amyotropic lateral sclerosis (ALS), brain tumors, and intracranial aneurysms, among many others. Neuropsychological assessment informs treatment planning by detecting subtle cognitive deficits that emerge prior to motor symptoms in Huntington's disease (Robins Wahlin, Lundin, & Dear, 2007), measuring post-surgical cognitive functioning in hydrocephalus (Duinkerke, Williams, Rigamonti, & Hillis, 2004), assessing cognitive impairment after encephalitis (Gustaw-Rothenberg, 2008), assisting in the identification of multiple sclerosis (Amato et al, 2008), and predicting functional outcome in multiple sclerosis (Kalmar, Gaudino, Moore, Halper, & DeLuca, 2008). Neuropsychological assessment also assists in predicting functioning and designing interventions for individuals with mental retardation and other intellectual disabilities (Masson, Dagnan, & Evans 2010), measuring the cognitive effects of surgical treatment in individuals with glioma (Talacchi, Santini, Savazzi, & Gerosa, 2011) and intracranial aneurysms (Towgood, Ogden, & Mee, 2004), and providing prognostic information in ALS (Elamin et al, 2011).

8. Noncentral nervous system medical conditions

Because cognitive dysfunction from a variety of medical conditions is increasingly an issue in the elderly, but still poorly recognized, especially in primary care, neuropsychological evaluations for such medical concerns are particularly critical and impact directly on the management of such patients (Cohen & Gunstad, 2010; Kalirao et al, 2011; Murray et al, 2006; Waldstein & Elias, 2001; Waldstein et al, 2010). There is a strong scientific basis for the use of neuropsychological testing to detect cognitive impairment and inform treatment planning in a variety of noncentral nervous system medical conditions, including acute respiratory distress, cancer, chronic kidney disease, chronic obstructive pulmonary disease, cardiac disorders, hypertension, obesity (bariatric surgical candidates), obstructive sleep apnea, and Type II diabetes (Gasquoine, 2011). A recent literature search produced more than 300 peer-reviewed studies on neuropsychological functioning in cardiac compromise. Neuropsychological assessments are utilized to inform treatment planning by quantifying cognitive compromise in patients with myocardial infarction (Antony, Jamuna, Kini, & Chakravarthy, 2010), ventricular ejection fraction (Jerskey et al, 2009), heart failure (Hoth, Poppas, Moser, Paul, & Cohen 2008; Ylikoski et al, 2000), cardiovascular disease (Waldstein & Wendell, 2010), moyamoya (Weinberg, Rahme, Aoun, Batjer, & Bendok, 2011), sickle cell disease (Edwards et al, 2007; Vichinsky et al, 2010), and decreased cardiac index (Lim, Alexander, LaFleche, Schnyer, & Verfaellie 2004), and to predict functional capacity in cardiovascular disease (McLennan, Mathias, Brennan, Russell, & Stewart 2010) and heart failure (Alosco et al, 2011). Neuropsychological assessment also informs treatment

planning by quantifying cognitive compromise in pulmonary disease (Arez-Fegyveres, Kairalla, Carvalho, & Nitrini 2010; Sachdev et al, 2006) and hepatic encephalopathy (Randolph et al, 2009), classifying disease progression in lupus (Kozora, Ellison, & West 2004), predicting functional level in HIV (Gorman, Foley, Ettenhofer, Hinkin, & van Gorp, 2009; Scott et al, 2011), and predicting medication adherence and functional abilities following kidney transplant (Gelb, Shapiro, & Thorton, 2010). Neuropsychological assessment provides a sensitive measure of cognitive impairment in individuals with glucose abnormalities that are subthreshold for Type II diabetes (Messier, Tsiakas, Gagnon, & Desrochers 2010) and individuals with diabetes (Zihl, Shaaf, & Zillmer 2010), and predicts functional limitations in diabetes (Knopman, Mosley, Catellier, & Coker 2009). Neuropsychological testing is also useful in measuring post-operative cognitive dysfunction (Steinmetz, Christensen, Lund, Lohse, & Rasmussen, 2009).

