



# The ABCs and 123s of LDs

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Board Certified in Clinical Neuropsychology

Specializing in understanding brain-behavior relationships  
and evidence-based interventions for those with special  
medical, emotional, behavioral, and educational needs



# Background and Disclosures

- Board certified in Clinical Neuropsychology
- Licensed psychologist
- Clinical child psychologist
- Individual, family, school, medical, community
  - Board Member of CARE and member of ACHIEVE Task Force for those with FASD
  - Advisory Member of Wayne State Developmental Disability Council
  - State Advisory Committee for Michigan's Autism Plan
- Current Positions/Appointments
  - Senior Staff, Henry Ford Health System (Neuropsychology, Center for Autism and Developmental Disabilities)
  - Professor of Psychology Madonna University
  - Assistant Professor of Psychiatry, Wayne State University
  - Owner, Director Great Minds of Michigan, Rochester Hills



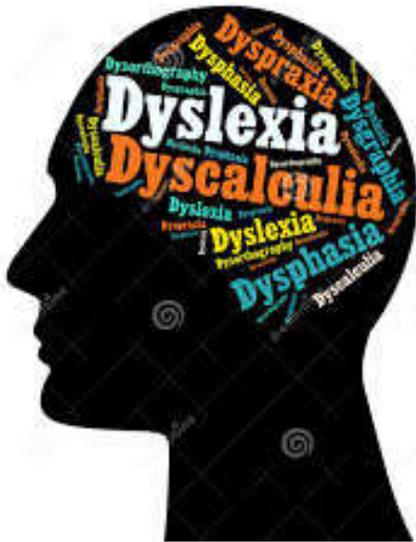
## Philosophy of Care

- Individualized but holistic
- Symptom-based
- Evidence-based
- Cognitive, behavioral and systems
- Medication as a supplement
- Maximizing potential based on needs and resources

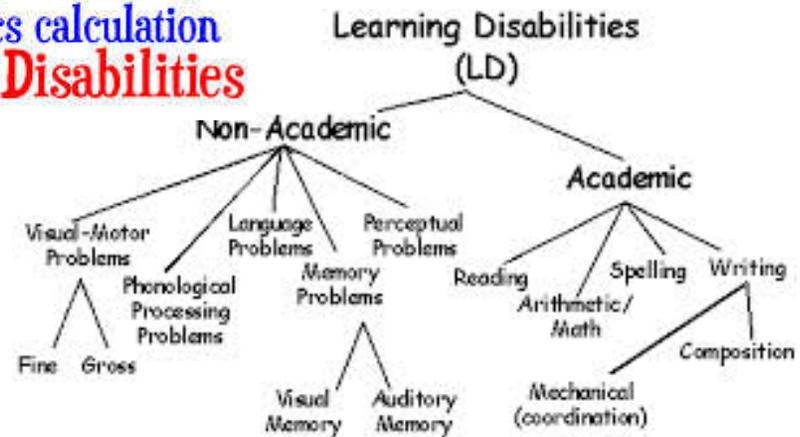


# Goals

- Definitions of Learning Disabilities
- Describe Specific Types of Learning Disabilities
- Risk Factors and Associated Problems
- Identify Evidence-Based Interventions
- Summarize Methods of Diagnosing Learning Disabilities



Dysgraphia  
 Aphasia  
 reading fluency  
 oral expression  
 listening comprehension  
 Dyscalculia  
**Dyslexia**  
 reading comprehension  
 mathematics problem solving  
 mathematics calculation  
 Learning Disabilities





## Problems with Learning v. Learning Disability

- Non-native speakers
- Sensory impairments
- Lack of exposure
- Intellectual Disabilities
- Emotional and Behavioral Difficulties
- Neurological Disorders
- Birth trauma
- Exposure to toxins
- Autism
- Genetic disorders
- Seizures, tumors, brain injury



**DIS-Ability?**





# What IS a Learning Disability?

- Research
- Educational/Legal (PL 94-142 Law IDEA; Section 504 of the ADA)
- Medical
- Problems in learning NOT explained by intelligence, lack of education, hearing or visual impairment
- ACHIEVEMENT is *substantially* below ABILITY
  - Ability is average or better
  - Achievement in one or more areas is *significantly* lower
  - Clinical (patterns, processes) v. Discrepancy



# National Center on Learning Disabilities

- Learning disabilities are **NOT** the same as **intellectual disabilities** (formerly known as mental retardation), **sensory impairments** (vision or hearing) or **autism spectrum disorders**.
- People with LD are of **average or above-average intelligence** but still struggle to acquire skills that impact their performance in school, at home, in the community and in the workplace.
- Learning disabilities are **lifelong**, and the sooner they are recognized and identified, the sooner steps can be taken to circumvent or overcome the challenges they present.

