

# ***Professionals in Epilepsy Care Symposium How Practitioners Can Use Neuropsychological Testing to Improve Patient Care and Outcomes***

**Symposium Chairs:  
Linda Allen, BSN, RN  
Epilepsy Program Coordinator  
Froedtert Hospital/Medical College of Wisconsin  
Milwaukee, Wisconsin**

**Philip S. Fastenau, Ph.D.  
Professor & Director of Clinical Neuropsychology  
Department of Neurology  
Case Western Reserve University School of Medicine  
Neurological Institute, University Hospitals Case Medical Center  
Cleveland, OH**

**Sunday, December 5, 2010  
Henry B. Gonzales Convention Center – Room 006 A-C  
6:00 – 8:30 pm**



## OVERVIEW

Neuropsychological assessment has played a prominent role in epilepsy care for many decades. Neuropsychological functioning has been related to many outcomes in children and adults with epilepsy, including academic and vocational success, social functioning, and mental health. Furthermore, cognitive functioning can affect the degree to which individuals with epilepsy can participate in their clinical education and self-care. Existing and emerging research findings have important implications for how professionals in epilepsy care should use neuropsychological test results to change patient outcomes in a variety of spheres. This symposium will help clinicians from wide-ranging backgrounds and specialties translate neuropsychological test findings into relevant interventions and multidisciplinary collaborations for improving outcomes in patients across the lifespan.

## LEARNING OBJECTIVES

- Apply a theoretical model to conceptualize the role of neuropsychological functioning in various psychosocial outcomes among children and adults with epilepsy and refer for neuropsychological evaluation and intervention in timely fashion
- Collaborate more closely with school staff and educational specialists to ensure that cognitive and behavioral strengths are incorporated into an individualized treatment plan to improve academic performance in children and adolescents with epilepsy
- Collaborate more closely with vocational rehabilitation specialists to use documented cognitive and behavioral strengths to optimize vocational success in adults with epilepsy
- Utilize neuropsychological data in coordinating psychiatric treatment plans to enhance psychosocial adaptation and quality of life
- Tailor patient education and care to the individual's cognitive limitations, coordinate consultations and interventions by multiple disciplines, and monitor the individual's academic, vocational, and mental health progress.

## TARGET AUDIENCE

- Basic / fundamentals: Those new to epilepsy treatment or whose background is limited, e.g. students, residents, general physicians, general neurologists and neurosurgeons, other professionals in epilepsy care, administrators.
- Intermediate: Epilepsy fellows, epileptologists, epilepsy neurosurgeons, "mid-level" providers with experience in epilepsy care (e.g., advanced practice nurses, nurses, physician assistants), neuropsychologists, psychiatrists, basic and translational researchers.

## AGENDA

6:00 – 6:25 pm	Overview of Neuropsychological Functioning in Epilepsy Across the Lifespan and Implications for Use of Testing to Modify Patient Outcomes Philip S. Fastenau, Ph.D.
6:25 – 6:50 pm	How to Use Neuropsychological Test Results to Improve Academic and Behavioral Outcomes in Schools Mary Lou Smith, Ph.D.
6:50 – 7:15 pm	Role of Neuropsychological Functioning in Vocational Rehabilitation Robert T. Fraser, Ph.D., M.P.A., C.R.C., C.L.C.P.
7:15 – 7:40 pm	Role of Neuropsychological Functioning in Psychiatric Assessment and Treatment Rochelle Caplan, M.D.
7:40 – 8:05 pm	Role of Neuropsychological Functioning in Patient Education and Coordination of Care Madona D. Plueger, B.S.N., RN, CNRN
8:05 – 8:30 pm	Case Presentation and Discussion Linda Allen, B.S.N., RN

## **ACCREDITATION**

The American Epilepsy Society is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

## **CREDIT DESIGNATION**

The American Epilepsy Society designates this educational activity for a maximum of 2.5 *AMA PRA Category 1 Credits*<sup>™</sup>. Physicians should only claim credit commensurate with the extent of their participation in the activity.

## **ACKNOWLEDGEMENT**

This program is supported by an educational grant from Pfizer Inc.

## **PHARMACY ACCREDITATION INFORMATION**



The University of Minnesota, College of Pharmacy is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

This knowledge-based activity provides up to 2.5 contact hours (.25 CEUs). Following attendance, completion of the activity evaluation and verification of attendance, participants will be provided an electronic statement of credit. ACPE Universal Activity Number (UAN) is 031-999-10-025-L01-P

## **NURSING ACCREDITATION INFORMATION**

Nursing contact hours have been applied for through the Texas Nurses Association, an accredited approver of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

To successfully complete either program and receive 2.5 Nursing Contact Hours, please complete and return the paper evaluation form to the volunteers at the door or the main registration desk at the conclusion of the program. You will receive your CE certificate in exchange for a completed form.

## **POLICY ON COMMERCIAL SUPPORT AND CONFLICT OF INTEREST**

The American Epilepsy Society maintains a policy on the use of commercial support, which ensures that all educational activities sponsored by the AES provide in-depth presentations that are fair, balanced, independent and scientifically rigorous. All faculty, planning committee members, editors, managers and other individuals who are in a position to control content are required to disclose any relevant relationships with any commercial interests related to the activity. The existence of these interests or relationships is not viewed as implying bias or decreasing the value of the presentations. All educational materials are reviewed for fair balance, scientific objectivity and levels of evidence. Faculty disclosure will be made available through syllabus materials and faculty presentations.

## **FACULTY / PLANNER BIO AND DISCLOSURES**

**Linda Allen, BSN, RN**

**Epilepsy Program Coordinator**

**Froedtert Hospital/Medical College of Wisconsin  
Milwaukee, WI**

Linda Allen has been an epilepsy coordinator for 19 years. Her job includes coordinating patient care throughout the continuum for evaluation and treatment for refractory epilepsy patients. She has authored and co-authored numerous abstracts and articles related to epilepsy. She is on many speakers' bureaus for pharmaceutical companies, as well as our local EFA affiliate. Her mission is to educate the public on epilepsy and dismiss myths related to the same.

Linda Allen discloses receiving remuneration as a Speakers Bureau Member for Cyberonics.

**Philip S. Fastenau, Ph.D.**  
**Professor & Director of Clinical Neuropsychology**  
**Department of Neurology**  
**Case Western Reserve University School of Medicine**  
**Neurological Institute, University Hospitals Case Medical Center**  
**Cleveland, OH**

Dr. Fastenau is Professor of Neurology and Director of Neuropsychology at Case Western Reserve University School of Medicine and University Hospitals Neurological Institute. He has collaborated on projects funded by NIH, CDC, Rehabilitation Services Administration, national foundations, and the private sector and has published 50+ articles/chapters and 125+ abstracts. He is Consulting Editor for 3 journals and has sat on many study sections and national committees. Dr. Fastenau is a Fellow of the National Academy of Neuropsychology and Fellow of the American Psychological Association.

Dr. Fastenau discloses that his spouse is employed by Eli Lilly & Co (including stock options).

**Rochelle Caplan, M.D.**  
**Professor**  
**UCLA Semel Institute for Neuroscience and Human Behavior**  
**Los Angeles, CA**

Dr. Caplan is Professor of Psychiatry and studies thinking in pediatric neurobehavioral disorders; psychopathology, cognition, language, and unmet mental health care needs in pediatric epilepsy; the neuroanatomical basis of thought disorder and psychopathology in childhood epilepsy and schizophrenia, and pediatric non-epileptic seizures. She directed the UCLA Pediatric Neuropsychiatry program, serves on the Epilepsia and Epilepsy and Behavior editorial board, AES Psychiatric Task Force, and chairs the AES NES Task Force pediatric committees.