9. Psychiatric Disorders

Neuropsychological deficits are a cardinal symptom in many so-called "functional" disorders, such as schizophrenia, bipolar disorder, and depression, and are often a direct result of brain changes related to such disorders. The nature and severity of neuropsychological dysfunction (e.g., impaired reasoning or communication, lack of insight, distractibility and impulsivity, problems with memory or planning) varies among individuals with major psychiatric disorders. Physicians often refer patients for neuropsychological testing in order to understand the nature and severity of the patients' problems with cognitive dysfunction, as this information can be used to guide medical decision making about the patients' needs for various levels of supervision vs. abilities for self-care and self-direction. Medical management is often guided by information about the patients' neuropsychological status regardless of their legally defined "competence." Neuropsychological assessment predicts functioning for individuals with psychiatric disorders such as schizophrenia (Eack, Pogue-Geile, Greenwald, Hogarty, & Keshavan, 2010; Shrivastava, Johnston, Shah, Thakar, & Stitt, 2011), bipolar disorder (Bearden, Woogen, & Glahn, 2010; Depp et al, 2008; Martino, Igoa, Marengo, Scápola, & Strejilevich, 2011), and depression (Mackin & Arean, 2009).

VI. CPT codes 96101 – 96125

96101	Psychological testing (includes psychodiagnostic assessment of emotionality, intellectual abilities, personality and psychopathology, eg, MMPI, Rorshach, WAIS), per hour of the psychologist's or physician's time, both face-to-face time administering tests to the patient and time interpreting these test results and preparing the report
96102	Psychological testing (includes psychodiagnostic assessment of emotionality, intellectual abilities, personality and psychopathology, eg MMPI and WAIS), administered with qualified health care professional, interpretation and report, administered by technician, per hour of technician time, face-to-face.
96103	Psychological testing (includes psychodiagnostic assessment of emotionality, intellectual abilities, personality and psychopathologic, eg. MMPI) administered by a computer, with qualified health care professional, interpretation and report.

96105	Assessment of aphasia (includes assessment of expressive and receptive speech and language function, language comprehension, speech production ability, reading, spelling, writing, eg, by Boston Diagnostic Aphasia Examination) with interpretation and report, per hour
96110	Developmental testing; limited (eg, Developmental Screening Test II, Early Language Milestone Screen), with interpretation and report.
96111	Extended (including assessment of motor, language, social, adaptive and/or cognitive functioning by standardized developmental instruments) with interpretation and report
96116	Neurobehavioral status exam (clinical assessment of thinking, reasoning and judgment, eg acquired knowledge, attention, language, memory, planning and problem solving, visual spatial abilities), per hour of the psychologist's or physician's time, both face-to-face time with the patient and time interpreting test results and preparing the report.
96118	Neuropsychological testing (eg, Halstead-Reitan Neuropsychological Battery, Wechsler Memory Scales and Wisconsin Card Sorting Test), per hour of the psychologist's or physician's time, both face-to-face time administering tests to the patient and time interpreting these test results and preparing the report
96119	Neuropsychological testing (ie, Halsted-Reitan neuropsychological Battery, Wechsler Memory Scales and Wisconsin Card Sorting Test), with qualified Health care professional interpretation and report, administered by technician, per hour of technician time, face-to face.
96120	Neuropsychological testing (eg, Wisconsin Card Sorting test), administered by a computer, with qualified health care professional interpretation and report.
96125	Standardized cognitive performance testing (eg, Ross information processing added assessment) per hour of a qualified health care professional's time, both face-to-face time administering tests to the patient and time interpreting these test results and preparing the report

<u>CPT Code Equivalents of the most common components of the neuropsychological assessment</u>

