

**Adolescent and Adult  
Outcomes in Learning and  
Attention Disorders:  
Research Findings and Practical Strategies  
for Success**

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And

Cindy Dupuy, PhD

# Main Points

- Developmental learning and attention disorders have a basis in brain functioning.
- These disorders are more likely than not to persist into adolescence and adulthood.
- Treatments are available that reduce symptoms and normalize brain functioning.
- Accommodations are available to reduce impact in education and the workplace.

Teens/Adults with  
Learning Disability

Teens/Adults with  
AD/HD

Strategies for Success

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graph TD; A[Teens/Adults with Learning Disability] --> C[Strategies for Success]; B[Teens/Adults with AD/HD] --> C;
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# General Outline

## ■ Learning Disability

- Definition and Terminology
- Neurodevelopmental Foundations
- Persistence into Adolescence/Adulthood
- Neural Changes with Intervention

## ■ AD/HD

- Definition and Subtypes
- Neurodevelopmental Foundations
- Persistence into Adolescence/Adulthood
- Multi-modal Treatment
- Co-Morbidities
- Psychosocial Outcomes

## U.S. Office of Education (1977)

- The term "specific learning disability" means a disorder in one or more of the basic psychological processes involved in **understanding or in using language**, spoken or written, which may manifest itself in an imperfect ability to **listen, speak, read, write, spell, or to do mathematical calculations**. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning disabilities which are primarily the result of visual, hearing, or motor handicaps, or mental retardation, or emotional disturbance, or of environmental, cultural, or economic disadvantage.
- (United States Office of Education. (1977). Definition and criteria for defining students as learning disabled. Federal Register, 42:250, p. 65083. Washington, DC: U.S. Government Printing Office.)

# Washington State Definition of Specific Learning Disability

- **WAC 392-172-126 Definition and eligibility for specific learning disability.** (1) Specific learning disability is a disorder in one or more of the basic psychological processes involved in **understanding or using spoken or written language** that may manifest itself in an imperfect ability to **listen, think, speak, read, write, spell, or to do mathematical calculations**, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.  
  
(2) Specific learning disability does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

# The Interagency Committee on Learning Disabilities National Institutes of Health (1987)

- Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in **acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills**. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairment, mental retardation, **social and emotional disturbance**), with socio-environmental influences (e.g., cultural differences, insufficient or inappropriate instruction, psychogenic factors), and especially **attention deficit disorder**, all of which may cause learning problems, **a learning disability is not the direct result of those conditions or influences.**

## National Joint Committee on Learning Disabilities

- Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the **acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities**. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. **Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability**. Although learning disabilities may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences.
- (National Joint Committee on Learning Disabilities. (1988). Collective perspectives on issues affecting learning disabilities: Position papers and statements. Austin, TX: PRO-ED.)



## Rehabilitation Services Administration (1985)

- A specific learning disability is a disorder in one or more of the central nervous system processes involved in **perceiving, understanding, and/or using concepts through verbal (spoken or written) language or nonverbal means**. This disorder manifests itself with a deficit in one or more of the following areas: **attention, reasoning, processing, memory, communication, reading, writing, spelling, calculation, coordination, social competence, and emotional maturity**.
- (Rehabilitation Services Administration. (1985, January 24). Program policy directive. Washington, DC: U.S. Office of Special Education and Rehabilitation Services.)

# Learning Disabilities: Terminology

- Educational
- State of WA – Special Education Law
- Specific Learning Disability
  - Basic Reading/Comprehension
  - Math Calculation/Reasoning
  - Written Expression/Language
  - Oral Expression/Comprehension
- Medical ICD 9
  - Developmental Dyslexia
  - Developmental Dyscalculia
  - Developmental Dysgraphia
  - Developmental Dysphasia
- Mental Health DSM IV
  - Reading Disorder
  - Mathematics Disorder
  - Disorder of Written Expression
  - Learning Disorder – NOS
  - Receptive Expressive Language Disorders

# General Concepts in Learning Disability

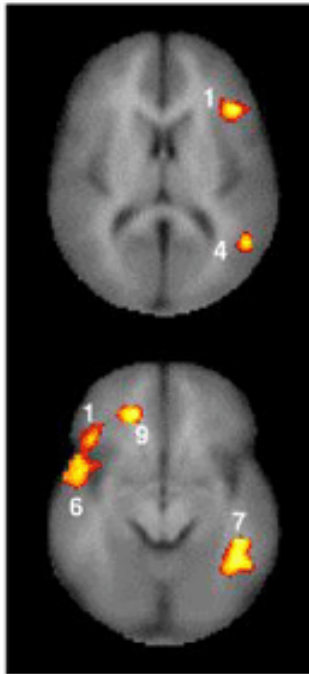
- Language-based Learning Disabilities are the most common types of LD
- Language-based Learning Disabilities range in severity
  - At least severe - may only affect reading fluency/spelling
  - At most severe – impact all academic areas and oral language
- At the level of diagnosis and treatment, each person should be assessed for individual patterns of strength/deficit
- Learning Disabilities affecting math and social skills (NLD) will not be a focus of this talk, but are also important.

During magnetic resonance (MRI) scan, a narrow table moves the patient through a tunnel-like structure which creates a magnetic field through which radio waves are sent, creating a 3-D image of the internal structures

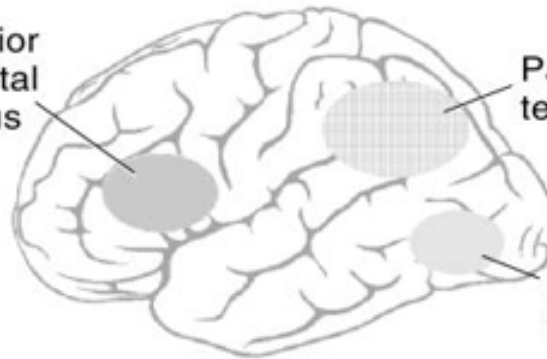


# Functional Neuroimaging During Reading: Non-Impaired and Dyslexic Readers

NI vs DYS



Inferior Frontal Gyrus



Parieto-temporal

Occipito-temporal

Copyright S. Shaywitz, M.D.

# A Developmental Perspective

Age of Onset of the Skill

Level of Skill Development

Rate of Skill Acquisition

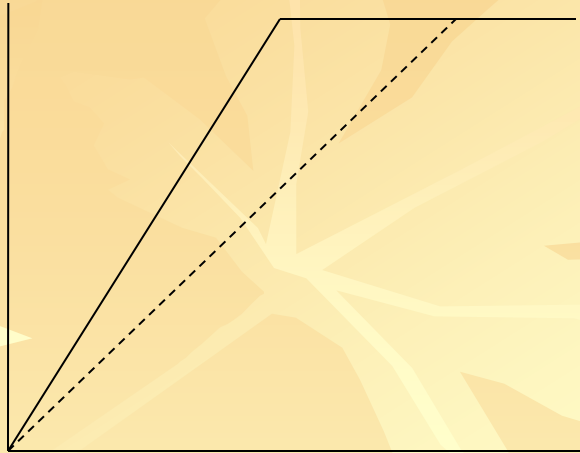
Assumes:

1. Initial zero point where all are equal
2. Maximum level (100%)

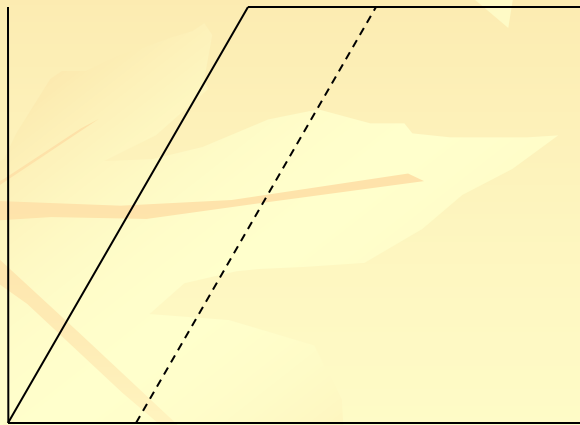
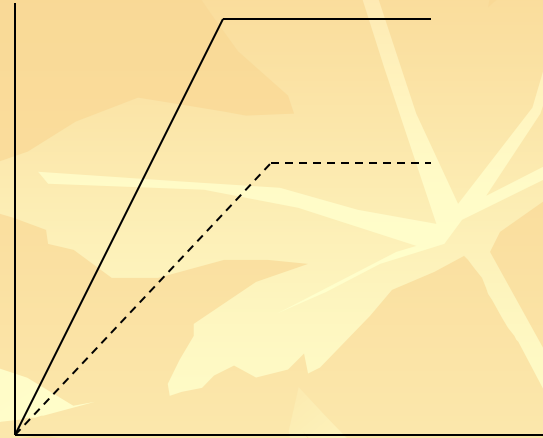
# Types of Developmental Outcomes

- **Lag** – Performance difference that recedes at a later time when both groups reach 100%.
- **Deficit** – Performance difference that persists when both groups are at their maximum level.
- -----
- **Delay** – The onset of the skill occurs later in one group than the other.
- **Rate** – After onset, the change in skill acquisition over time is different.