Dr. Caplan has nothing to disclose.

**Robert Fraser, Ph.D.**  
**Professor and Director, Neurological Vocational Services**  
**Dept of Rehabilitation Medicine**  
**University of Washington-Harborview Medical Center**  
**Seattle, Washington**

Dr. Robert T. Fraser is a professor in the University of Washington's Department of Rehabilitation Medicine, joint with the Departments of Neurological Surgery and Neurology and consultant with Associates in Rehabilitation and Neuropsychology. He was recently appointed to the Social Security Administration to advise on the revision to the disability eligibility process. He is an active counseling and rehabilitation psychologist, a certified rehabilitation counselor and a certified life care planner who directs Neurological Vocational Services within Rehabilitation Medicine.

Dr. Fraser has nothing to disclose.

**Madona Plueger M.S.N., RN, CNRN, ACNS-BC**  
**Neuroscience Clinical Nurse Specialist**  
**Barrow Neurological Institute**  
**St. Joseph's Hospital**  
**Phoenix, Arizona**

Registered nurse for over 20 years. Involved in care of patients with epilepsy for the last 14 years. Nurse Education Specialist for the Epilepsy Monitoring Unit for the last five years. Educational

background included principles of adult learning, curriculum development and evaluation of educational programs. Speaker on local, national and international level on topics in Epilepsy. Involved with the American Epilepsy Society, American Association of Neuroscience Nurses and Epilepsy foundation of Arizona.

Madona Plueger has nothing to disclose.

**Mary Lou Smith, Ph.D., C.Psych.**

**Professor**

**Department of Psychology, University of Toronto Mississauga**

**Senior Associate Scientist**

**Neuroscience and Mental Health Program, Hospital for Sick Children**

**Toronto, ON, Canada**

Mary Lou Smith did her graduate training at McGill University and the Montreal Neurological Institute and now works at the University of Toronto and the Hospital for Sick Children. Her past and present research has focused on cognitive and behavioral aspects of epilepsy, outcome of epilepsy surgery, and quality of life in children and adults with epilepsy. She has published widely in all areas, and has written over 95 papers and book chapters.

Mary Lou Smith has nothing to disclose.

**Meriem Bensalem-Owen, M.D (CME Content Reviewer)**

**Associate Professor of Neurology**

**University of Kentucky**

**Lexington, KY**

Dr. Bensalem-Owen is Associate Professor of Neurology at the University of Kentucky and was recently appointed as Director of the Epilepsy Program. Her primary clinical interests involve the treatment of epilepsy, medical and surgical. Dr. Bensalem-Owen is board certified by the American Board of Psychiatry and Neurology and obtained the certification in the Medical Specialty of Clinical Neurophysiology. She completed her residency training in Neurology at the University of Kentucky and fellowship training in Clinical Neurophysiology/Epilepsy at the University of Michigan.

Dr. Bensalem-Owen has nothing to disclose.

**Paul Levisohn, M.D. (Content Specialist)**

**Associate Professor of Pediatrics and Neurology**

**University of Colorado**

**Denver, Colorado**

Dr. Levisohn is Associate Professor of Pediatrics and Neurology at the University of Colorado School of Medicine and The Children's Hospital, Denver. He is former medical director of the Epilepsy Monitoring Unit at The Children's Hospital. He has served as chair of the AES Practice Committee. As such, he has been involved in addressing EMU safety needs. He currently serves as consultant to AES on medical content of AES continuing medical education activities.

Dr. Levisohn discloses receiving remuneration as a Consultant for Ovation Pharmaceuticals and Novartis Pharmaceuticals and Contract Research from Lundbeck and Eisai.

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Opinions expressed with regard to unapproved uses of products are solely those of the faculty and are not endorsed by the American Epilepsy Society or any manufacturers of pharmaceuticals.

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The Medical Education Evaluator® allows any attendee to self-manage the process of completing course evaluations, tracking credits and printing out the appropriate certificate for either *AMA PRA Category 1 Credits™*, CE or ACPE pharmacy statement of credits.

Log on to the Evaluator via the AES website at [www.aesnet.org](http://www.aesnet.org). Once you are on the Evaluator, you will be asked to enter your AES ID # and password. The certificate(s) are saved to your personal account page which is cumulative. You may print the certificate(s) in PDF format at any time.

To help support this process, attendees who want CME will be asked to pay \$35 before January 15 and \$50 after January 15.

**The online Evaluator will be left open through February 28, 2011. You must complete the evaluations and credit tracking by that date.**

By completing this information online, attendees greatly assist the Council on Education and Annual Meeting Committee with important needs assessment data whereby the AES can further plan and address educational gaps to meet the needs of our learners.

A meeting attendance certificate will be available for international meeting attendees at the registration desk.

#### **SYLLABUS**

Paper handouts will not be provided.

## Overview of Neuropsychological Functioning in Epilepsy Across the Lifespan and Implications for Use of Testing to Modify Patient Outcomes

December 5, 2010

Philip S. Fastenau, Ph.D.  
Professor, Department of Neurology  
Case Western Reserve University School of Medicine  
University Hospitals Neurological Institute

American Epilepsy Society Annual Meeting



## Disclosure

Eli Lilly & Co.

Spouse Employment  
with Stock Options

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## Individuals with epilepsy should be referred for cognitive assessment:

- A. when seizures have become medically refractory and surgery is a consideration.
- B. when they start falling behind in school or have difficulties at work.
- C. when they complain of cognitive problems.
- D. soon after the onset of the condition.

## Psychosocial Comorbidities in Epilepsy

- Mental Health Problems
- Academic Underachievement
- Poor Social/Vocational Adaptation
- Neuropsychological Deficiencies

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## Mental Health

- Children with Epilepsy
  - 26-29% with uncomplicated epilepsy
  - 4 – 5x higher vs. general population
  - 2.5x higher vs. other chronic illness
  - Most Common: Anxiety, Depression, ADHD
- Adults with Epilepsy
  - Mn 63% Axis I in epilepsy vs. 22% other chronic
  - OR 2.2 - 2.4 lifetime anxiety, suicidal thoughts

Rutter, Graham, & Yule (1970). *Neuropsychiatric Study in Childhood*.  
Davies, Heyman, & Goodman (2003). *Dev Med Child Neurol*, 45(5), 292-295.  
Hermann, Seidenberg, & Bell (2000). *Epilepsia*, 41 (Suppl. 2), S31-S41.  
Tellez-Zenteno, Patten, Jetté, Williams, & Wiebe (2007). *Epilepsia*, 48(12), 2336-44.

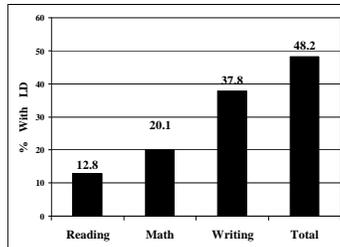
## Academic

As a group, children with epilepsy perform worse than expected in school

- Lower Grades
- Lower Achievement Test Scores
- More Repeated Grade Levels
- More Special Ed Placements
- More Frequent Diagnosis of LD

Farwell, Dodrill, & Batzel (1985). *Epilepsia*, 26, 395-400.  
Fowler, Johnson, & Atkinson (1985). *The Journal of Pediatrics*, 106, 683-687.  
Mitchell, Chavez, Lee, Guzman (1991). *Journal of Child Neurology*, 6, 65-72.  
Seidenberg, Beck, Geisser, Giordani, Sackellaers et al. (1986). *Epilepsia*, 27, 753-9.