The most commonly used CPT codes for neuropsychological assessment are 96118, 96119, and 96120. A minimum of 31 minutes must be provided to report one hour of service. Services 96116 and 96118 are documented as (a) time spent face-to-face with the patient and (b) the time spent integrating and preparing the report. CPT code equivalents of the most common components of the neuropsychological assessment include:

- Direct clinical observation and interview with the patient, often with caregivers or significant others who serve as sources of information that the patient may be unable to provide (e.g., spouse, parent, adult child, care staff, therapists), 96116;
- Review of medical records and, in some cases, other relevant records (e.g., work history, educational history, criminal or social services records, etc.), 96118;

- Completion of forms and questionnaires by the patient and significant others (not billable);
- Selection, administration and interpretation of neuropsychological tests, directly by the neuropsychologist (96118); or by a technician under the neuropsychologist's direct supervision (96119), or by computerized test administration (96120), or via some combination of these three approaches to test administration;
- Integration of neuropsychological test findings, across tests, and with information from history, observation, questionnaire, and interview, by the neuropsychologist (96118);
- Formulation of the differential diagnoses, diagnostic conclusions, prognosis, and treatment recommendations, by the neuropsychologist (96118);
- Provision of a feedback or treatment planning conference to the patient, with significant others as needed, to explain the test procedures, results, implications, conclusions, recommendations, and follow-through as needed (96118);
- Preparation and provision of a written report to the patient and referring health care provider, and to other treatment providers with written informed consent to release information signed by the patient (96118).

Code 96119 is report for test administration by a technician who is hired, trained, and directly supervised by a practitioner licensed by the State to provide neuropsychological testing:

> …During testing, the qualified health professional frequently checks with the technician to monitors the patient’s performance and make any necessary modifications to the test battery or assessment plan. When all tests have been administered, the qualified health professional meets with the patient again to answer any questions (AMA CPT Assistant, November 2006).

Code 96120 is reported for computer-administered neuropsychological testing, with subsequent interpretation and report of the specific tests by the physician, psychologist, or other qualified health care professional. This should be reserved for situations where the computerized testing is unassisted by a provider or technician other than the installation of programs/test and checking to be sure that the patient is able to complete the tests. If greater levels of interaction are required, though the test may be computer administered, then the appropriate provider cods (96118) or technician code (96119) should be used (AMA CPT Assistant, November 2006).

It is not unusual that the assessments may include testing by a technician and a computer with interpretation and report by the physician, psychologist or qualified health professional. Therefore, it is appropriate in such cases to report all 3 codes in the family of ... 96118-96120. (AMA CPT Assistant, November 2006; CMS Medline, June 2008).

Typically, the neuropsychological evaluation requires 4-9 hours to perform, including administration, scoring, interpretation, and report writing. If the evaluation is performed over several days, the time should be combined and reported all on the last day of service.

Notes related to CPT codes 96101-96125:

Medicare Part B coverage of psychological tests and neuropsychological tests is authorized under section 1861(s)(3) of the Social Security Act. Payment for psychological and neuropsychological tests is authorized under section 1842(b)(2)(A) of the Social Security Act. The payment amounts for the new psychological and neuropsychological tests (CPT codes 96102, 96103, 96119 and 96120) that are effective January 1, 2006, and are billed for tests administered by a technician or a computer reflect a site of service payment differential for the facility and non-facility settings. Additionally, there is no authorization for payment for diagnostic tests when performed on an "incident to" basis. (Pub. 100-02 Transmittal: 85; Rev. 85, Issued: 02-29-08, Effective: 01-01-06, Implementation: 12-28-06)

a. Payment for Diagnostic Psychological and Neuropsychological Tests

Expenses for diagnostic psychological and neuropsychological tests are not subject to the outpatient mental health treatment limitation, that is, the payment limitation on treatment services for mental, psychoneurotic and personality disorders as authorized under Section 1833(c) of the Act. The payment amount for the new psychological and neuropsychological tests (CPT codes 96102, 96103, 96119 and 96120) that are billed for tests performed by a technician or a computer reflect a site of service payment differential for the facility and non-facility settings. CPs, NPs, CNSs and PAs are required by law to accept assigned payment for psychological and neuropsychological tests. However, while IPPs are not required by law to accept assigned payment for these tests, they must report the name and address of the physician who ordered the test on the claim form when billing for tests.