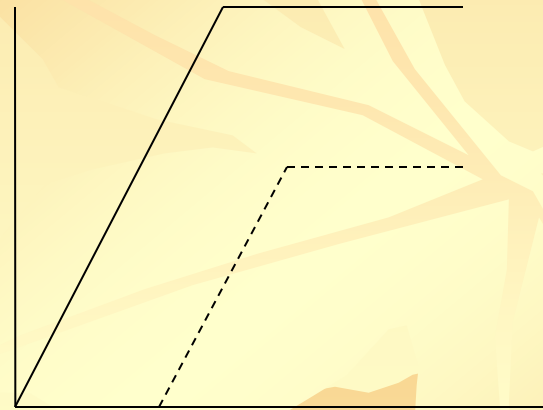
Lag-Rate



Deficit-Rate



Lag-Delay

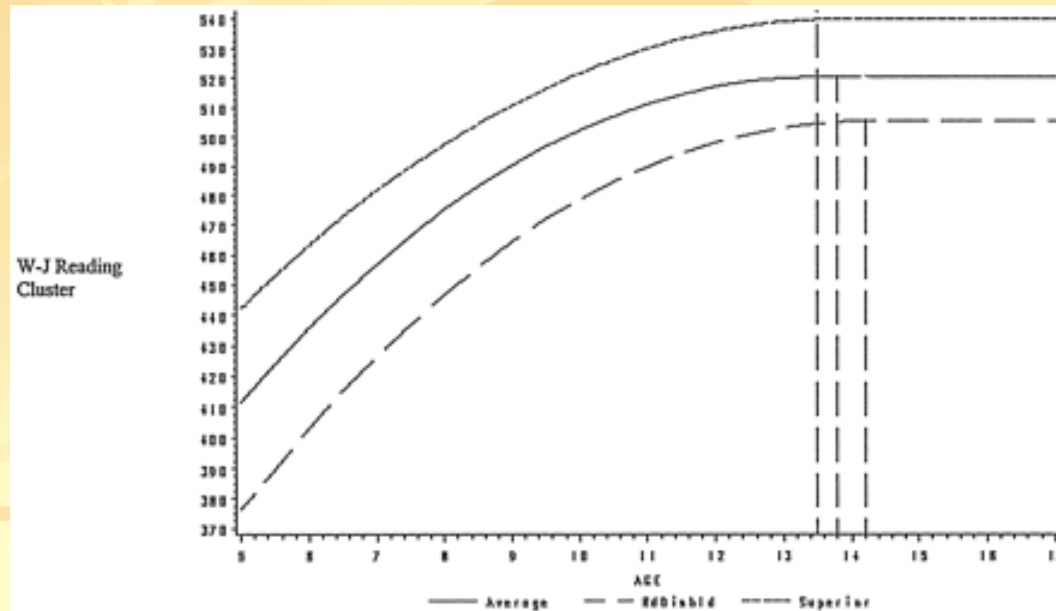


Deficit-Delay



## Persistence of Dyslexia: The Connecticut Longitudinal Study at Adolescence

Sally E. Shaywitz, MD\*, Jack M. Fletcher, PhD<sup>§</sup>, John M. Holahan, PhD\*, Abigail E. Shneider, MA\*, Karen E. Marchione, MA\*, Karla K. Stuebing, PhD<sup>§</sup>, David J. Francis, PhD, Kenneth R. Pugh\*,<sup>¶</sup> and Bennett A. Shaywitz, MD\*



# Persistence of Dyslexia: 9<sup>th</sup> Grade Outcomes

- All readers demonstrated growth to a plateau
- Dyslexics remained behind average readers at 9<sup>th</sup> grade – did not “catch up” – Deficit-Delay.
- Phonological processing deficits continued to predict:
  - Basic reading
  - Reading rate
  - Spelling
- Basic reading skills best predictor of reading comprehension, followed by IQ and SES

# Persistence of Dyslexia: 12<sup>th</sup> Grade Outcomes

- Dyslexics:
  - Were less likely to be on target for graduation
  - Were less likely to plan to graduate from high school
  - Had lower grade point averages
  - Read less often than average or superior readers
- Dyslexics did not differ from other readers in presence of:
  - Legal problems
  - Alcohol/tobacco use
  - Conduct or attention problems

# Reading Tasks in Dyslexia

- 11 Normal Readers (mean age = 11.6)
  - Scanned twice (3.6 month interval)
- 10 Dyslexics (mean age = 11.5)
  - Underwent intensive 3-week reading remediation program
  - Scanned before and after treatment (1.9 month interval)

Study conducted at the University of Washington Learning Disability Center

VW Berninger, TL Richards, EH Aylward et al

## Two fMRI scans

1. Phoneme Mapping: associating letters or letter combinations with sounds
  - On: Match phonemes in a pair of words
  - Off: Match letter strings

The background of the image features a repeating pattern of stylized, overlapping leaves in various shades of yellow and orange, creating a warm, autumnal atmosphere. The leaves are rendered in a flat, graphic style with visible veins.

pleek

greal



xzqy

xzyq

## Phoneme Mapping

- On task requires
  - visual processing of letters
  - attention to letter position
  - phonological decoding
  - decision and motor response
- Off task requires
  - visual processing of letters
  - attention to letter position
  - decision and motor response



## Two fMRI scans

### 2. Morpheme Mapping: associating derivational suffixes with meaning

- On: Determine whether one word is derived from (“comes from”) another word
- Off: Determine whether words are synonyms



builder

build

The background of the image is a light beige or cream color, overlaid with a pattern of stylized, overlapping leaf shapes. The leaves are rendered in various shades of yellow and light brown, creating a textured, organic feel. The leaves are scattered across the frame, with some appearing more prominent than others.

**corner**

**corn**

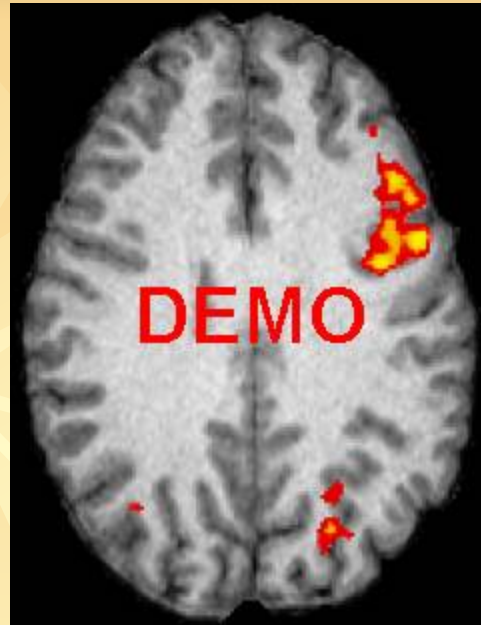
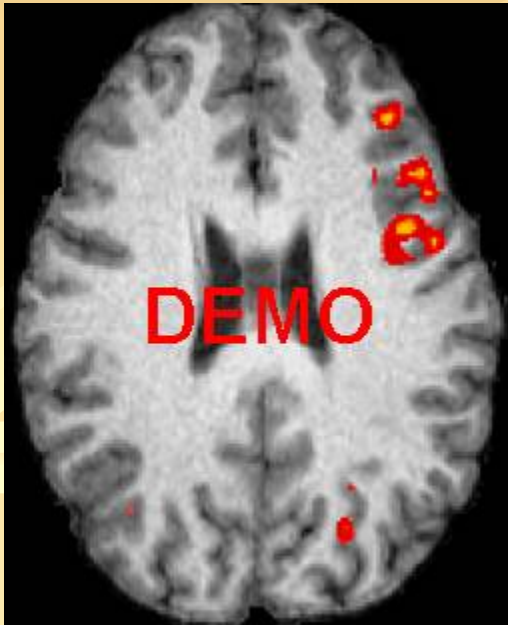