## Academic



Fastenau, Shen, Dunn, & Austin (2008), *J Learning Dis*, 41, 195-207.

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## Social & Vocational

- Adults with childhood onset more likely to be:
  - Unemployed, underemployed, or without voc training
  - Unmarried, no children
  - Living with parents
- Greatest disability with undercontrolled szs

Jacoby (1995), *Epilepsy Research*, 21, 125-132. [n=494]  
 Jacoby, Baker, Steen, Potts, & Chadwick (1996), *Epilepsia*, 37, 148-161. [n=1391]  
 Kokkonen, Kokkonen, Saukkonen, & Pennanen (1997), *JNNP*, 62, 265-8. [n=81]  
 Shackleton, Kasteleijn-Nolst Trenité et al. (2003), *Neurology*, 61, 64-70. [n=243]  
 Sillanpää, Jalava, Kaleva, & Shinnar (1998), *N Engl J Med*, 338, 1715-22 [n=176]  
 Wakamotoa, Nagaob, Hayashia et al. (2000), *Brain & Devt*, 22, 246-255 [n=148].<sub>8</sub>

## Social & Vocational

- Pop.-based incidence cohort from 1<sup>st</sup> unprov. sz, n=144
- Factors predicting employment at M=23 yrs old
  - Normal IQ (OR 14.5)
  - Vocational education (OR 15.2)
  - Onset > age 6 years (OR 4.9)
- Factors predicting employment at M=48 yrs old
  - Normal IQ (OR 15.8)
  - Having offspring (OR 6.1)
  - 5-year terminal remission in adulthood (OR 4.8)
  - No history of status epilepticus (OR 12.8)

Sillanpää & Schmidt (2010), *Epilepsia*, 51(6), 1053-1060.

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## Neuropsychological Deficits

- Chronic Samples: Wide variety of NP deficits
- Decline associated with
  - Early Onset, Long Duration
  - Poor Seizure Control
  - Lower Premorbid IQ/Cognitive Reserve
  - Lower Brain Volumes on MRI (L CA, WM, GM)
  - Temporal Lobe Epilepsy (esp. for memory)
  - Temporal Lobe Resection (esp. verbal memory)

Elger, Helmstaedter & Kurthen (2004), *Lancet Neuro*, 3, 663-672. [Rev. 149 refs]  
 Helmstaedter, Kurthen, Lux, Reuber et al. (2003), *Ann Neurol*, 54, 425-432 [N=249]  
 Hermann, Seidenberg, Dow, Jones et al. (2006), *Ann Neurol*, 60, 80-87 [N=46].<sub>10</sub>

## Neuropsychological Deficits

- Recent Onset – Adults
  - Psychomotor speed and delayed visual memory recall in n=59 unmedicated at testing ... but also lower IQ (Pulliainen, 2000)
    - Very strong association with very low education attainment as children (76% of NP-impaired completed only primary school vs. 12% in NP-normal epilepsy group)
    - Very weak association (n.s.) with epilepsy variables
    - "Newly dx'd" (21% 2-10+ yrs s/p onset)
  - RT, sustained attn, verbal & visual memory in n=60 new-onset age 14+ pre-AED vs. 60 age-/sex-/ed-matched controls, excluding "subnormal intelligence" or psychiatric (Ogunrin, 2000)

Ogunrin, Adamolekun, Ogunniyi, & Aldenkamp (2000), *Can J Neurol Sci*, 27, 148-51  
 Pulliainen, Kuikka, & Jokelainen (2000), *Acta Neurol Scand*, 101, 73-78.

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## Neuropsychological Deficits

- Recent-Onset Children
  - Confrontational naming, inhibition, sustained attention, psychomotor speed, reading, spelling, and arithmetic ... and IQ (Hermann et al., 2006)
  - memory span, psy-mtr speed, reading, writing; not IQ (Ostrom et al, 2002, 2003; Schouten et al, 2002)
  - Psychomotor speed, attn; not IQ (Stores et al., 1992)
  - attention/phonological memory, phon. awareness, visual-motor integration; ? not IQ (Kolk et al., 2001)

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## Neuropsychological Deficits

- NP deficits precede onset in some children
  - Educational delays (Schouten, 2001; n=69)
    - 54% vs. 23% had received remedial services
    - 22% vs. 11% had repeated a year at school
    - Win 1<sup>st</sup> yr post-onset, 6 vs. 2 more repeated
  - ADHD (Hermann et al., 2007, n=75)
  - ADHD (Austin et al., 2003, n=224)

Austin, Harezlak, Dunn, Huster, Rose & Ambrosius (2003), *Pediatrics*, 107,115–122  
 Hermann, Jones, Dabbs, Allen, Sheth, Fine, et al. (2007), *Brain*, 130, 3135–48  
 Schouten, Oostrom, Jennekens-Schinkel&Peters (2001),*Dev Med Ch Neuro* 43,574–6.

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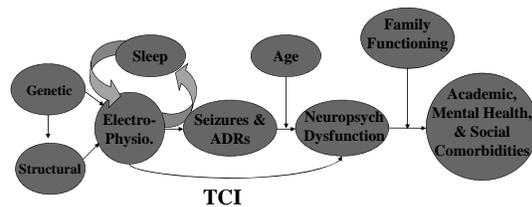
## Risks for LD

- Low IQ/class performance (Sillanpaa, 2004)
  - Symptomatic etiology (OR=7.64)
  - Poor response to AEDs (OR=3.22)
  - Status epilepticus (OR=2.00)
- Psychometric definitions (Fastenau et al., 2008)
  - Earlier seizure onset
  - Generalized nonabsence seizures
  - Comorbid ADHD

Fastenau, Shen, Dunn, & Austin (2008), *J Learning Dis*, 41, 195–207.  
 Sillanpää (2004), *Epilepsy & Behavior* 5, 937–944.

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## Conceptual Model



Modified from Fastenau, Dunn, & Austin (2003), In Rizzo & Eslinger's *Principles & Practice of Behavioral Neurology and Neuropsychology*.

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## First Recognized Seizure Study

- Prospective, 3-Year Longitudinal Design
- Large, Representative, Community-Based Cohort from Multiple Sites
  - 350 affected children
  - 253 Siblings
- Matched, Healthy Sibling Controls
- Comprehensive Data (EEG, MRI, NP, Family, Comorbidities)

Fastenau, Johnson, Perkins, Byars, deGrauw, Austin & Dunn (2009), *Neurology*, 73, 526–534.

Byars, deGrauw, Johnson, Fastenau, Perkins, Egelhoff, Kalnin, Dunn, & Austin (2007), *Epilepsia*, 48(6), 1067–74.

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## Recent Findings

- NP Deficiencies at Onset
- NP Decline
- Modifiable Protective Factors

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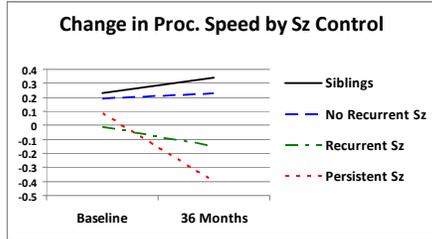
## NP Deficits at Onset in Children

- 2x Risk
  - Dx of Epilepsy
  - Use of AEDs
  - MRI Structural Abnormality or Symp/Crypto etiology
  - Epileptiform activity on initial EEG
- 3x Risk with all four above
- 2x Risk even in absence epilepsy
- Academic achievement not affected at onset.