b. **CPT Codes for Diagnostic Psychological and Neuropsychological Tests**

CPT codes 96101, 96102, 96103, 96105, 96110, and 96111 are appropriate for use when billing for psychological tests. CPT codes 96116, 96118, 96119 and 96120 are appropriate for use when billing for neuropsychological tests. All of the tests under this CPT code range 96101-96120 are indicated as active codes under the physician fee schedule database and are covered if medically necessary.

c. **Payment and Billing Guidelines for Psychological and Neuropsychological Tests**

The technician and computer CPT codes for psychological and neuropsychological tests include practice expense, malpractice expense and professional work relative value units. Accordingly, CPT psychological test code 96101 should not be paid when billed for the same tests or services performed under psychological test codes 96102 or

96103. CPT neuropsychological test code 96118 should not be paid when billed for the same tests or services performed under neuropsychological test codes 96119 or 96120. However, CPT codes 96101 and 96118 can be paid separately when billed on the same date of service for different and separate tests from 96102, 96103, 96119 and 96120. When the psychologist performs a nonredundant test that is billed under the 96118 code using the -59 modifier, time spent for the integration of those test results with results from other sources, including tests performed by a technician, is billed using the 96118 code.Under the physician fee schedule, there is no payment for services performed by students or trainees if those students or trainees are also supported by GME funds, federal grants, or other sources of support that are included in government supported training programs. Accordingly, Medicare does not pay for services represented by CPT codes 96102 and 96119 when performed by a student or a trainee supported by federal funds. However, the presence of a student or a trainee while the test is being administered does not prevent a physician, CP, IPP, NP, CNS or PA from performing and being paid for the psychological test under 96102 or the neuropsychological test under 96119. Payment for students/trainees that are not supported by federal funds is subject to the relevant medical necessity and supervision rules.

d. Payment and Billing Guidelines for Psychological and Neuropsychological Tests

Occupational therapists and speech language pathologists uses CPT code 96125 when they perform tests on patients who have compromised functioning abilities due to acute neurological events such as traumatic brain injury or cerebrovascular accident (CVA) and must undergo assessment to determine if function abilities such as orientation, memory and high-level language function have been compromised and to what extent. For psychological and neuropsychological testing by a physician or psychologist, see 96101-96103, 96118-96120.

e. Reading of the report is included in the office time or floor time in the hospital and, is not considered a separate service when performed by the treating provider.

f. CPT code 96101, 96102, 96105, 96110, 96111, 96116, 96118 or 96119, is reported as one unit per hour. If 30 - 1 hr of time is spent performing the test, interpretation and report one unit of time should be billed. If the psychological testing, interpretation and report takes less than 30 minutes, the definition of the CPT code has not been met and the testing may not be billed.

4. CPT codes 96101, 96118 and 96125

a. CPT codes 96101, 96118 and 96125 are used to bill, in hourly units, the provider's time both face-to-face with the patient and the time spent interpreting test results and preparing the report.

b. The codes may not used to bill for the interpretation of tests administered by a technician or computer. For codes 96102, 96103, 96119 and 96120 (e.g., MMPI, WAIS, etc.) "professional interpretation and report" means the analyzing of the data provided by the singular test (e.g., MMPI) by the professional (i.e., not the technician) and the documentation of that analysis in a written format by the professional (i.e., not the technician). For example, the singular interpretation that a test score is "normal" or otherwise falls outside the normal range is included in the CPT Code.