**baby**

**infant**

# Morpheme Mapping

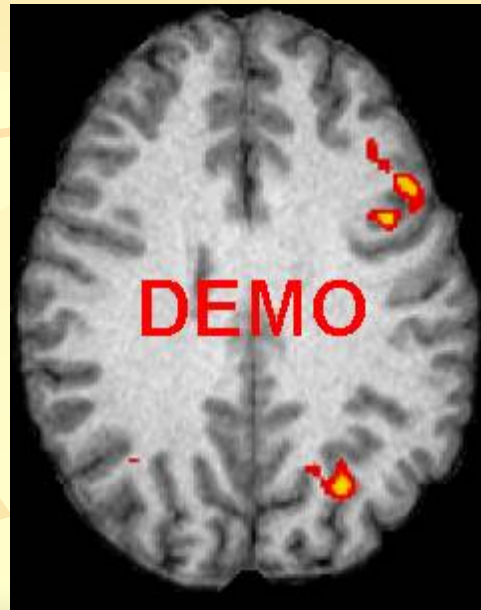
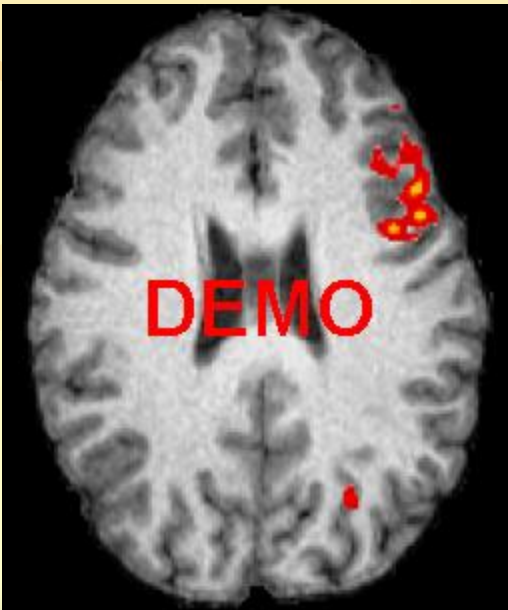
- On task requires
  - Visual and auditory attention to words
  - Judgment regarding derivational suffix and semantic judgment
  - Motor response
- Off task requires
  - Visual and auditory attention to words
  - Semantic judgment
  - Motor response



Controls at **Time 1**  
On Phoneme  
Mapping

N = 11

Interval ~ 3 months



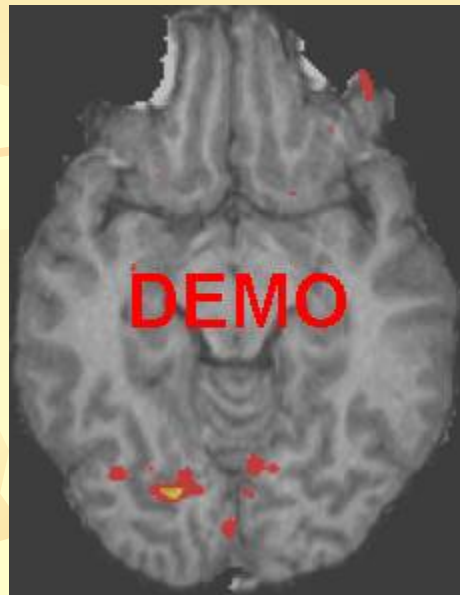
Controls at **Time 2**  
On Phoneme  
Mapping



Controls at **Time 1**  
On Morpheme  
Mapping

N = 11

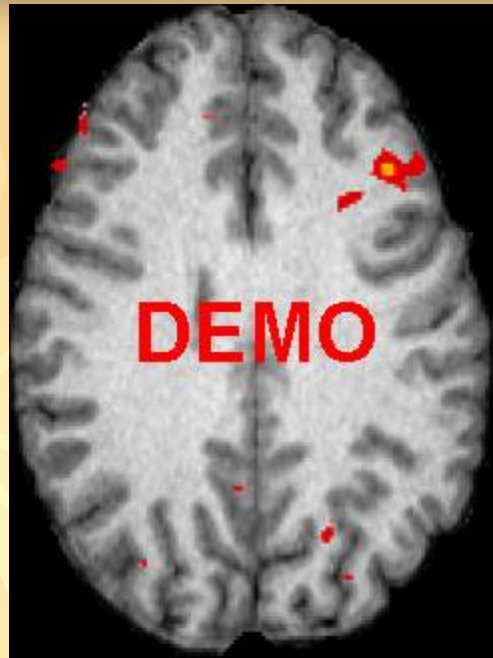
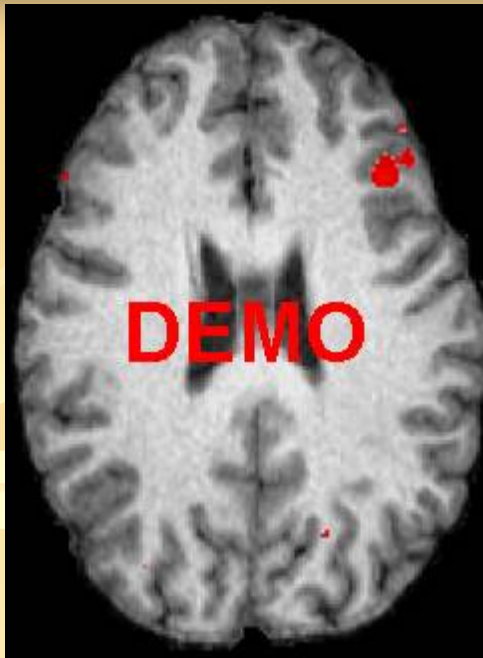
Interval ~ 3 months



Controls at **Time 2**  
On Morpheme  
Mapping

- Results for Controls only indicate:
  - Same areas of activation for initial and follow-up scan
  - Level of activation about the same at follow-up scan as at initial scan for Morpheme Mapping, but less at follow-up scan than at initial scan for Phoneme Mapping

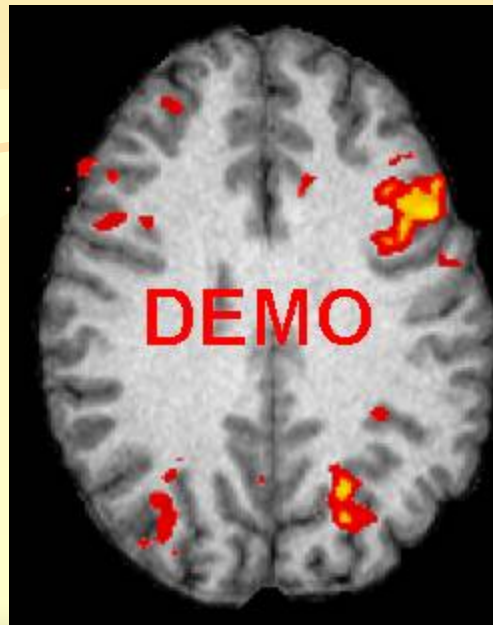




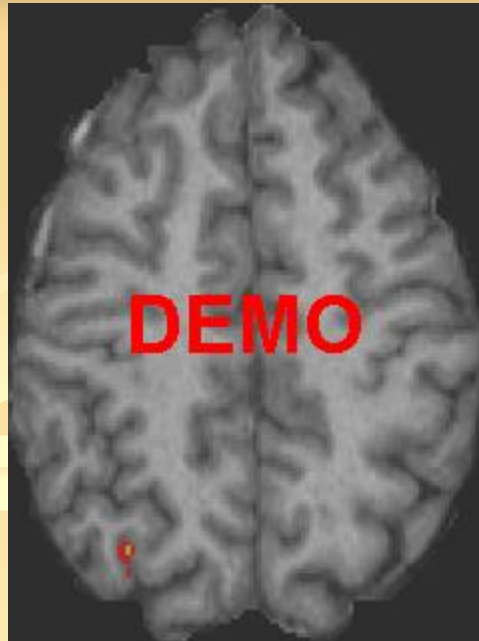
Dyslexic Subjects  
**Before Treatment**  
**(Time 1)** On  
Phoneme Mapping