Learning disabilities can affect a person's ability in the areas of:

1. Listening
2. Speaking
3. Reading
4. Writing
5. Spelling
6. Reasoning
7. Mathematics

<http://www.ncld.org/types-learning-disabilities/what-is-ld/what-are-learning-disabilities>



# Medical Definition

- Specific Learning Disorder
  - Diagnostic and Statistical Manual of Mental Disorders, 5<sup>th</sup> Edition, American Psychiatric Association
  - not consistent with the person's chronological age, educational opportunities, or intellectual abilities



## **DYS - ?**

*Badly, ill*

**-lexia**

*Word, Reading*

**-calculia**

*Calculate*

**-graphia**

*Draw, write*

**-praxia**

*Movement*



## Research/Clinical Definition

- Developmental Dyslexia (reading processes)
  - Dysphonetic
  - Dyseidetic
  - Mixed
- Developmental Dysgraphia (writing)
- Developmental Dyscalculia (arithmetic calculation)
- Developmental Dyspraxia (motor)



# Dyslexia



- Language-based
  - Alphabetic skills
  - Decoding, phonologic awareness
  - Sight word reading
  - Fluency
  - Listening
  - Comprehension
- Affects all skills and subjects requiring reading



# What is Dyslexia Like?

<http://www.youtube.com/watch?v=zafiGBrFkRM>





# Reading Comprehension

- Verbal working memory
- Attention
- <http://www.pbs.org/wgbh/misunderstoodminds/reading.html>



# Dyscalculia

- Automaticity, problems with math facts
- Slow calculation
- Ineffective math reasoning
- Development of math skills
  - Numeration, math facts
  - Calculation
  - Fluency





# Dysgraphia



- Handwriting legibility
- Grammar, sentence structure, punctuation
- Fluency
- Spelling
- Vocabulary
- Production
- Organization



# What are the Warning Signs?

- Shaywitz' myths
  - <http://dyslexia.yale.edu/Myths.html>
- Apparent attention problems
  - Not following instructions
  - Not finishing tests or assignments
  - Not responding to questions accurately
  - Slowed thinking/processing



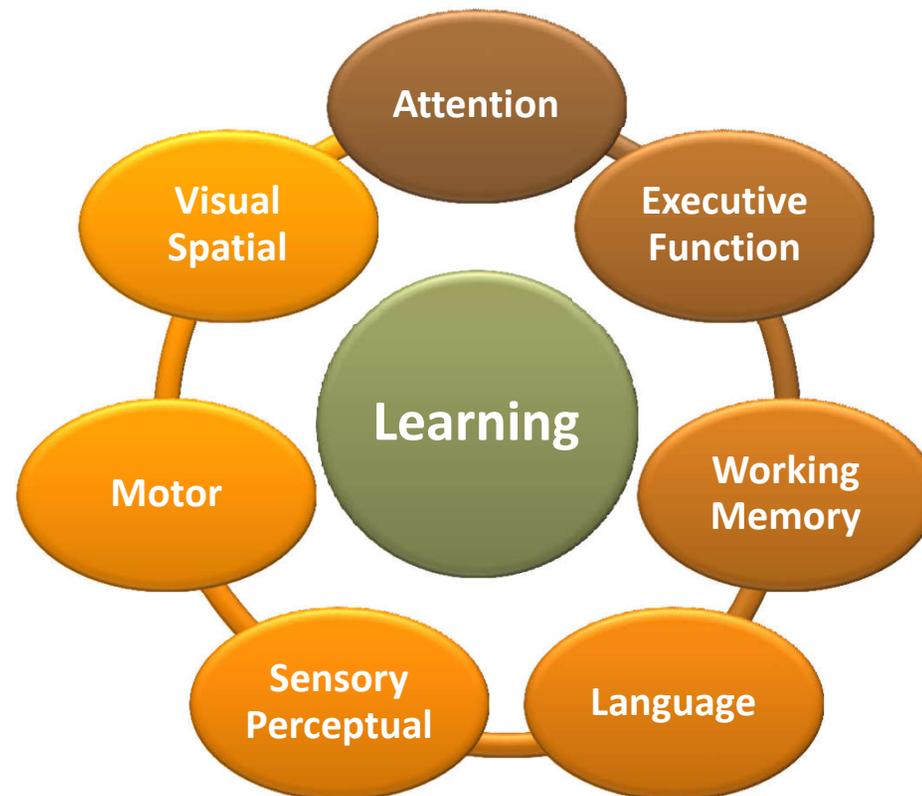
# Those At-Risk for Learning Disabilities