Fastenau, Johnson, Perkins, Byars, deGrauw, et al. (2009). *Neurology*, 73, 526–534.  
 Byars, deGrauw, Johnson, Fastenau, et al. (2007), *Epilepsia*, 48(6), 1067–1074.

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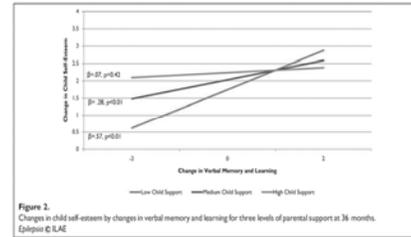
## NP Decline During 1st 3 Years



Fastenau, Johnson, Dunn, Byars et al. (2008). *Epilepsia*, 49(s7), 148-149.  
Bourgeois, Prensley, Palkes, Talent, & Busch (1983). *Ann Neurol*, 14(4):438-44.

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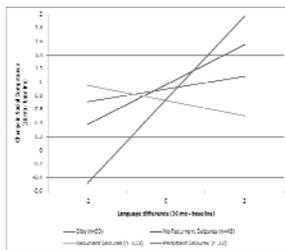
## NP Decline & Self-Esteem



Austin, Johnson, Perkins, Fastenau, Byars, deGrauw & Dunn (2010). *Epilepsia*, 51(10), 2074-2083.

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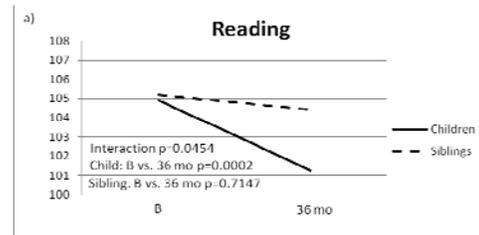
## NP Decline & Social Skills



Byars et al. (in preparation).

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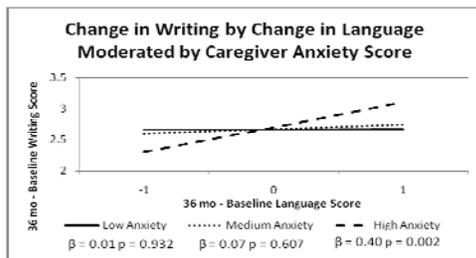
## NP Decline & Academic Delays



Dunn, Johnson, Perkins, Fastenau, Byars, deGrauw & Austin (in press). *Epilepsy & Behavior*.

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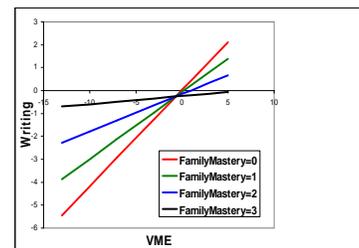
## Family Can Limit Impact of NP



Dunn, Johnson, Perkins, Fastenau, Byars, deGrauw & Austin (in press). *Epilepsy & Behavior*.

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## Family Can Limit Impact of NP



Fastenau, Shen, Dunn, Perkins, Hermann, & Austin (2004). *Epilepsia*, 45, 1261-72.

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## Should cognitive assessment be performed on children newly diagnosed with epilepsy?

Expert Rev. Neurother. 10(6), 839–842 (2010)



**Ingrid Tuxhorn**

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**Elaine Wyllie**

Professor of Pediatric  
Neurology, Director of  
Pediatric Neurology,  
Case Western Reserve  
University, Cleveland,  
OH 44106, USA

"By appropriately screening children with epilepsy who are at risk for cognitive and behavioral dysfunction and referring them early for cognitive assessment, we strongly believe that we may improve the social prognosis of each individual child."

Seizures and epilepsy are frequent chronic neurological disorders in children with varying degrees of severity and a variety of associated disorders or comorbidities. The psychosocial impact of epilepsy on the affected child's and family's function in everyday life may be significant and far-reaching. Chronic uncontrolled epilepsy in children is a significant risk for deficits in cognitive, emotional, behavioral, social and family functioning.

In an ideal world with unlimited resources and expertise the answer to the above question is simply 'Yes'. All children with epilepsy should have at least one cognitive assessment (CA), preferably with other services have entered in child.

Therefore, begging the question – is there a way that we can stratify the risk for cognitive and psychosocial dysfunction for the individual child in the daily clinical setting, short of waiting for a child with epilepsy to develop difficulties at school, in the family or functioning with peers? Are there any tools that can guide us to screen early for comorbidities and earmark the at-risk child to facilitate early referral to suitably qualified experts?

The successful management depends on a well-coordinated interdisciplinary group of experts, which may include the pediatrician, child neurologist and epileptologist, social workers, psychologists, psychiatrists, educators and other therapists who can

Tuxhorn & Wyllie (2010), *Expert Rev. Neurother.* 10(6), 839–842.

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Should cognitive assessment be performed on children newly diagnosed with epilepsy?

psychiatric side effect of acute psychosis with delusions, mood changes, hypomania and mania, anxiety with depressionization or even conversion reactions.

"...children who have epilepsy syndromes associated with cognitive decline should be targeted for early and repeated cognitive assessment."

Indirect effects of AEDs on behavior may be potentiated via the P450 enzyme system, which may be induced by AEDs, such as phenobarbital, primidone, phenytoin and carbamazepine, result-

ing in children with epilepsy. By appropriately screening children with epilepsy who are at risk for cognitive and behavioral dysfunction and referring them early for CA, we strongly believe that we may improve the social prognosis of each individual child.

Tuxhorn & Wyllie (2010), *Expert Rev. Neurother.* 10(6), 839–842.

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## Summary

- Epilepsy is associated with challenges in other areas of functioning
  - Academic/Vocational
  - Mental Health
  - Social
- NP deficits can be present already at onset and contribute to the development & severity of comorbidities.

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## Summary

- Modifiable risks (e.g., sz control, sleep, family) carry implications for treatments to improve NP outcomes
- NP results can assist with prognosis/treatment of comorbidities and guide clinical management (e.g., pt education)
- Health care providers working with this population could benefit from training in how to use NP data in patient care.

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## Individuals with epilepsy should be referred for cognitive assessment:

- when seizures have become medically refractory and surgery is a consideration.
- when they start falling behind in school or have difficulties at work.
- when they complain of cognitive problems.
- soon after the onset of the condition.