N = 10

Interval ~ 2 months

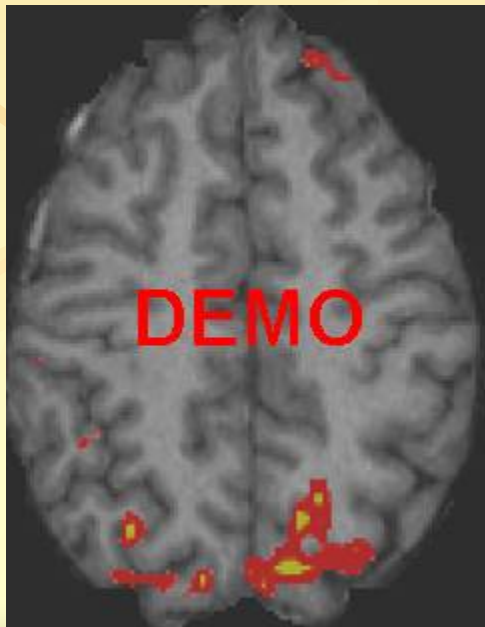


Dyslexic Subjects  
**After Treatment**  
**(Time 2)** On  
Phoneme Mapping



Dyslexic Subjects  
**Before Treatment**  
**(Time 1)** On  
Morpheme Mapping

N = 10  
Interval ~ 2 months

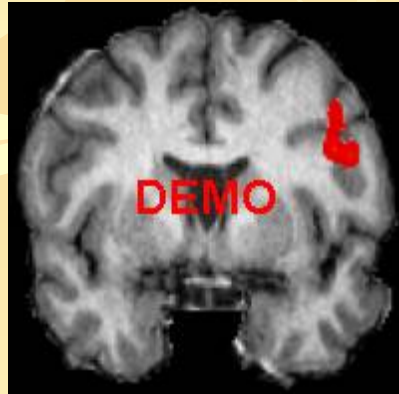


Dyslexic Subjects  
**After Treatment**  
**(Time 2)** On  
Morpheme Mapping

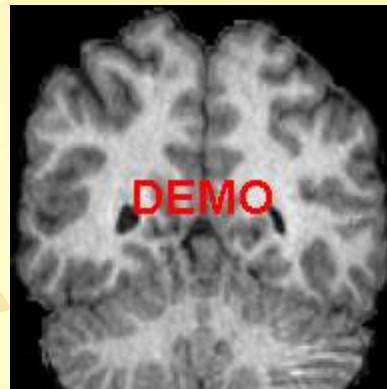
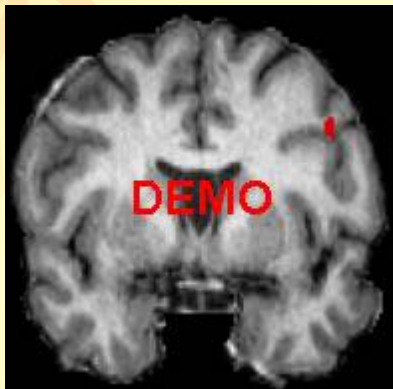
- Results for Dyslexic subjects only indicate:
  - Level of activation greater after treatment than before treatment for both tasks
  - Some regions activated after treatment that were not activated before treatment

# Phoneme Mapping

**Initial scan:** Areas where control subjects showed greater activation than dyslexics

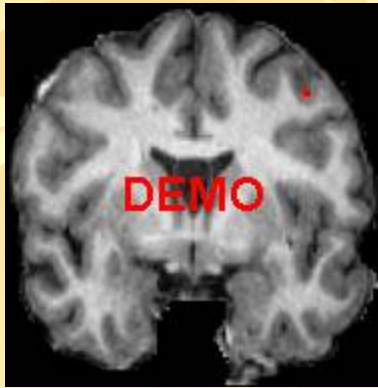


**Follow-Up scan:** Areas where control subjects showed greater activation than dyslexics



# Morpheme Mapping

**Initial scan:** Areas where control subjects showed greater activation than dyslexics



**Follow-Up scan:** Areas where control subjects showed greater activation than dyslexics



■ Results for group comparison for both tasks indicate:

- Activation patterns of Dyslexics look more similar after treatment than before treatment to those of Controls
- Due to increase in activation among Dyslexics and some decrease in activation among Controls



Berninger  
Richards



This comprehensive, yet easy to understand primer for educators introduces the structural and functional organization of the brain. Recent research and imaging technologies are used to illustrate how the brain operates in reading, writing, and computing mathematics. This information is used to support select instructional practices and to dispel popular myths on learning styles and maturational readiness for advanced learning. Heavily illustrated, and with a number of thoughtful exercises, this book will provide educational professionals and psychology researchers with the necessary neuroscience background to make sense of how the brain is organized, how to optimally construct learning environments, and best practices for teaching.

## Brain Literacy for Educators and Psychologists

Virginia W. Berninger  
University of Washington, Seattle

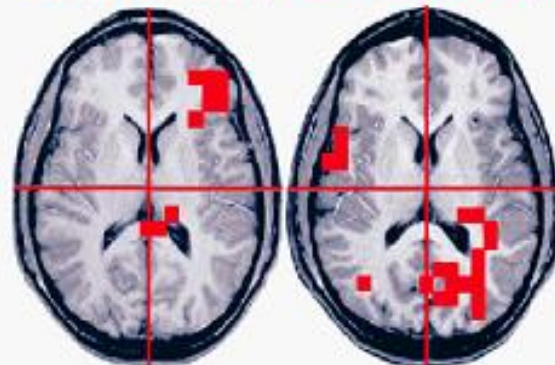
Todd L. Richards  
University of Washington, Seattle