- Medical conditions
  - ADHD
  - Prematurity/low birth weight
  - Jaundice
  - Early ear tube placement
  - Chronic conductive hearing loss
  - Prenatal exposures
- Family history of learning disabilities
- Chromosomal/genetic disorders
  - William Syndrome
  - Turner/Klinefelter Syndrome



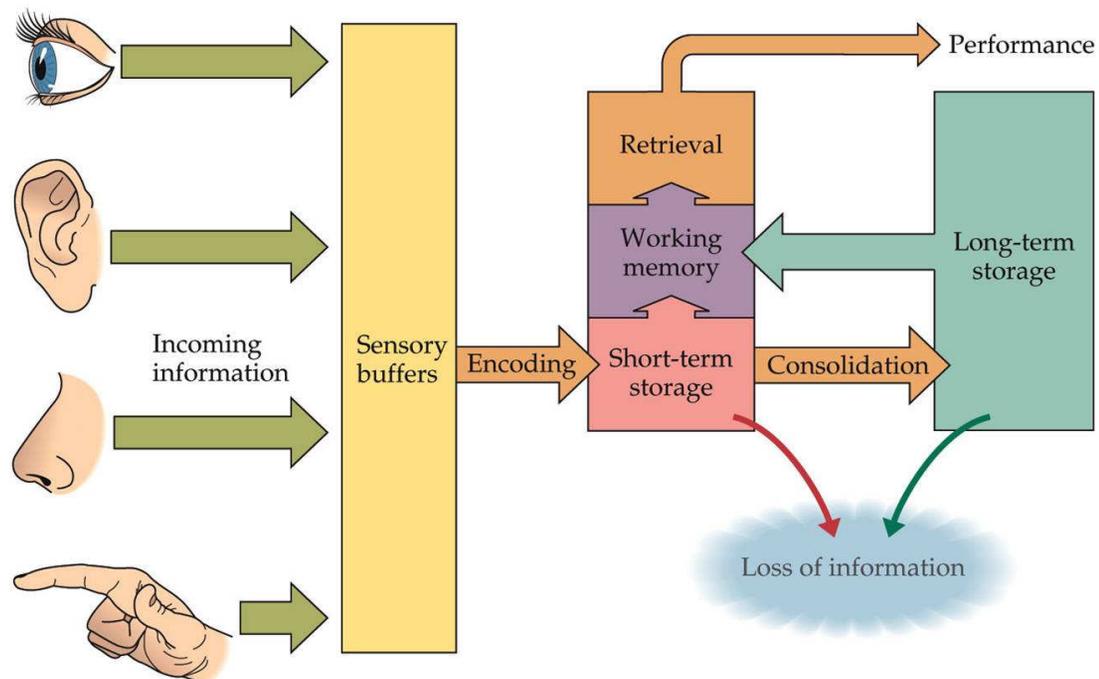


# Cognitive Processes Involved in Learning





# Encoding, Consolidation, Retention, Storage and Retrieval





## Underlying Deficits in Reading

teapot tɛpɔt  
təpɔt tɛpɔt  
tɛpɔt tɛpɔt  
tɛbɔt tɛpɔt  
təpɔt tɛpɔt

- Speech
- Language comprehension and expression
- Word retrieval, speed
- Attention
- Working Memory