c. When a provider performs some tests and a technician or computer performs other tests, documentation must demonstrate medical necessity for all tests. The provider time spent on the interpretation of the tests performed by the technician/computer may be added to the units billed under CPT code 96101 or 96118. For codes 96101 and 96118 "interpreting tests results and preparing the report" means the analyzing and integrating of the data provided by multiple tests (e.g., versus one single test) and the further integration of that analysis with information obtained from the interviews, record review and/or behavioral observations by the professional. In addition, this integration of multiple sources of information by the professional is documented by that professional in a written format. The major differences is that for codes 96102, 96103, 96119 and 96120, the interpretation is for one test where for codes 96101 and 96118, the interpretation and documentation of multiple tests and the integration of that interpretation with other sources of information.

d. Medicare will not pay twice for the same test or the interpretation of tests.

5. CPT codes 96102, 96119

a. CPT codes 96102 and 96119 include both the face-to-face technician time and the qualified health care provider's time for the interpretation and report.
b. The provider who interprets the report must be available to furnish assistance and direction to the technician administering the test.
c. Add the time the provider spends interpreting and reporting the test to the time technician spends administrating the tests.

6. CPT codes 96103, 96120

a. CPT codes 96103 and 96120 describe tests administered by a computer and the interpretation and report performed by a qualified health care professional.

b. Billed one service regardless of the number of tests taken by the patient
c. The provider who interprets the report must be available during the time the patient is taking the test.
d. The interpretation of the test is included in the codes and is not separately billable.
e. These codes may not be billed for scoring of tests

Testing: General Issues

a. When performed by a provider in the context of a psychiatric assessment, procedures such as the Minnesota Multiphasic Personality Inventory 2 (MMPI-2) or rating scales (e.g., the Hamilton Depression Rating Scale) should be reported as CPT code 96101. If these measures are utilized in the context of a neuropsychological assessment, the applicable neuropsychology CPT code should be reported (96118, 96119, 96120).
b. The Folstein Mini Mental Status Exam, in isolation, should not be classified separately as neuropsychological testing since it is typically part of a more general clinical exam.
c. Medicare payment for the test includes the test and the report. Feedback about test results to the beneficiary should include interpretation and explanation of the results in accordance with ethical principles of the American Psychological Association (APA). This should be billed with the 96118 code, though the 90887 code can be used if results are explained to family members or other responsible persons.
d. When a provider and a technician administer different medically necessary tests, the interpretation must be allocated to the appropriate CPT code. Computerized tests are billed once (96120) and include the interpretation and report.
e. Typically, the total time for all tests (regardless who performs them) will be several hours including administration, scoring and interpretation/integration of data from multiple sources. If the testing is done over several days, the testing time should be combined and reported on the last date of service. If the testing time exceeds 9 hours, to determine the medical necessity for the extended testing, a copy of the test report may be requested.

VII. ICD-9 Codes

Given that neuropsychological assessments are often requested to diagnose a cognitive disorder, and by definition some of the assessment procedures will yield negative results, referring physicians should not be required to provide a neuropsychological diagnosis prior to making a referral for neuropsychological testing. ICD-9 codes for neuropsychological testing should include pre-surgical evaluations, a code for negative findings (i.e. no cognitive dysfunction), codes for cognitive impairment secondary to medical conditions or primary neurologic disorders, and a code for Cognitive Disorder NOS. ICD-9 codes for neuropsychological assessment should be listed separately from the ICD-9 codes for psychiatric diagnoses in order to clarify that neuropsychological

testing is typically performed in the context of an identified or suspected medical condition, versus a primary psychiatric condition

ICD-9 Codes that Support Medical Necessity
Any ICD-9CM Code that is consistent with the indications of coverage is acceptable.

ICD-9 Codes that DO NOT Support Medical Necessity
ICD-9CM Codes that are inconsistent with the indications of coverage are not acceptable.