## How to Use Neuropsychological Test Results to Improve Academic and Behavioral Outcomes in Schools

December 6, 2010

*Mary Lou Smith, PhD, CPsych*  
*University of Toronto*  
*Hospital for Sick Children*  
*Toronto, Ontario, Canada*

American Epilepsy Society Annual Meeting



## Disclosure

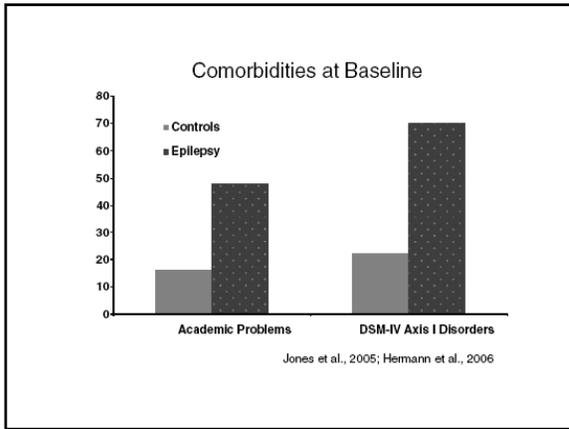
Name of Commercial Interest	Type of Financial Relationship
None	N/A

American Epilepsy Society Annual Meeting



Which of the following is true about children with epilepsy who have academic problems:

- Most are promptly assessed and identified as needing special services within the school system
- Their teachers are usually aware of the learning problems associated with epilepsy
- Many of the learning problems do not fit within known definitions of learning disabilities
- Seizure variables are good predictors of the likelihood of a learning disorder



### Learning Disabilities in Children with Epilepsy

Domain	% with disability
Reading	13 - 32
Written Language	35 - 56
Math	20 - 38

Fastenau et al., 2008. Journal of Learning Disabilities, 41: 195-207

### Seizure Variables and Academic Performance

- Results highly inconsistent
- Cognitive and academic deficits are evident at epilepsy onset

Austin et al., 1999; McNelis et al., 2005; Fastenau et al., 2008; Smith et al., 2002; Mitchell et al., 1991; Oostrum et al., 2005; Seidenberg et al., 1986

## Teaching the Teacher

- Getting beyond the seizures to find the learner
- What do teachers need to know about epilepsy?
- If necessary, develop a written plan for action when a child has seizures in school

## Cognitive Function in Epilepsy

- No epilepsy-specific Neuropsychological profile
- Reflects fact that seizures are a symptom
- Highly individualistic patterns of cognitive strength and weakness
- Must take a comprehensive approach to assessment

Silver CH et al. Arch Clin Neuropsych, 2006; 21:741-744.

## Translating the Neuropsychological Assessment into a School-Based Intervention Plan

- Does the child meet criteria for a specific diagnosis?
  - Autism Spectrum Disorder
  - Intellectual Disability
  - Specific Learning Disability
  - Attention Deficit Hyperactivity Disorder (ADHD)
- If so, are there special classes or programs?

## Academic Function

- Many children do not fit criteria for Learning Disabilities or other diagnoses but have serious academic problems
  - May be problematic for obtaining appropriate services

## Promoting Academic Success

### Classroom Placement:

- ensure appropriate identification and placement
- do not delay identification
- ensure classroom support commensurate with child's strengths and weaknesses (e.g. educational assistant: one-on-one vs. being available for specific needs)
- suggest reassessment when necessary

Kenny TK, Culbertson JL. (1993). Testing Young Children. Pro-Ed: Austin, 1993

## Strategies to Promote Academic Success

- Program for specific type of learning difficulty
  - Language, reading, spelling, math
  - Other cognitive deficits
- Take into consideration special features of epilepsy - e.g. fatigue, variability

Chard DJ et al. J Learn Disabil, 2002; 35:386-406; Gersten et al. Rev Educ Res, 2009; 79:1202-1242; Gersten R, Baker S. Elem School J, 2001; 97:475-500; Humphries T et al. Epil Behav, 2005; 6:405-412; Swanson L. J Learn Dis, 1999.

## Individualized Educational Plan (IEP)

- Type of Interventions
  - Accommodation
  - Modification

## Classroom Environment and Instruction

- Structured
  - clear classroom rules and expectations
  - consistent format to deliver instruction
  - provide schedule for day (one to follow visually)

Humphries T et al. Epi Behav, 2005; 6:405-412

## From Deficit to Intervention

- Examples of common types of neuropsychological deficits in children with epilepsy
- Examples of interventions to address these problems
- ALSO: using the child's STRENGTHS

## Attention

- Inattention
- Sustained attention \*\*\* **MOST COMMON**
- Slowing of reaction time
- Switching focus of attention
- 30-40% have symptoms of Attention Deficit Hyperactivity Disorder (ADHD)

Williams J et al. Epilepsy Behav. 2001; 2(3):217-223  
 Dunn DW, Kronenberg WG. Semin Pediatr Neurol. 2005;12(4):222-8.

## Treating ADHD

- If child has attention problems:
  - Evaluate for ADHD and treat if appropriate
- Stimulant medication
  - Methylphenidate
- Atomoxetine

Feldman et al. Am J Dis Child. 1989; 143:1081-86; Gross-Tsur et al. J Pediatr. 1997;130:670-74; Gucuyener et al. J Child Neurol, 2003; 18:109-112; Hemmer et al. Pediatr Neurol, 2001;24:99-102; Schubert R. Pediatr Neurol 2005;32:1-10.  
 Tan M, Appleton R. Arch. Dis. Child. 2005;90:57-59; Wernicke JF et al. Dev Med Child Neurol. 2007;49(7):498-502.

## Classroom Strategies for Attention Deficits

- If child has attention problems:
  - Environmental modifications – seating in classroom
  - Seek 1:1 assistance
  - Break tasks into small components
  - Physical prompts

Purdie N et al. Rev Educ Res, 2002; 77:61-99

### Processing Speed

- Slowness in thinking, formulating, expressing and carrying out responses
- Can be manifest in
  - motor output
  - cognitive input
  - cognitive output

### Language

- Processing speed
- Organizing ideas for oral or written output
- Anomias - word finding
- Learning and remembering new vocabulary
- Comprehending multi-step commands
- Working memory

### Processing speed and language

- Slow down rate of presentation
  - Allow for extra time to respond
  - Set a realistic expectation for amount of work to be produced (homework too)
  - Have child repeat back instructions
  - Provide instructions in writing
  - Reduce copying from black board
  - Consider speech-language interventions
- Cirrin FM, Gillam RB. Lang Speech Hear Serv in the Schools. 2008; 39: S110-137; Jitendra et al. Excep Child, 2004; 70: 299-322.

### Memory

- Learning - reduced encoding capacity
- Rapid forgetting
- Poor recall - inconsistent retrieval
- Working memory
- Short term vs. Long term memory
- Everyday memory

### If child has memory problems:

- Reduce emphasis on memory-based testing; use alternate forms of evaluation
- Provide lists of key terms
- Pre-teach vocabulary
- Use memory aids
- Always check on child's current knowledge base before teaching new concepts
- Increase repetition of lesson by using other students in the class

### Executive Functions

- Organizational skills
- Planning
- Monitoring
- Decision making
- Time management
- More evident in advanced grades

Meltzer L (ed), Executive Function in Education. NY: Guilford Press, 2007.

### Strategies for Executive Disorders

- Routines
- Breaking work into small tasks
- Using a template, script, checklist
- Plan time lines
- Checking progress along the way
- Teach child to monitor work

Kennedy et al., *Neuropsych Rehab*, 2007;  
Meltzer L (ed). *Executive Function in Education*. NY: Guilford Press, 2007.

### Other Factors that Impact on Academic Performance

- Difficulty making transitions
- Fatigue
- Nocturnal seizures: disrupted sleep leads to restlessness, inattention, distractibility, poor memory consolidation.