## Underlying Deficits in Math

- Visual-spatial
- Organizational
- Graphomotor
- Attention
- Working Memory

$$50 + 3 = 80$$

$$46 - 28 = 22$$

$$49 + 1 = 59$$

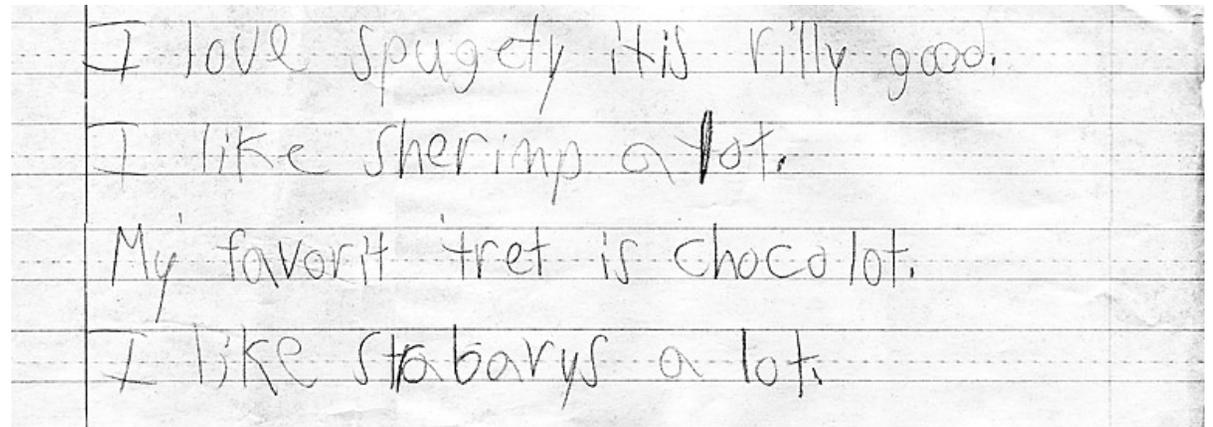
$$60 - 1 = 50$$

$$79 > 80$$



# Underlying Deficit in Writing

- Graphomotor
- Language
- Memory
- Organization
- Reasoning





## What are the Challenges?

- Early identification
- Early intervention
- Expertise
- Resources





## At What Age Can Learning Disabilities be Identified?

- Third grade
- Early signs of delays can be evident
- There appear to be critical stages
  - Early developmental of skills
  - Onset of alphabetic or numeracy skills
  - Development of word reading from phonetics rather than memory
  - Need for speed and comprehension



# What if I Think My Child Has A Learning Disability?

- Obtain information from school
  - Grades
  - Standardized test scores (MEAP, Stanford Achievement tests)
- Rule out and address other problems
  - Attention problems and other medical/neurologic, emotional, or behavioral difficulties
- Obtain evaluation of intellectual, achievement, working memory, executive function, processing, language, motor, visual-perceptual skills

# The importance of neuropsychological assessment for the evaluation of childhood learning disorders NAN Policy and Planning Committee

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## Abstract

When children experience learning difficulties, an appropriate evaluation of abilities and skills can provide the foundation for an accurate diagnosis and useful recommendations. When comprehensive information about a child's brain-related strengths and weaknesses is necessary to understand potential sources of the problem and implications for functioning, a neuropsychological evaluation is most often the best choice. This paper was written to help parents, educators, health care providers, and third-party payors to understand the nature of neuropsychological assessment and to choose the type of evaluation that will furnish relevant information for the child's educational planning.

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# When to Evaluate

- Initial diagnosis
- Problems are worsening
- Limited benefit from current treatment
- Advocacy or Independent Educational Evaluation
- Documentation
  - Change in placement
  - Junior high school, High school
  - College entrance examination accommodations



# What Can be Done About Learning Disabilities ?

- Medication
- Intervention
  - Remediation of underlying skills
- Accommodations
- Adaptive Technology
- Legal Protections
  - IDEA
    - Entry into special services
    - Interventions
    - Accommodations
  - Section 504 ADA



## Other Considerations

- Social competence
- Socioemotional functioning
- Behavioral functioning



# Evidence-Based Strategies and Programs

- Reading
  - Explicit instruction in phonological awareness
  - Small group, guided oral reading
  - Alphabetic skills, phonemic awareness, decoding, fluency, vocabulary, comprehension
  - Stepping Stones to Reading
  - Daisy Quest
  - Story Mapping
  - Earobics
  - Multisensory programs
    - Orton-Gillingham
    - Lindamood-Bell (Lindamood Phonemic Sequencing)



# Math

- Sequential direct instruction
  - Use of manipulatives
  - Mnemonic strategies
  - Self-monitoring and performance feedback
- Number concepts and meaning, spatial sense, computation
- Reciprocal peer tutoring
- I CAN Learn Pre-Algebra, Algebra
- Saxon Middle School Math
- University of Chicago School Mathematics Project Algebra
- Mathematics Recovery
- Number Worlds
- Round the Rug Math



# Writing

- Motor
- Occupational therapy
- Phonemic awareness, spelling
- Direct instruction in organization, story mapping
- Language fluency, expressive language



# Language

- Speech/Language Therapy
- Explicit instruction and phonological processing
- Fast ForWord



# Working Memory

- Cogmed



# Accommodations

- Standard Accommodations
- Presentation
- Format
- Setting
- School, entrance exams, college, work



*"If you worry that receiving extra help will make your child feel different, forget it. Your child already feels different by virtue of what he can and cannot do."*