Learning Challenges for Children with Epilepsy and Children with Turner’s Syndrome

Learning Objectives

- Identify key risk factors for learning problems in children with epilepsy
- List typical neurocognitive profile features for girls with Turner’s syndrome
- Identify key components of coordinated medical/educational management of these learning challenges

Learning Challenges for Children with Epilepsy

- Most children with epilepsy progress well in school
- There is an increased rate of school problems in children with epilepsy
- Many factors affect learning and school performance

Conflict of Interest Disclosure

- Kaplan Early Learning Company, Inc. – Markets Nemours BrightStart! educational tools and professional development (all related to reading readiness)
- Smart Horizons – Provides Nemours BrightStart! online professional development training (related to reading readiness)

Longitudinal Research

(Bailet & Turk, 2000)

- Study compared children with epilepsy to their siblings and to a matched group of children with migraines
- Followed for ≥ 3 years
- Children with epilepsy scored worse than both other groups on most measures
- No clear predictive pattern based on medical factors

Seizure-Related Factors That May Be Treatable

- Medication side effects
- Ongoing seizures and frequency
- Subclinical seizure activity within the brain
- Emotional distress regarding the seizures and their treatment
Seizure-Related Factors That Cannot be Changed
- Underlying brain malformation
  - Type, size, and location
- Underlying brain disturbance
- Underlying genetic vulnerability
- Age of seizure onset
- Seizure type or epilepsy syndrome

Do Seizures Cause Learning Problems?
- Usually NOT!
- Underlying brain disturbance can cause both seizures and learning problems
- Presence of learning problems at a young age is a stronger predictor of persistent learning problems than seizures themselves

Do Seizures Cause Learning Problems?
- The strongest outcome predictors of school performance in children with epilepsy are the presence of pre-existing learning problems, family socioeconomic status, parents’ educational level, and family psychosocial status
- This is true for ALL children, not just those with epilepsy

Anti-epileptic Drug Effects on Cognition
- This is very challenging
- Very difficult to do the types of controlled studies necessary to answer all the questions
- Older drugs tend to cause more problems (Phenobarbital, Dilantin)
- Poly-therapy and/or higher doses have more cognitive side effects

Anti-epileptic Drug Effects on Cognition
- Interaction with specific child characteristics (age; presence of pre-existing cognitive impairment; length of time on drug)
- Any AED has potential for adverse cognitive side effects
- Sometimes the AED improves cognitive functioning
Common Processing Deficits in Childhood Epilepsy
- Rapid verbal processing
- Word retrieval
- Verbal working memory
- Rapid, new learning capacity
- Psychomotor speed
- Executive functioning

Impact of Cognitive Processing Deficits
- These cognitive processing deficits cut across virtually all academic achievement areas
- In addition, children with epilepsy may have specific learning disability patterns, such as developmental dyslexia, complicated potentially by seizure characteristics

Initial Steps To Take
- Check vision and hearing
- Get specific information from the teacher
- Increase monitoring of child’s assignment completion
- Consider tutoring for specific skills
- Discuss persistent school problems with your child’s doctor

What To Do Next??
- Seek a psychological and educational evaluation, which should include:
  - General intellectual, specific cognitive, and memory skills
  - Academic achievement skills
  - Behavioral, attentional, emotional, and psychosocial status

Psychoeducational Assessment
- Nature of assessment may be different; greater focus on subtle language processing abilities, verbal learning capacity, working memory, and psychomotor speed
- Executive functions and attentional skills should be assessed, along with emotional status

Timing of the Psychoeducational Assessment
- Assessment should NOT be undertaken for several weeks if medication is begun or changed
- Assessment should NOT be undertaken within 1 week of a convulsive seizure
- If there is any question about a possible confounding medical factor, assessment should be postponed
Types of Learning Disorders

- Learning Disabilities
- Attention Deficit/Hyperactivity Disorder
- Developmental Delay
- Mental Handicap
- Behavioral or Emotional Disorder
- Autism Spectrum Disorder

Learning Disability

- Child displays normal learning abilities in some skills, and major learning problems in other specific areas
- There are many types of learning disabilities, but the most common by far is reading disability (dyslexia)

Learning Disability

- Other types of learning disabilities may occur in writing, math, language processing, social skills, or ability to process shapes and visual nonverbal patterns
- Many children have more than one learning disability
- Ten percent or more of school-age children have a learning disability
- Children with epilepsy are at higher risk of having a learning disability than the general school-age population

