

NEUROPSYCHOLOGY TODAY

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May 2009 Issue – Child Neuropsychology: Learning Disabilities

Learning Disabilities (LDs): Definition & Overview

About 8-10% children (more boys than girls) have one or more learning disability (LD), which may impact their academic and general adaptive functioning.¹ Below are some key facts about LDs:

- LD is a neurobiological disorder of cognitive and/or language processing caused by abnormalities in the cerebral cortex of the brain
- LDs do not reflect overall intelligence; rather, they affect children's information acquisition and processing and their ability to perform some specific cognitive tasks
- LD presents as a serious difficulty with reading, writing, speaking, or arithmetic that is unexpected, given the child's intellectual ability
- LDs are different from mental or physical disabilities, but they may occur together with various emotional or medical conditions
- LDs include dyslexia (reading disability), dyscalculia (math disability), dysgraphia (hand-writing disability), information-processing disorders, and language disorders

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Diagnosis, Prognosis, & Treatment of LDs

Diagnosis: A delay in achieving developmental milestones related to language, motor, or social functioning is one of the early signs of LD. However, LDs cannot be diagnosed on the basis of physical exam, neurological findings, IQ tests, or parental and teacher reports. It is essential that a neuropsychologist specializing in LDs does a full neuropsychological (NP) evaluation to diagnose LD or another cognitive disorder.¹

Neuropsychologists use state-of-the-art objective clinical tools to evaluate each aspect of a child's neurocognitive functioning and pinpoint the specific cognitive deficits that may be indicative of a LD, as well as their severity. Based on the objective NP test results, developmental and medical history, and other relevant data the neuropsychologist diagnoses

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Comorbidity & Causes of LDs

Comorbidity: It is possible that LD is only one of the manifestations of underlying abnormalities in the structure and neurological wiring of the brain, since about half of all children with LDs have another neuropsychiatric disorder. Almost 50% of children with a seizure disorder, and 60% of children with Tourette's disorder have cognitive deficits and suffer from a LD. Additionally, there is an approximately 30% overlap between ADHD and dyslexia. Another common comorbid diagnosis is Developmental Coordination Disorder. Emotional difficulties such as anxiety and depression are also frequently found in children with LDs. These issues may stem from both the neuro-biological abnormalities in the brain and psychosocial problems secondary to LDs.^{1,3}

Causes: Many LDs are inherited, since up to 45% of family members of individuals with reading disorder have the same LD.¹ Additionally, the studies show that nearly 100% of identical twin pairs share dyslexia, as opposed to only 34% of fraternal (non-identical) twins.³

LDs may also be acquired due to problems during mother's pregnancy or at birth. LDs have been linked to mothers' smoking, substance use, or malnutrition during pregnancy, exposure to neurotoxins (lead, pesticides, etc.), as well as complications during birth.^{1,3}

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- If children display neuro-cognitive deficits and specific learning problems, they may receive diagnoses of LD and Cognitive Disorder NOS
- LDs are only considered disabilities if they interfere significantly with the children’s academic and adaptive functioning
- Children with LDs perform more poorly in school and are less likely to graduate from high school^{1,2,3}

LDs and other cognitive disorders prevent many children from acquiring the academic knowledge that they are expected to master at each grade-level. This is especially significant because academic instruction in schools builds on previously presented material. The longer the children’s LDs remain unrecognized or untreated, the harder it may be for them to catch up with their peers in their level of academic achievement.^{2,3,4}

Importantly, LDs do not only interfere with the children’s academic performance, but may also have consequences in other contexts, including their family and social functioning. For example, certain LDs are characterized by perceptual deficits, and a child may misunderstand or misinterpret facial expression, body language, or verbal cues of others leading to awkward social interactions. In addition, children with LDs are more likely to be ridiculed and bullied by their classmates or other children. Coupled with academic failure, social problems place these children at a higher risk of social isolation, emotional problems (e.g., anxiety and depression), becoming involved with tobacco, alcohol, and drugs, and dropping out of school.^{2,3,4}