Byars AW et al. *Epilepsy Behav.* 2008; 13:607-13,  
Elliott I et al. *Epilepsy Behav.* 2005; 7:664-78,

### Strategies to Promote Academic Success

- Help with transitions
  - Pre-warn of change using provided schedule
  - Use key words or phrases to shift attention
  - Signal in advance that a change is coming
- When possible, adapt class scheduling to deal with problems of fatigue

### Consideration of Non-cognitive Correlates of Academic Underachievement

- Low SES
- Self-esteem
- Perceived control
- Negative attitudes
- Seizure-related factors
- Behavioral and social factors

Sturniolo MG, Galletti F. *Arch Dis Child* (1994), 70: 424-428.  
Ostrom KJ et al. *Brain* (2005), 128, 1546-1555.  
Beghi M et al. *Epilepsia* (2006), 47(S2):14-18.

### Behavior Problems

- Rules/expectations must be clearly defined
- Structure
- Monitoring
- Clear consequences
- Pay attention to good behaviour

Ylvisaker et al. *Brain Injury*, 2007; 21:769-805.

### Seizure-Related Behavioral Strategies

- Altered behavior pre or post seizure
  - inform school re altered behaviors
  - ↓stimulation and academic workload during this period
- AED-related behavioral changes
  - new AEDS: inform school staff
  - monitor AEDS - improvement in seizure control outweighs negative effects on learning or behavior

### Model to Address Behavioral Challenges

- Collaborative Problem Solving Approach
  - Behavioral approach/philosophy that can guide all interactions with children

“Children do well if they can”

- Skill deficit vs. motivation deficit
- Not manipulative/lazy instead forgetful, tired, worn out, “in a fog”
- Set child up for success rather than reacting to problems

(Greene & Ablon, The Explosive Child. 2005)

### Behavioral Strategies

- Define how responsible child should be held for dysregulated behaviour
- Define behavioral differences between “won’t and can’t”
- Use alternative behavioral techniques
- Talk to the child
- Explore role of psychiatry/psychotropic meds, support of behavioral therapists with school board

### Conclusions

- Academic challenges are multi-faceted
- Intervene early ... things can get more complicated with time

Which of the following is true about children with epilepsy who have academic problems:

- a. Most are promptly assessed and identified as needing special services within the school system
- b. Their teachers are usually aware of the learning problems associated with epilepsy
- c. Many of the learning problems do not fit within known definitions of learning disabilities
- d. Seizure variables are good predictors of the likelihood of a learning disorder

## Role of Neuropsychological Functioning in Vocational Rehabilitation

December 5, 2010

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## Disclosure

No Disclosure.

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Which of the following is *not* a major focus of  
the NP Eval in Vocational Rehabilitation?

- a) Makes critical referral and accommodation recommendations.
- b) Further clarifies the brain-related site of dysfunction.
- c) Provides baseline profile of cognitive strengths and limitations.
- d) Can provide perspective on educational needs viability.
- e) Provides perspective on the trajectory / transition steps to work.

## Presentation Overview

- Importance of Neuropsychological Assessment in Epilepsy Vocational Rehabilitation
- Making Neuropsychological Assessment Available
- Neuropsychological Findings as a “Driver” in the Vocational Rehabilitation Process
- Overestimation / Underestimation Issue
- Critical NP Recommendations

## Employment is a Major Concern for Adults with Epilepsy!

- Unemployment is 25%.
- Unemployment is 50% for those with poor control.

Epilepsy Foundation, 2010

## Recent Study at the University of Washington Epilepsy Center

- 30.7% Full-Time employment, 15.3% Part-Time, 47.8% Unemployed
- 73.7% Uncontrolled Seizures
- 59.3% AA Degree +

Fraser et al., 2010

### Importance of Neuropsychological Assessment (Tertiary Centers)

- 23% of patients at the Epilepsy Center of Michigan had epilepsy only, brain impairment – largest additional disability.

Rodin, Shapiro, & Lennox (1977)

### Importance of Neuropsychological Assessment (Tertiary Center), cont'd.

- Unemployed: 64% of NP tests outside normal limits.
- Underemployed: 53% of NP tests outside normal limits.
- Employed: 22% of NP tests outside normal limits.

Batzel et al. (1980)

### Importance of Neuropsychological Assessment (Tertiary Center), cont'd.

Marked neuropsychological impairment if:

- $\geq 75$  lifetime generalized tonic clonic, or
- Incidence of status epilepticus

Dodrill (1986)

### Importance of Neuropsychological Functioning for Job Retention at One Year

Best Discriminators of Job Maintenance:

- Motor speed
- General cognitive efficiency (digit symbol)
- Total tests, outside normal limits

Fraser et al. (1986)

### Common Areas of Cognitive Concern in Epilepsy

- Attention
- Memory / Learning
- Speed of Mental Processing
- Executive Functioning
- Cognitive Flexibility

Hermann et al. (2006, 2008); Oyegbile et al. (2004); Rausch et al. (1997)

### If Vocational Goals are Salient and Brain Impairment is Suspected, the Questions Are:

- Was neuropsychological assessment done and available?
- Was cognitive status stable and assessment sufficient at that time?

- OR -

- How can we get it done appropriately now?  
– DVR funding, etc.

## Neuropsychologist Needs:

- Medical, psychosocial, and vocationally relevant records.
- A clear listing of questions related to functional vocational, training, or ADL concerns.
- Materials related to the vocational questions such as job descriptions or information from the Department of Labor's O.NET (<http://online.onetcenter.org/>) about jobs of concern.

## If Brain Impairment is Established, the Neuropsychological Report Becomes a Driver in the Work Access Effort

- Baseline profile of an individual's strengths and limitations.
- Focus on the potential impact of the impairment on different work functions/tasks.
- Provide perspective on the trajectory/transition steps to work.
- May provide perspective on educational needs/viability.
- Makes critical referral and accommodation recommendations.

## Over-Estimation / Under-Estimation as to Vocational Functioning Issue

### Overestimate:

- Real World can have multiple demands to include divided attention, time pressures, interpersonal issues, demands for accuracy vs. controlled, one-to-one testing situation.

### Underestimate:

- Rote, "overpracticed" behavior, real world cues at the workstation.

■Uomoto (2000); Barisa and Barisa (2001)

## Examples

### Underestimation:

- Roy, the Welder; and
- Mike, the Coil Winder

### Overestimation:

- Walt, the Customs Screener

## Neurologist can help us discern cognitive vs. emotional issues impacting vocational focus:

- PTSD
- Non-epileptic seizures
- Axis I and Axis II disorders
- Malingering, primary/secondary gain, etc.

## Neuropsychologist Can Assist with Diverse Critical Referrals

- Speech and language pathologist for cognitive aids.
- Assistive technology for accommodations implementation.
- Appropriate type of psychotherapy – CBT, problem solving therapy, social skills, behavioral management, etc.

### Neuropsychologist Can Assist with Bridge To Work Recommendations

- DOL 215-hour non-paid job tryout.
- Paid (DVR) or non-paid internship.
- OJT (on-the-job training) mechanism.
- Tailored placement.
- Tailored placement with supports.

### Neuropsychologist Can Suggest Work-Related Accommodations

- Procedural
- Workstation Modifications
- Assistive Technology
- A Combination of the Above

### Cognitive Accommodations

- **Procedural** – Begin work early (schedule), sticky notes, daily organizer (memory), performing in sequence, job coach, co-worker as tutor, etc.
- **Work Station** – Organizing carrels/color-coded, office placement, etc.
- **Assistive Technology** – Headphones, specialized software, audio (voice) recorder, FAX, digital camera/video, text-to-speech systems, etc.

### Interpretation of NP Findings for Vocational Planning

- Clear summary of strengths and limitations in one page.
- Client audio records sessions.
- Strengths and limitations framed within the job/academic goal context.