List of ICD-9 codes appropriate for coverage (not comprehensive)

Infectious and parasitic diseases (001–139)
006.5 Amoebic brain abcess
013 Tuberculosis of meninges and CNS
042-044 HIV
045-049 Poliomyelitis and other non-arthropod-borne viral diseases of the CNS
054.3 Herpetic meningoencephalitis
088.81 Lyme disease
094 Neurosyphilis

Neoplasms (140–239)
191 Malignant neoplasm of the brain
192 Malignant neoplasm of other and unspecified parts of the nervous system
225 Benign neoplasm of the brain and other parts of the nervous system
237 Neoplasm of uncertain behavior of endocrine glands and nervous system (includes Neurofibromatosis)

Endocrine, nutritional and metabolic diseases, and immunity disorders (240–279)
242.9 Hyperthyroidism, NOS
243-244 Hypothyroidism
249 Secondary Diabetes
250 Diabetes
251.2 Hypoglycemia
252 Hyper/Hypoparathyroidsm
265.1 Wernicke's
266.2 B12 deficiency
270.1 PKU
272.0 Hypercholesterolemia
275.1 Wilson's disease
277.0 Cystic Fibrosis (consent for lung transplant surgery)
277.7 Metabolic syndrome
277.8 Other specified disorders of metabolism

Diseases of the blood and blood-forming organs (280–289)
282.6 Sickle Cell anemia (because of risk for silent/no symptom stroke)

Mental Disorders 290-319

290.0 Senile dementia uncomplicated
290.1 Presenile dementia
290.10 Presenile dementia uncomplicated
290.11 Presenile dementia with delirium
290.12 Presenile dementia with delusional features
290.13 Presenile dementia with depressive features
290.2 Senile dementia with delusional or depressive features
290.20 Senile dementia with delusional features
290.21 Senile dementia with depressive features
290.3 Senile dementia with delirium
290.4 Vascular dementia
290.40 Vascular dementia uncomplicated
290.41 Vascular dementia with delirium
290.42 Vascular dementia with delusions
290.43 Vascular dementia with depressed mood
290.8 Other specified senile psychotic conditions
290.9 Unspecified senile psychotic condition
291.1 Alcohol-induced persisting amnestic disorder
291.2 Alcohol-induced persisting dementia
292.82 Drug induced persisting dementia
292.82 Other specified drug induced persisting mental disorders
292.9 Unspecified drug induced persisting mental disorders
293.0 Delirium
294.0 Amnestic disorder in conditions classified elsewhere
294.1 Dementia in conditions classified elsewhere
294.10 Dementia in conditions classified elsewhere without behavioral disturbance
294.11 Dementia in conditions classified elsewhere with behavioral disturbance
294.8 Other persistent mental disorders due to conditions classified elsewhere
294.9 Unspecified persistent mental disorders due to conditions classified elsewhere
(disturbances in the mental process related to thinking, reasoning, and judgment)
295 Schizophrenic disorders
296 Episodic mood disorders (depression, mania, bipolar)
299.0 Autistic disorder
299.00 Autistic disorder current or active state
299.01 Autistic disorder residual state
299.1 Childhood disintegrative disorder
299.10 Childhood disintegrative disorder current or active state
299.11 Childhood disintegrative disorder residual state
299.8 Other specified pervasive developmental disorders
299.80 Other specified pervasive developmental disorders current or active state
299.81 Other specified pervasive developmental disorders residual state
299.9 Unspecified pervasive developmental disorder
299.90 Unspecified pervasive developmental disorder current or active state
299.91 Unspecified pervasive developmental disorder residual state
300 Neurotic disorders (anxiety, panic, GAD, conversion, phobia, OCD, somataform)