Shipping Classification: Psychology

Brain Literacy for Educators and Psychologists

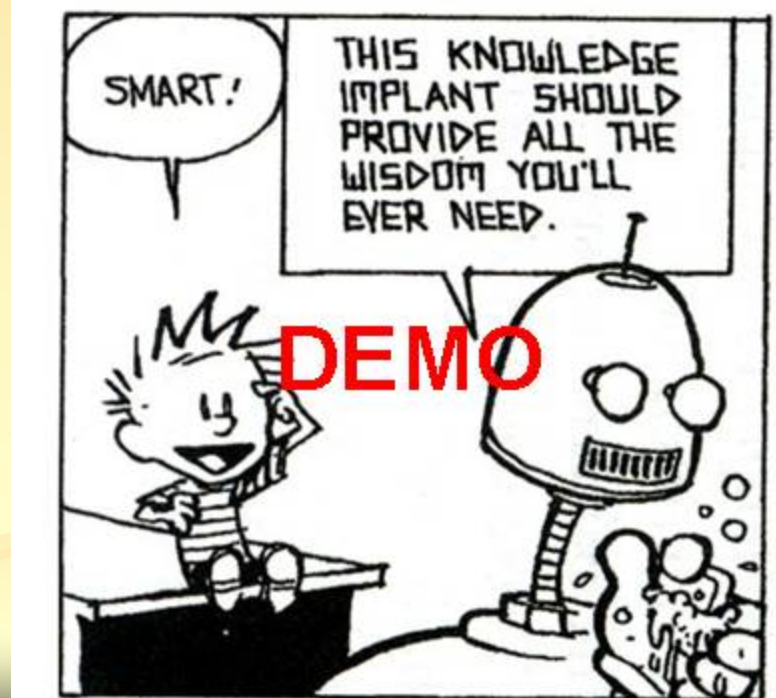
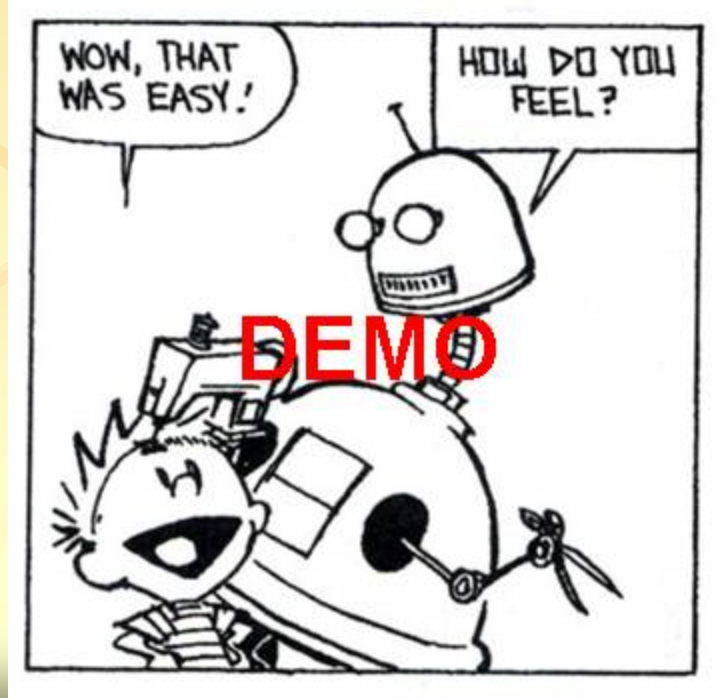
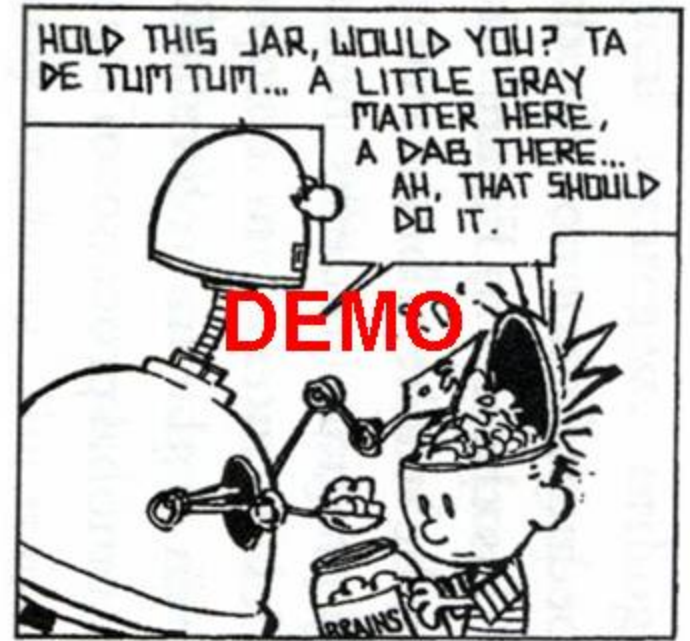
before teaching after teaching



## Brain Literacy for Educators and Psychologists

Virginia W. Berninger  
Todd L. Richards







# Neural Changes Following Remediation in Adult Developmental Dyslexia

Eden, et al., (2005) *Neuron*, 44, 411-422

- 19 adult dyslexics (mean age 44)
- 9 dyslexics received small group, daily 3-hour intervention for 8 weeks (112.5 hours) “multisensory” training:
  - sound awareness, rules for letter-sound association, sensory stimulation, articulatory feedback, and visual imagery
- Significant gains in phonological processing, non-word decoding, and reading accuracy
- Functional imaging showed enhanced use of left hemisphere inferior parietal lobe, intraparietal sulcus, and fusiform/parahippocampal gyrus as well as several right hemisphere regions (superior parietal & posterior temporal).

Teens/Adults with  
Learning Disability

Teens/Adults with  
AD/HD

Strategies for Success

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graph TD; A[Teens/Adults with Learning Disability] --> C[Strategies for Success]; B[Teens/Adults with AD/HD] --> C;
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# General Outline

## ■ Learning Disability

- Definition and Terminology
- Neurodevelopmental Foundations
- Persistence into Adolescence/Adulthood
- Neural Changes with Intervention

## ■ **AD/HD**

- Definition and Subtypes
- Neurodevelopmental Foundations
- Persistence into Adolescence/Adulthood
- Multi-modal Treatment
- Co-Morbidities
- Psychosocial Outcomes

# Terminology for Attention-Deficit/Hyperactivity Disorder

- 6 of 9 Inattention Symptoms and/or
- 6 of 9 Hyperactive/Impulsive Symptoms
- Developmentally Inappropriate Levels
- Duration of at least 6 months
- Occurs across settings
- Impairment in Major Life Activities
- Onset of Symptoms/Impairment by age 7
- Exclusions: Severe MR, PDD, Psychosis

# Inattention Symptoms

- Fails to give close attention to details
- Difficulty sustaining attention
- Does not seem to listen
- Does not follow through on instructions
- Difficulty organizing tasks or activities
- Avoids tasks requiring sustained mental effort
- Loses things necessary for tasks
- Easily distracted
- Forgetful in daily activities

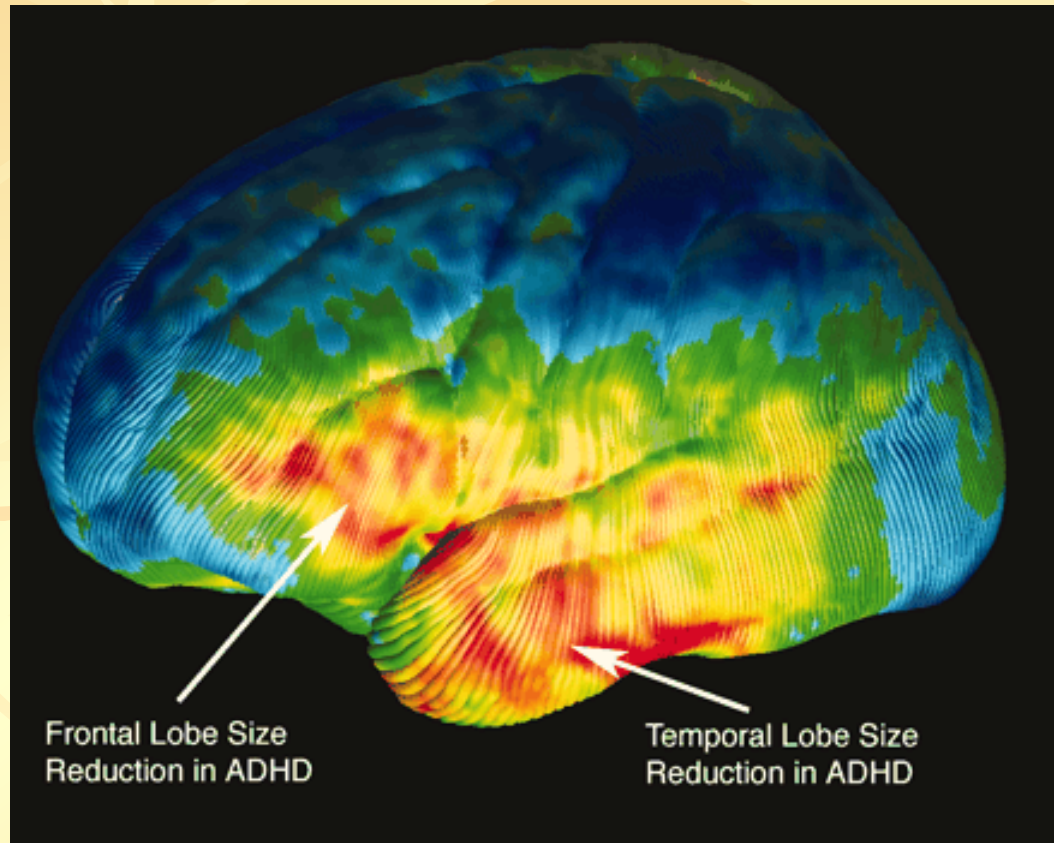
# Hyperactive-Impulsive Symptoms

- Fidgets with hands/feet or squirms in seat
- Leaves seat in classroom inappropriately
- Runs about or climbs excessively
- Has difficulty playing quietly
- Is “on the go” or “driven by a motor”
- Talks excessively
- Blurts out answers before questions are completed
- Has difficulty awaiting a turn
- Interrupts or intrudes on others