Brain Abnormalities in LDs

For decades, researchers have hypothesized that LDs result from the underlying brain abnormalities; however, only recently the advances in technology provided empirical support for this notion.³

Research shows that many children with nonverbal LDs have damaged, underdeveloped, or dysfunctional white matter regions of the brain.⁵ Also, dyslexia has been linked to abnormalities in the size and function of the left hemisphere, which is involved in language processing; to lower brain activation during auditory processing (see image on p.3); and to smaller corpus callosum. Notably, each individual with LD presents with a unique pattern of brain abnormalities. These findings confirm that LDs are rooted in neurobiological functioning and structure of the brain.³

LDs & the School System

Individuals with Disabilities Education Improvement Act (IDEA) of 2004 ensures that public schools address the unique needs of children with disabilities, allowing them to meet the developmental and achievement goals established for all children.⁶

Schools must evaluate, monitor, and provide accommodations and services to children with disabilities while retaining them within regular classrooms to the maximum extent possible. For each child with a disability, schools must develop Individualized Educational Program (IEP) that is revised annually and includes the specific academic, developmental, and functional goals, and the accommodations or services that are needed to reach those goals.⁶

Usually schools employ school psychologists who are qualified to administer and interpret intelligence (IQ) and academic

achievement tests. However, these tests provide only IQ and a grade level of academic knowledge, but do not provide a diagnosis and sufficient information about brain functioning and LD to plan proper and the most targeted treatment.²

NP exam provides a full study of cognitive deficits involved in LDs. It assesses not only IQ and academic skills, but also sensory motor, visuo-perceptual, visuo-spatial, reasoning, attention, auditory-linguistic processing, memory, and other functions. Completion of NP exam in a clinical setting outside the school may be a medical necessity for children with LDs.²

About Dr. Rimma Danov

Dr. Rimma Danov received her PhD in clinical psychology from Adelphi University in NY. She completed her internship in clinical psychology and neuropsychology at Harvard Medical School and postdoctoral fellowship in pediatric and adult neuropsychology in a private clinic affiliated with NJ Medical School and the Robert Wood Johnson Medical Center. She is an assistant clinical professor at NYU School of Medicine, Dept. of Neurology, Penn State University, Dept. of Kinesiology, and Adelphi University, Derner Institute. In the past, she worked as a neuropsychologist for the NJ Devils Hockey Team and was engaged as a co-investigator of TBI in boxers at the NYS Athletic Commission.

Presently, Dr. Danov maintains a full-time private neuropsychology practice where she examines neurocognitive and neurobehavioral functioning of patients 2-90 years of age with various neurological and neuropsychiatric disorders, such as MS, TBI, CVA, Parkinson’s, Alzheimer’s, dementia, ADHD, PDD, Autism, learning disabilities, seizures, and many others, using state-of-the-art neuropsychological techniques. Dr. Danov also conducts and publishes research in these areas. She is available for medico-legal consultations and testimony.

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a child and prepares a NP report. This report also provides recommendations of how to address the cognitive disorder, both within the school and home settings. Parents may chose to utilize a NP report as supporting evidence to request certain accommodations and services for their child at school.²