### Interpretation of NP Findings (cont'd.)

- Open dialogue – Questions welcomed!
- Have client paraphrase.
- Significant others invited to session as beneficial.

The Ultimate Goal is that the Cognitive Strengths and Concerns are Synthesized into the Vocational Rehabilitation Plan with Client “Buy In.”

Which of the following is *not* a major focus of the NP Eval in Vocational Rehabilitation?

- a) Makes critical referral and accommodation recommendations.
- b) Further clarifies the brain-related site of dysfunction.
- c) Provides baseline profile of cognitive strengths and limitations.
- d) Can provide perspective on educational needs viability.
- e) Provides perspective on the trajectory / transition steps to work.

## Role of Neuropsychological Functioning (NP) in Psychiatric Assessment and Treatment

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## Disclosure

Name of Commercial Interest	Type of Financial Relationship
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Nothing to declare	NA
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## Children with epilepsy should be referred for cognitive assessment:

- If their families are disorganized
- If their mothers are depressed
- If they complain of sibling rivalry
- If they have a family history of epilepsy

## Outline: Children and Adults

- Psychopathology, epilepsy, and NP
  - Behaviors suggesting need for NP?
- Psychiatric implications of NP findings
  - NP deficits requiring psychiatric evaluation?
- Treatment of psychopathology
  - Type of treatment?
  - Impact on NP deficits?

## Cognition and Psychopathology in Children *Without* Epilepsy

- Psychopathology related to cognition
  - Intellectual disability
  - Subtle cognitive deficits
- Wide range of psychiatric diagnoses
  - Disruptive disorders
    - ADHD, Oppositional Defiant, Conduct Disorder
  - Mood and anxiety disorders
  - Combined

(Dickstein et al., 2010; Mueller et al., 2009; Vasa et al., 2007; Wood et al., 2010)

## What behaviors suggest need for NP testing?

- School and Homework
  - "Boring" ADHD, LD, depression, anxiety
  - Inattentive Above + AEDs, seizures
  - Avoidant -----"-----
  - Irritable -----"-----
  - Disorganized Above + AEDs, seizures
  - Somatic Above + NES

(Garland et al., 2009; Keeton et al., 2009; Rubin et al., 2009)

### What behaviors suggest need for NP testing?

- Within the Family
  - Irritable
  - Argumentative
  - Oppositional
  - Feelings hurt, cries easily
  - Poor self esteem
  - Sibling rivalry and aggression

### What behaviors suggest need for NP testing?

- Peers
  - Fights (verbal, physical)
  - Withdrawal
  - Social perception
    - “No one likes me”
    - “No one wants to play (hang out) with me”
    - “Everyone is mean, stupid”

### What behaviors suggest need for NP testing?

- Adolescents R/O Depression, LD
  - Sleep increase/decrease
  - Appetite impaired
  - Risk taking and/or self injurious behavior
    - SCHOOL FAILURE = RISK FOR SUICIDE
  - Ideation
  - Acts

(Asarnow et al., 2008; Peters et al., 2008)

### Pediatric NP Deficits: Psychiatric Implications

- Memory (working, short-, long-term)
  - ADHD, LD, anxiety, depression
- Attention
  - Above diagnoses
- Language (basic, naming, reading, discourse)
  - Above diagnoses
- Executive function
  - ADHD

**+ SOCIAL SKILL DEFICITS**

(Franklin et al., 2010; Kaslow et al., 1984; Mattison and Mayes, 2010; McQuade et al., 2010; Vasa et al., 2007)

### Pediatric NP Deficits: Psychiatric Implications

- Slowed processing speed (Tian et al., 2010)
  - Anxiety, depression (Ladouceur et al., 2005)
  - AEDs
    - Polytherapy, high doses (Hessen et al., 2007)
    - Topiramate (Arif et al., 2009)
  - Subclinical seizures?

### NP Deficits in Pediatric Epilepsy: Psychiatric Implications

- NP deficits, depression, and poor self esteem
  - New onset
  - Follow-up of 36 months
    - Depression, poor self esteem, cognitive decline
      - Seizures
    - Risk/Protective factors
      - Family function, parent education
      - Parent anxiety

(Austin et al., 2010)

## Cognitive Dysfunction in Pediatric Epilepsy: Psychiatric Implications

- Cognitive biases
- Depression (Dunn et al., 1999)
  - Negative attitude
    - Towards epilepsy
    - Family functioning
  - External locus of control

## Pediatric Epilepsy, Psychopathology, and NP: Conclusions

- Behavior changes indicate need for:
    - Psychiatric evaluation
    - NP testing
- AND:
- NP deficits
    - R/O psychiatric diagnoses

## Adult Epilepsy: Psychopathology

- Depression (Barry et al., 2008; Kanner et al., 2010)
- Anxiety disorders (Barry et al., 2008; Kanner et al., 2010)
- Bipolar disorder (Ettinger et al., 2005; Mula et al., 2010)
- Interictal dysphoric disorder (IDD) (Blumer et al., 2004; Mula et al., 2010)
- Psychosis (Trimble et al., 2010)
- NES (LaFrance, 2008)

## NP in Adult Psychopathology No Epilepsy

- **Depression** (Gottlib & Joorman, 2010)
    - Executive function
    - Memory
    - Slowing
  - **Cognitive Biases** (Mathews & McLeod, 2005)
    - Dysfunctional attitude
    - Selective bias for information
    - Difficulty disengaging
    - Rumination
- BUT:**
- Cognitive control?

## NP in Adult Psychopathology No Epilepsy

- **Anxiety** (Basso et al., 2007; Castaneda et al., 2008)
  - NP deficits
    - Executive function
    - Psychomotor slowing
  - Cognitive biases (Craske et al., 2009)
    - Attention to threatening stimuli

## NP in Adult Psychopathology No Epilepsy

- Psychosis (Tan, 2009)
  - Executive function
  - Working memory
- NES (Prigatano & Kirlin, 2009)
  - Subjective overrating of cognitive difficulty
    - Word finding
    - Memory associated with anxiety

## Adults: Epilepsy, Psychopathology and NP

- Treatment resistant epilepsy (Mula et al., 2007; Petrovski et al., 2010)
  - Psychopathology
  - AED adverse behavioral and cognitive effects
  - NP deficits
- Depression and epilepsy
  - QOL (Boylan et al., 2004; Gilliam et al., 2004)
  - Subjective cognitive complaints (Lik et al., 2009; Marino et al., 2009)

## Adults : Epilepsy, Psychopathology and NP

- Confounding of depression symptoms/AED effects
  - Behavior
    - Sad, irritable
    - Withdrawn
    - Suicidality
    - Anhedonia
    - Insomnia
    - Poor appetite
    - Distractible
  - NP deficits
    - Slow processing
    - Attention
    - Memory
    - Executive function

## What adult behaviors suggest NP testing?

- Depression and anxiety symptoms
- Subjective complaints
  - Cognition
    - Memory
    - Attention
    - Organization
  - Work
  - Social
  - Family

## Treatment with Pediatric Psychotropic Drugs: NP Effects

- ADHD
  - Attention, WM (Gonzales-Heydich et al., 2010; McAfee et al., 2008; Yoo et al., 2009)
- Depression
  - Processing speed, WM, perception of memory, cognitive biases?
- Bipolar disorder
  - ? (Salpekar et al., 2006)
- Anxiety
  - Processing speed?