# Subtypes of ADHD

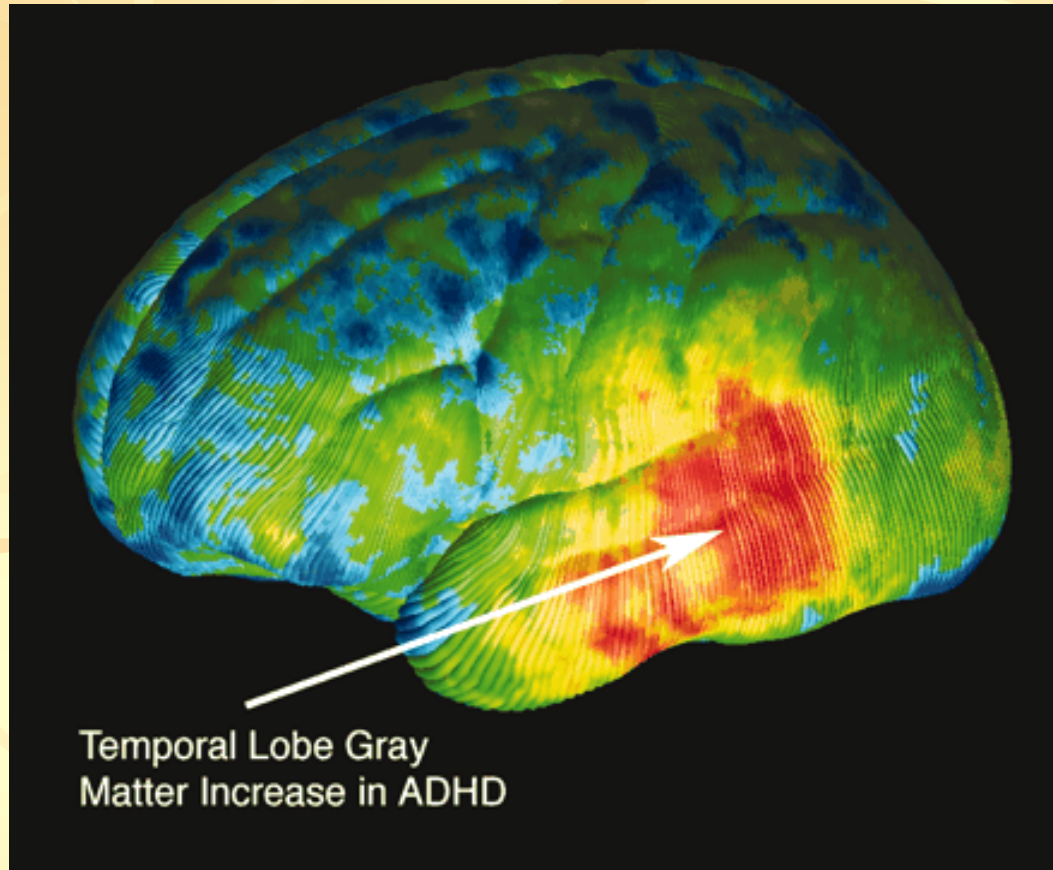
- Combined – 6/9 Inattentive Symptoms and 6/9 Hyperactive/Impulsive Symptoms
- Predominantly Inattentive – 6/9 Inattentive Symptoms
- Predominantly Hyperactive/Impulsive – 6/9 Hyperactive/Impulsive Symptoms

**Three-dimensional, high-resolution MRI image of the brain of a patient with ADHD shows reductions (in yellow and red) in the size of specific areas within the frontal and temporal lobes. (UCLA Laboratory of Neuro Imaging) Lancet. 2003 Nov 22;362(9397):1699-707.**





**A three-dimensional, high-resolution MRI image of the brain of a patient with ADHD shows regional increases in the density of gray matter. Areas in yellow and red average between 10 percent and 24 percent more gray matter than those of the average control subject. (UCLA Laboratory of Neuro Imaging) Lancet. 2003 Nov 22;362(9397):1699-707.**



# Persistence of ADHD-Combined Type

Barkley (2000)

- **Adolescence** 80% continue to meet diagnostic criteria for ADHD
- **Adults**
  - 3-8% Self-Report (Yes-No DSM criteria)
  - 28% Self-Report (Likert-Scale Checklist)
  - 67% Other-Report (Likert-Scale Checklist)

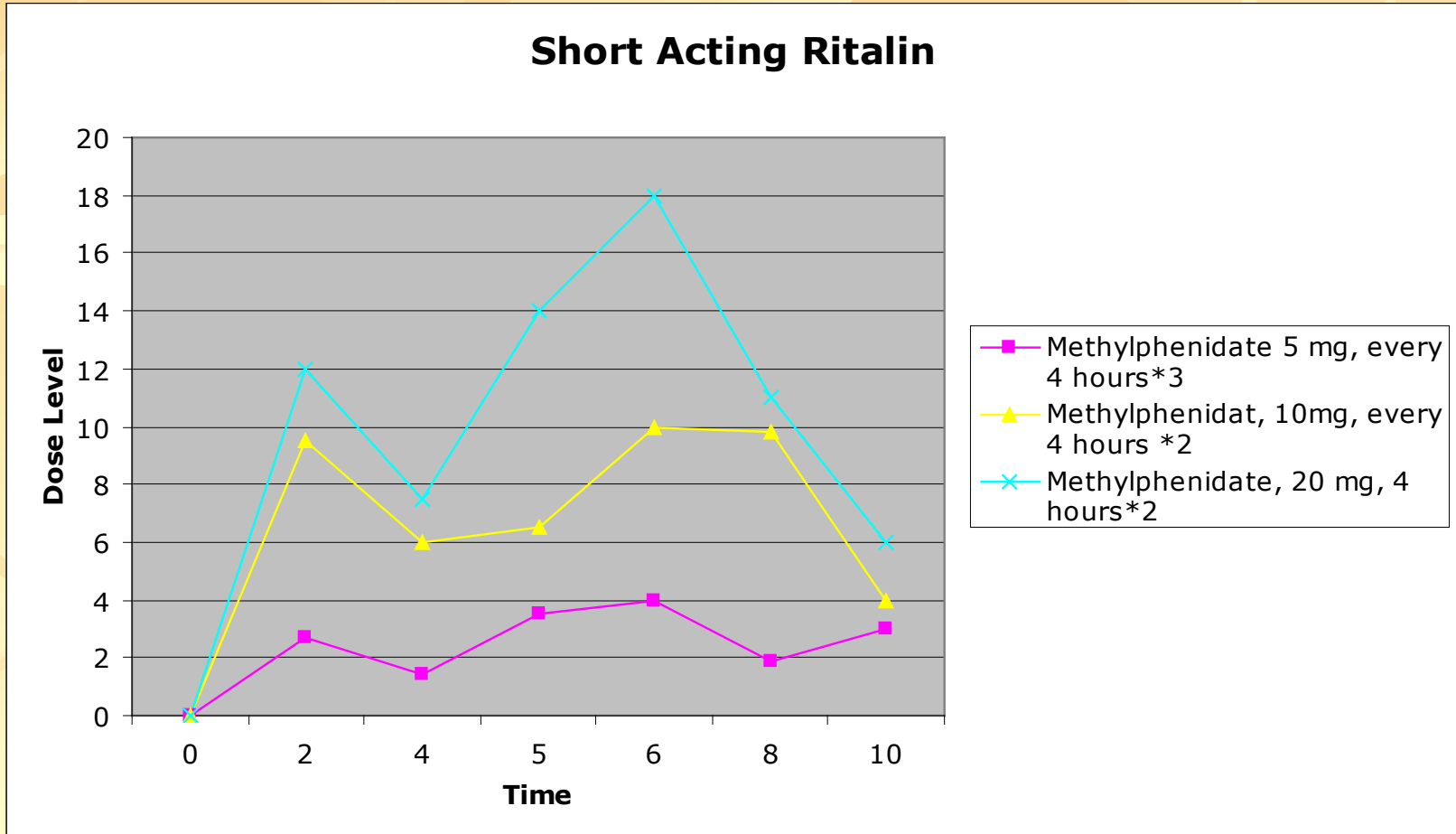
# Multi-Modal Treatment of AD/HD

- Education regarding AD/HD
- Medication when required
- Education/Workplace accommodations
- Individual and family counseling
- Parent training for teens
- Coaching for teens/adults