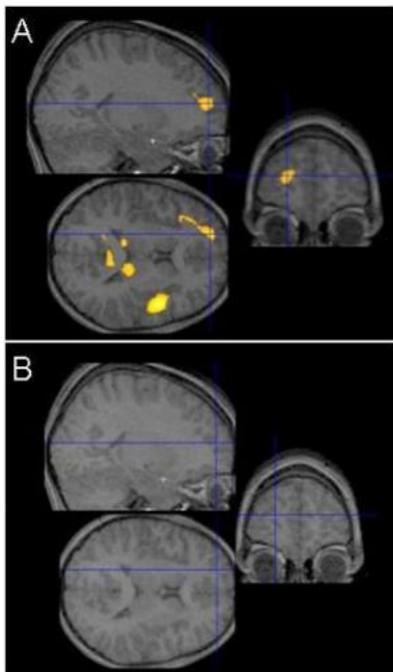
Importantly, in addition to uncovering neurocognitive deficits and weaknesses, a full NP exam identifies cognitive strengths. The neuropsychologist provides the parents and the children with the information about how these relative strengths can be utilized to to compensate for cognitive deficits. This emphasis on the child's strengths may not only improve his or her academic, social, and family functioning, but also result in increased self-confidence and self-esteem.²

Annual follow-up NP exams are recommended in order to monitor the severity and progression of neurocognitive deficits that cause learning problems. The results of follow-up exams are also useful for the assessment of the effectiveness of treatment and/or services that had been utilized, and their possible revision.²

Differential diagnosis: People are born with LDs, a lifelong condition. LDs do not increase in number with time, and do not suddenly appear in children without a history of learning difficulties. However, an existing LD may be exacerbated by family problems, psychological trauma, malnutrition, substance abuse, or emotional problems.¹ Cognitive disorder, on another hand, can progress as a result of ongoing medical condition, such as epilepsy, AVM or MS, among others.

If a child suddenly exhibits learning difficulties, it may be a sign of a serious medical/neurological condition (tumor, stroke, unusual blood vessel growth, traumatic brain injury, etc). Numerous tests, including NP exam, are done to determine if this is the case. If learning problems occur due to a serious medical or neurological issue, the child does not receive a LD diagnosis.¹

Prognosis: Because LD is caused by the underlying brain structure abnormalities, this condition persists into adulthood. However, with the acquisition of various compensatory strategies, children may learn to cope with their LD and minimize its effects on their daily functioning. The extent of LD's impact on a individuals' functioning depends on the type, number, and severity of LDs, the person's general intellectual ability, and the overlapping emotional and medical conditions.¹



An example of brain abnormalities in LD: MRI shows that non-dyslexic children's brain (A) is much more activated when listening to the fast-changing sounds than the dyslexic children's brain (B).

Treatment: Because LDs result from brain abnormalities, there is currently no cure for LDs. The most common treatment for children with LDs is special education and tutoring, which involves teaching children learning skills by building on their abilities and strengths while correcting and compensating for their disabilities and weaknesses. In many cases, such specialists as speech-language and occupational therapists are involved in treatment. Also, medication may be used to enhance attention/ concentration. Early screening and intervention from qualified specialists are essential in preventing or diminishing learning difficulties and other LD-related problems.^{1,3,4}

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1. Background image (pp.1,4): Jeff Johnson Biolog. & Medic. Visuals
2. Child image (p.1): idea.ed.gov
3. MRI image (p.3): Children's Hospital Boston, sciencedaily.com

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Next Issues- June'09: Parkinson's Disease; July'09: Seizure Disorders

We take the following insurance plans:

Aetna	HIP
Americhoice	Magnacare
Amerigroup	Medicare
BCBS	MHN
Cigna	Multiplan
Elderplan	No-Fault
Fidelis	Tricare
First Health	UHC/Oxford
HealthNet	Workers' Comp
Health Plus	1199

Case dependent:

Affinity	GHI HMO
Atlantis	Health First

Each insurance carrier determines the medical necessity of every requested neuropsychological exam differently. Our billing staff determines whether the exam will be covered by the insurance before the exam

begins and works very hard to obtain an authorization, if needed. If you have questions about a plan that is not listed here, contact our office to find out whether we can obtain an authorization or have recently joined that plan.

Languages

We are very much open to diverse cultures in this practice and value the quality of a bilingual neuropsychological exam performed in the patient's native language. Dr. Danov is a native Russian speaker. Her current clinical staff include native **Russian, Spanish** and **Hebrew** speakers.

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