Attention Deficit/Hyperactivity Disorder (ADHD)

- Characterized as excessive inattention, distractibility, impulsivity, and/or hyperactivity as compared with other children of the same age
- Symptoms must cause persistent functional impairment

Attention Deficit/Hyperactivity Disorder (ADHD)

- ADHD may occur by itself or with another learning disorder
- ADHD symptoms sometimes look like features of the child’s seizure disorder
- Some seizure medications can contribute to ADHD symptoms
Attention Deficit/Hyperactivity Disorder (ADHD)

- In some cases it is possible to treat both seizures and ADHD at the same time
- This should be carefully discussed with the child’s doctor

Mental Handicap (Retardation)

- Characterized by significant impairment in most learning, self-care, and social skills, which persist over time
- Generally defined as having valid, reliable IQ and adaptive functioning scores of less than 70

Developmental Delay

- A general term that describes young children whose learning, motor, and/or social skills are below average
- Is used to describe children who are slow learners, as well as those with mental handicap

Autism Spectrum Disorder

- Characterized by significant impairment in communication, social interaction, and behavior
- Includes autism, pervasive developmental disorder, and Asperger’s Disorder

Autism Spectrum Disorder

- Most children with autism have significant difficulty learning language and relating to others
- They often display abnormal behaviors, emotions, and sensory responses
- About 25% have seizure disorders

Behavioral and Emotional Disorders

- Oppositional-Defiant Disorder
- Conduct Disorder
- Depression
- Anxiety Disorder
- Bipolar Disorder
- Adjustment Disorder
What Evaluation Results Should Tell You

- Child's level of performance in each area assessed
- Child's pattern of performance
- Pertinent diagnoses
- Strengths as well as weaknesses

- Broad parameters for intervention
- Potential risk factors to monitor for
- Books, websites, and community resources for assistance and information

What If There Is No Diagnosis??

- Some children with learning problems don't fit a particular pattern or category
- You can still identify relative strengths and weaknesses
- The psychologist/educator should still be able to make intervention suggestions

- Anxiety from loss of physical or mental control
- Fear of seizure recurrence
- Fear of safety during a seizure
- Social prejudice and stigma
- Medication side effects

Family Stresses

- Fears for child's safety
- Overprotectiveness
- Unresolved guilt, anger, and depression
- Extra burden on siblings
- Financial strain
- Time burden

Counseling Supports

- Educational
- Supportive
- Therapeutic
**Common Learning Difficulties in Children with Epilepsy**

- Reduced processing and working speed
- Reduced memory capability
- Difficulty with sustained attention
- Difficulty comprehending, organizing, and following through to complete multi-step tasks

**Educational Options**

- Special education classes for those who qualify according to IDEA regulations
  - Learning disabilities
  - Mental handicap
  - Other health impaired
- 504 plan in the regular classroom
  - Accommodations or modifications that enable the child to perform better

**Educational Options**

- Examples of 504 accommodations:
  - Assistance of a note taker
  - Extra time on tests
  - Option to respond verbally on tests
  - Option to mark answers in the test booklet rather than on a “bubble” response form
  - Placement close to the teacher for close monitoring
  - Daily report home to parents

**References for Childhood Epilepsy**

Turner’s Syndrome
- Occurs only in girls
- Genetic abnormality (loss of part or all of second X chromosome)
- Short stature; mild skeletal abnormalities; failure to spontaneously develop secondary sexual characteristics; usually infertile
- Often have learning disabilities

Learning Challenges for Girls with Turner’s Syndrome
- Average verbal intelligence
- Nonverbal skills in low average to below average range
- Specific math difficulties
- Hyperactive as young children
- Social skill deficits

Learning Challenges for Girls with Turner’s Syndrome
- Follows a NVLD pattern
- Cognitive profile and functional skills highly variable
- Many functional normally
- More severe cognitive impairment tends to be associated with amount of X chromosome missing and which sites

Neurobiological Basis for Cognitive Deficits in Turner’s
- Genetic defect causes problems in fetal brain development (neuronal migration errors, connectivity abnormalities, etc.)
- Hormonal insufficiencies further affect white matter formation, both early in life and later in puberty

Educational Approach For Turner’s Syndrome
- Similar to approach for NVLD and for children with epilepsy that affects school performance

Helpful Books and Websites
- www.wrightslaw.com
- www.epilepsyfoundation.org
- www.ldonline.org