303 Alcohol Dependence Syndrome
304 Drug Dependence
306.1 Anorexia Nervosa (cognitive deficits from malnutrion)
309 Adjustment reaction
310 Specific nonpsychotic mental disorders following organic brain damage (frontal lobe syndrome, post-concussion syndrome)
311 Depressive disorder NOS
314.0 Attention deficit disorder of childhood
314.00 Attention deficit disorder of childhood without hyperactivity
314.01 Attention deficit disorder of childhood with hyperactivity
314.1 Hyperkinesis of childhood with developmental delay
314.2 Hyperkinetic conduct disorder of childhood
314.8 Other specified manifestations of hyperkinetic syndrome of childhood
314.9 Unspecified hyperkinetic syndrome of childhood
315 Specific delays in development
315.0 Developmental reading disorder
315.1 Developmental mathematics disorder
315.2 Other specific developmental learning difficulties
315.3 Developmental speech or language disorder
315.31 Expressive language disorder
315.32 Mixed receptive-expressive language disorder
315.5 Mixed development disorder
315.8 Other specified delays in development
315.9 Learning disability/developmental delay, NOS
317-319 Mental Retardation

Diseases Of The Central Nervous System 320-327
320 Bacterial meningitis
321 Meningitis due to other organisms
322 Meningitis of unspecified cause
323 Encephalitis myelitis and encephalomyelitis
324 Intracranial and intraspinal abscess
325 Phlebitis and thrombophlebitis of intracranial venous sinuses
326 Late effects of intracranial abscess or pyogenic infection
327 Organic sleep disorders

Hereditary And Degenerative Diseases Of The Central Nervous System 330-337
330 Cerebral degenerations usually manifest in childhood
331 Other cerebral degenerations
332 Parkinson's disease
333 Other extrapyramidal disease and abnormal movement disorders
334 Spinocerebellar disease
335 Anterior horn cell disease

Other Disorders Of The Central Nervous System 340-349
340 Multiple sclerosis

341 Other demyelinating diseases of central nervous system
342 Hemiplegia and hemiparesis
343 Infantile cerebral palsy
344 Other paralytic syndromes
345 Epilepsy
346 Migraine
347 Cataplexy and narcolepsy
348 Other conditions of brain
349 Other and unspecified disorders of the nervous system
349.82 Toxic encephalopathy

Diseases of the circulatory system (390–459)
430 Subarachnoid hemorrhage
431 Intracerebral hemorrhage
432 Other and unspecified intracranial hemorrhage
434 Occlusion of cerebral arteries (cerebral thrombosis/embolism with cerebral infarction)
435 Transient cerebral ischemia (TIA)
437.2 Hypertensive encephalopathy
437.5 Moyamoya disease
437.7 Transient global amnesia
438 Late effects of cerebrovascular disease

Diseases of the musculoskeletal system and connective tissue (710–739)
710 Systemic lupus erythematosus

Congential Anomalies 740-759
740 Anencephalus and similar anomalies
741 Spina bifida
742 Other congenital anomalies of nervous system
758 Chromosomal anomalies
759 Other and unspecified congenital anomalies

Certain conditions originating in the perinatal period (760–779)
760.71 Fetal alcohol syndrome

Symptoms, signs, and ill-defined conditions (780–799)
780.1 Hallucinations
780.93 Memory loss
780.97 Altered mental status
781.8 Neurologic neglect syndrome
784.5 Dysarthria

Injury and Poisoning 800-999
800-804 Fracture Of Skull
850-854 Intracranial Injury, Excluding Those With Skull Fracture
870-879 Open Wound Of Head, Neck, And Trunk
905-909 Late Effects Of Injuries, Poisonings, Toxic Effects, And Other External Causes
958-959 Certain Traumatic Complications And Unspecified Injuries
960-979 Poisoning By Drugs, Medicinals And Biological Substances
980-989 Toxic Effects Of Substances Chiefly Nonmedicinal As To Source
996-999 Complications Of Surgical And Medical Care, Not Elsewhere Classified

Persons Without Reported Diagnosis Encountered During Examination And Investigation Of Individuals And Populations V70-V82
V70 General medical examination
V79 Special screening for mental disorders and developmental handicaps

Special screening for neurological eye and ear diseases V80
V80 Special screening for neurological eye and ear diseases
V80.0 Screening for neurological conditions
V80.01 Special screening for traumatic brain injury
V80.09 Special screening for other neurological conditions

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