# Medications

- Short Acting Stimulants
  - Ritalin
  - Adderall
  - Focalin
- Long Acting Stimulants
  - Concerta
  - Metadate CD
  - Ritalin LA
  - Ritalin SR
  - Adderall XR
  - Focalin Long Acting -  
Due December 2005
- Non-stimulant
  - Stratera
  - Wellbutrin

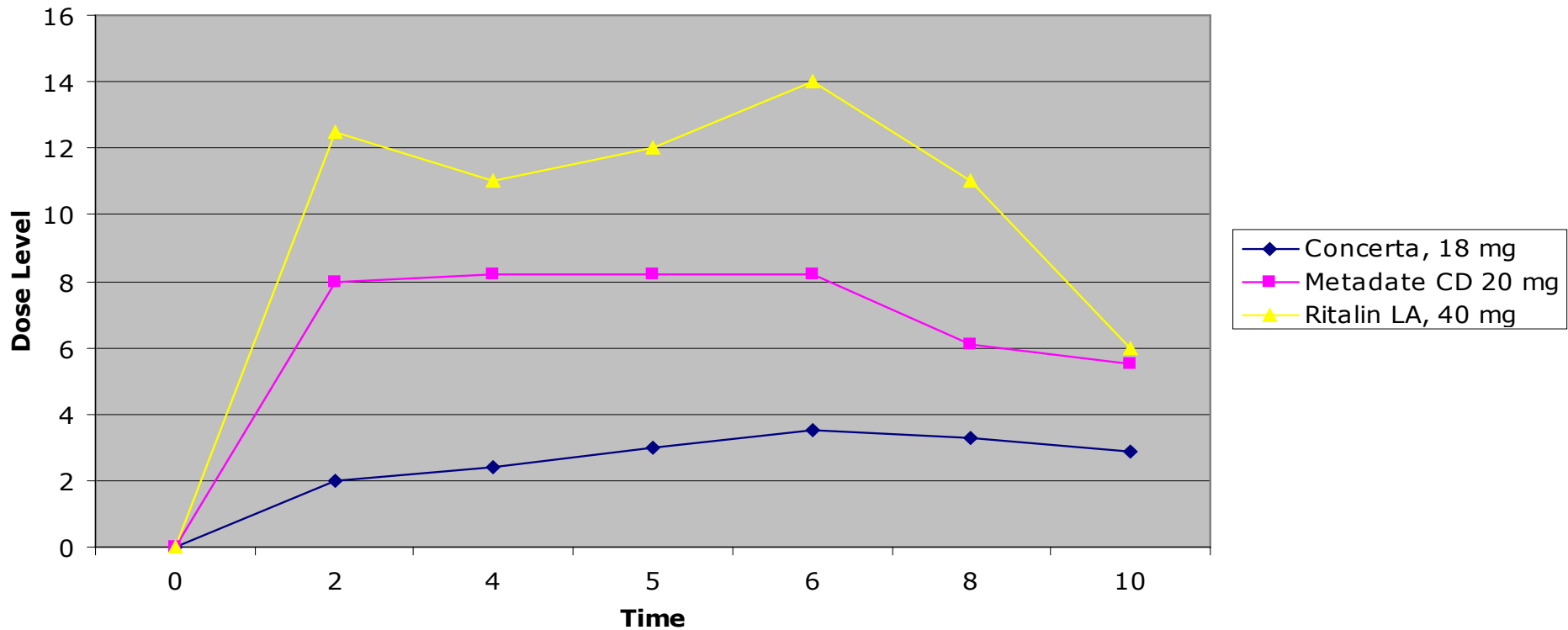
# Delivery Patterns - Short Acting



**\*\*Estimates from pharmaceutical handouts\*\***

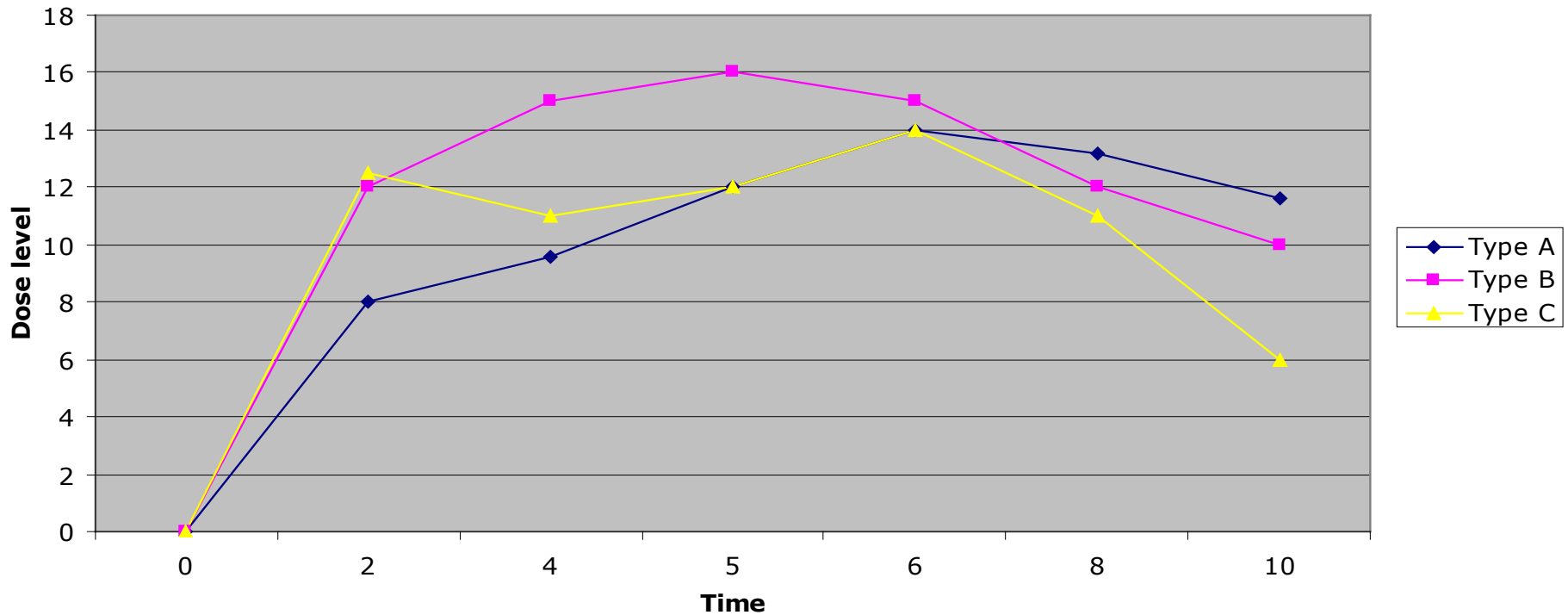
# Delivery Patterns - Long Acting

## Long Acting Ritalin Delivery Systems



**\*\*Estimates from pharmaceutical handouts\*\***

## ESTIMATED Equated Dosing Levels



**\*\*Estimates from pharmaceutical handouts\*\***

# Co-Morbidity in Adolescents and Adults with ADHD

- Learning Disabilities (20-50%)
- Disruptive Behavior Disorders (25 – 50%):
  - Oppositional/Defiant DO,
  - Conduct DO
  - Antisocial Personality DO
- Depression/Anxiety Disorders (25-30 %)
- Substance Abuse Disorders (10-20%)



# Co-morbidity and Service Costs higher in adults with ADHD

- Large insurance claims database studied, comparing 2,252 adults with ADHD to 2,252 matched controls.
- Adults with ADHD significantly more likely to have co-morbid diagnosis
  - Asthma, Anxiety, Bipolar Disorder, Depression, Substance or Alcohol Abuse, or Antisocial Disorder
- Also had significantly higher medical costs of all types
  - Inpatient, Outpatient, and Prescription
- Missed more work days due to “unofficial” absence

# Protective Factors for Psychosocial Outcome in AD/HD

- Milder AD/HD symptoms
- Higher IQ
- Fewer co-morbid conditions
- Early diagnosis and treatment
- Stable and structured home environment
- Absence of conduct disorder diagnosis

# Psychosocial Problems in Adolescents and Adults with ADHD

- Educational problems:
  - 25-35% held back in school
  - 14% expelled (5%)
  - 30-40% drop out of school (9%)
  - 20% enter college (40%) 5% graduate (35%)
- Social Relationship problems:
  - Fewer close friends
  - Shorter dating relationships
  - More likely to divorce



# Psychosocial Problems in Adolescents and Adults with ADHD

## ■ Employment Problems:

- More likely to be fired
- Change jobs 3 times as often
- ADHD symptoms impair job performance
- Under-employed for IQ/family background

## ■ Driving Problems:

- More traffic accidents and speeding tickets
- Worse traffic accidents (twice to thrice the injuries and cost)
- More license suspensions and revocations



# Psychosocial Problems in Adolescents and Adults with ADHD

## ■ Sexual Activity:

- Begin sexual activity about one year earlier than peers
- More sexual partners/less time with each
- Less likely to use contraception
- Much more likely to have teen pregnancies
- Much less likely to have custody of offspring
- More likely to receive treatment for sexually transmitted disease

# Prevalence of ADHD in young male prison inmates Rosler, et al. (2004)

- Overall prevalence of ADHD according to DSM IV criteria was 45%
- 89% of ADHD inmates also had substance use disorder or alcoholism
- Only 8.5% of inmates had no psychiatric disorder at all.

Adults with  
Learning Disability

Adults with  
AD/HD

Strategies for Success

# Transition for K-12 to Post-Secondary Education: Issues for Students with LD/ADHD

- K-12 Education
  - Public school systems have mandate to, at public expense:
    - identify,
    - remediate and
    - accommodate
- Post-Secondary Education/Workplace
  - There is no uniform mandate except for accommodation under state and federal law (e.g., Americans with Disabilities Act).



# OUTCOMES

- Academic Concerns
- Work Place Concerns and Resources
- Case Study

# Academic Issues

- College Entrance
  - ACT and SAT Documentation
  - College Documentation
  - Disclosure
- College Accommodations
  - Classroom
  - Technology
  - Living

# Testing Documentation for SAT/ACT

- Qualified Individual
  - Clinical psych, Neuropsych, LD specialist
- Recent 3 (ACT) - 5 (SAT) years
- Individual's history
- IQ test
  - review list - WA state test list not the same
- Achievement testing
- Neuropsychological / Information processing tests
- Accommodations
- Diagnostic statement

# Important tests

- IQ Tests - require recent tests (i.e. WISC - IV and SB-V)
- Timed reading measures (less familiar in WA)
  - GORT's
  - Nelson Denny
- Timed Math Measures (few options)
  - **\*\*NO WRAT (Wide Range Achievement Test)\*\***
  - Stanford Diagnostic math
  - WJ - III Fluency

# College Documentation

- Must submit documentation - if it passed SAT/ACT - usually accepted by university
- CHECK WITH UNIVERSITY FOR DOCUMENTATION REQUIREMENTS
  - Exception - some schools require Clinical Psychologist or Neuropsychologist
- Submit EARLY
  - Many schools offer “accommodations package”
  - Give student time to update documentation as needed
- Evergreen has been reported to have a loan program to pay for evaluation

# Student's Decision for School Disclosure in Applications

- Benefits
  - Can explain bad grades or highlight strong performance
  - May warrant separate review
- Disadvantages
  - Some students may try to use it as an excuse
- If student is willing to discuss it honestly - (i.e. explanation vs. excuse) - tend to recommend disclosure

# Classroom

- Taping lectures
  - Different campuses have different policies on recording lectures
- Note takers
- Additional time for tests
- Use of computer/laptop for writing and/or dictating answers
- Reader/books on tape/reading pen/text-to-speech
- Room free from distractions for tests
- Some campuses offer additional instruction specifically for LD & AD/HD students

# Technology

- Tons of great technology
  - [www.explanationsld.com](http://www.explanationsld.com)
    - Power Point presentation on technology
- Highlights
  - Personal Digital Assistants (w/camera's and digital voice recorders)
  - Digital voice recorders
  - Voice recognition software
  - Reading Pen



# PDA's



# Digital Voice Recorder

- Can download recordings to PC
- Easier to scan and find information
- Can link with speech recognition software
- Cost - \$79 - 300+



# Voice Recognition

- Voice is transcribed
  - Must read well to train
  - Faster to work in program, but can put it directly into word
  - Can train specific words
- **HARDWARE IS IMPORTANT!!!!!!**
- Best population - written language disorders
- Avoid: - word retrieval
- Cost of this program
  - \$79 - \$700 (professional version)

# Quicktionary Reading Pen II

- American Heritage dictionary
- Reading both the words and definition aloud using its miniaturized text-to-speech technology
- Contraindications – needing to read lots of words
- Cost - apprx. \$250



# Living

- Many students requesting single room and/or quiet dorms
- Often allowed with letter from “professional” stating the reason the individual needs the special environment

# Work Place Concerns

- Accommodations
- Program resources
- Organizations

# Work place accommodations

- ADA compliance
- Many organizations such as Microsoft will provide trainers to teach individuals to use tools or retrain in job duties
- Still must be able to perform job

# <http://www.jan.wvu.edu/media/LD.html>

- Scanners to enter data
- Calculators which complete conversions (I.e. foot / inches)
- Electronic dictionaries
- Additional time to complete tasks
- Cue cards (assignment list, conversion charts, etc.)



# Program Resources

- Adult Literacy Programs
  - Eastside Literacy
- Community Colleges/Universities
  - Seattle Central Community College Adult Education Program
- Support Groups and Organizations
  - LDA
  - CHADD

# Support Groups and Organizations

- Learning Disabilities Association of America
  - <http://www.ldanatl.org/>
- International Dyslexia Association (IDA)
  - <http://interdys.org/>
- Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD)
  - <http://www.chadd.org/>
- List of Agencies and resources
  - <http://www.ldanatl.org/aboutld/resources/information.asp>

# Case Study

- John Doe
  - Age:52
- History
  - Placed in special education as a child in rural Oklahoma
  - Graduated high school and attended Community college for approximately 1.5 years
  - Worked as a delivery driver, shipping coordinator, linen department in hospital
- Spent 5 years trying to learn to read at Eastside Literacy

# Assessment as of 6/03

- NLD IQ on CTONI - SS 67
  - Subtest scores ranged from
    - Geometric Categories - SS 9
    - Geometric Analogies - SS 2
- PPVT - III SS 79
- WRAT III
  - Reading SS <45 GE 1.8
  - Arithmetic SS 60

# Life functioning

- Functional reading and writing skills - early 1st grade
- Math skills-
  - could complete simple addition, subtraction and multiplication
  - Counting on fingers for simple calculations

# Writing Sample 1/01 - Final draft

- hopelink sure know how to put on a show. They are very classy in the work that they do. you can tell they work very hard to put it together. So the people could see for them self the kind of work that gos in to helping someone to make a difference in someone life. You may not every know how hard it is untill your on family turn their back on you.

# Intervention

- Diagnosed with AD/HD - Inattentive
  - Medication
- Multi-sensory approach to reading instruction and repeated readings
- Hands on instruction in mathematics
- After a year of one-on-one remediation - enrolled in Seattle Central's Adult Education program

# Assessment 11/03

- On Medication, 4 months intervention
- Stanford Binet -V
  - Full Scale IQ 90
  - Subtest scores ranged from
    - NV Knowledge and V Fluid Reasoning - SS10
    - NV Quantitative Reasoning and V Working Memory SS 7
- WJ-3 Achievement
  - Letter Word ID - SS 75
  - Passage Comprehension - SS 85
  - Calculation - SS 96



# Outcomes

- Currently reading on a 4- 6th grade level
- Completed the book “A Lesson Before Dying”
- Took his first solo vacation ever - could actually read the street signs as he was driving to know where he was going
- Enrolled in 80’s level math class at a community college
- Plans to pursue teaching degree

# Writing Sample - 10/04 - Final draft

- Most of the vibrant colors of the leaves have fallen. The demise of the trees is always an annual event. The rooftops are spouting smoke from the chimney and there is an ice crust over the peak of the roof at daybreak. As I step out into the crisp brisk air, there is smoke on my breath. It is hard not to notice the ice cover over the vehicles and the green grass looks white like snow. As I continue my walk, I can't help but notice that fall is upon us.

# Main Points

- Developmental learning and attention disorders have a basis in brain functioning.
- These disorders are more likely than not to persist into adolescence and adulthood.
- Treatments are available that reduce symptoms and normalize brain functioning.
- Accommodations are available to reduce impact in education and the workplace.