## Pediatric Psychiatric Drug Treatment

- Psychotropic drugs
    - Improved psychiatric symptoms
  - OR:
  - No change/worse psychiatric symptoms + NP
    - Anxiety, child depression, NES
- R/O NEED FOR EDUCATIONAL INTERVENTION

## Pediatric Psychiatric Treatment: Implications for NP

- Individual therapy
  - Important re NP deficit related poor self esteem
  - CBT with/without educational intervention
    - No data re NP deficits
      - Anxiety
      - Depression (Martinovic et al., 2006)
      - NES

### Psychiatric Treatment: Implications for NP

- Family therapy
  - Role of family functioning
    - Academic achievement
    - Change over time
      - Mental health
      - NP deficits
- Educational therapy/remediation

### Psychiatric Treatment Modalities: Adults

- Psychopharmacological
  - Depression SSRIs, SNRIs
  - Anxiety SSRIs, SNRIs, Benzos
  - Bipolar disorder AEDs, lithium
  - IDD SSRIs, SNRIs
  - Psychosis Neuroleptics
- CBT
  - Depression (McLaughlin & McFarland, 2010) - Anxiety
  - NES (La France et al., 2009)

Children with epilepsy should be referred for cognitive assessment:

- A. If their families are disorganized
- B. If their mothers are depressed
- C. If they complain of sibling rivalry
- D. If they have a family history of epilepsy

Role of Neuropsychological Functioning in Patient Education and Coordination  
December 2010

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Barrow Neurological Institute  
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American Epilepsy Society Annual Meeting



## Disclosure

Nothing to disclose

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## Question

What is the added value of neuropsychological test results to overall well-being in patients with epilepsy?

- Provision of patient information facilitates the development of skills necessary to self-manage their own chronic conditions
- Added knowledge will add to information that is well established in the nursing literature
- A different focus is needed that points away from cognition
- Nurses have rarely played a role in the patients overall well-being in health care

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## Objectives

- Determine nurse's perception of knowledge related to an individual's cognitive limitations and strengths
- Identify ways to increase the knowledge and confidence level of neuroscience nurses in relation to consultations and multidisciplinary interventions
- Discuss educational interventions on psychological testing in epilepsy related to patient education and care
- Tailor patient education and care to the individual's cognitive limitations and strengths

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## Nursing Standard of Practice

- Nurses are the key providers of patient education in most healthcare settings
- Health teaching and health promotion are part of the standards of nursing practice (American Nurses' Association 2004)
- Provision of patient information facilitates the development of skills to manage chronic conditions

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## Goals

- Having nurses teach patients and their families about epilepsy is essential
- Achievement of sound knowledge base encourages and reinforces better communication, increases patient satisfaction and improves overall decision making

(Kwan, Ridsdale, & Robins 2000, Ridsdale, Kwan, & Cryer, 2000, and Ridsdale, Kwan, & Morgan, 2003).

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## Identification of learning needs

Nurses who care for patients with epilepsy:

- Self-perceptions of knowledge of Neuropsychological testing have not been examined/measured
- Survey assessments identify and measure nurse's learning needs regarding knowledge about Neuropsychological testing
- Education traditionally has focused on pathophysiology of disease process
- Medical models focus on care delivery, policies and procedures and technical skills (Witter, 2005).

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## Closing Gaps

- Development of a study with the purpose of assessing nurse self-perception of knowledge related to Neuropsychological testing
- Design the project with the secondary purpose of determining if an educational intervention can increase knowledge and confidence on topic

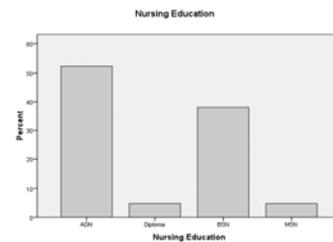
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## Study Design, Method and Participation

- Quasi-experimental design using volunteer participation of pre and post interventions of itemized written surveys
- Two different site approved IRB studies
- Registered nurses in a level one academic medical center; neuroscience unit
- Data analysis-Predictive Analytic Software Statistics

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## Participants



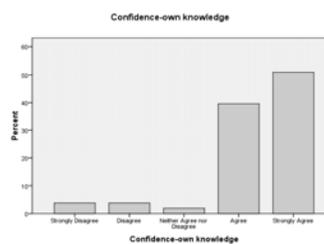
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## Confidence in own knowledge

- Initial questions on survey addressed nurses' overall confidence in the purpose of Neuropsychological testing and the general areas that are covered

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## Nursing confidence of own knowledge



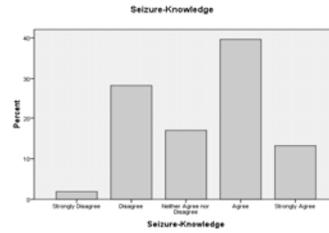
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### Seizure Knowledge

- I am confident that I can recognize the type of seizures that are associated with an increase in psychiatric morbidity compared to other types of seizures

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### Nursing importance of understanding seizures



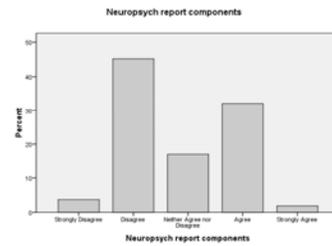
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### Awareness of Neuropsychology report

- I am aware of the components that make up a Neuropsychology report (Neuropsychological report?)

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### Awareness of the Neuropsychological Report



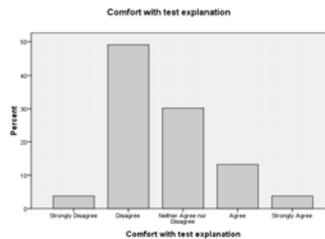
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### Comfort in explaining battery of tests

- I would feel comfortable explaining the different battery of tests that patients receive during their Neuropsychological assessment

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### Comfort in test explanation



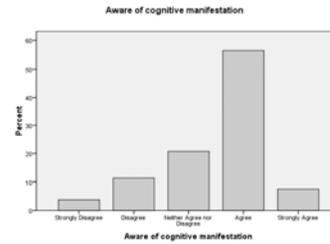
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### Awareness of cognitive dysfunction

- I am aware of the various ways in which cognitive dysfunction may manifest itself in Epilepsy

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### Awareness of cognitive dysfunction



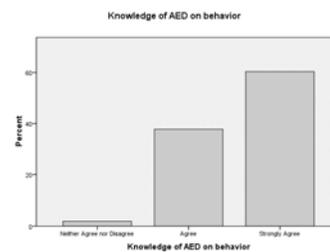
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### Awareness of medication effect

- As a nurse I feel that I need to be aware of the effects of antiepileptic drugs on patient behavior

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### Awareness of medication effect



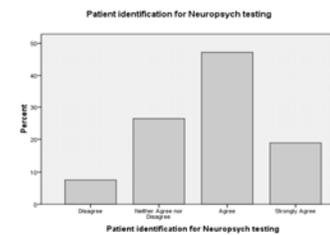
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### Recognition of benefits of Neuropsychological testing

- I am confident that as an RN I could recognize when my patient would benefit from Neuropsychological testing

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### Recognition of patients benefits



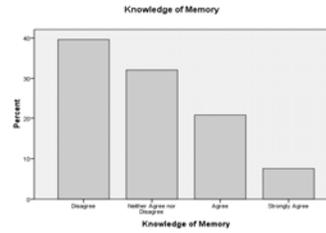
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### Knowledge of memory

- I am confident that I could define which part of my patient's memory is one of the most frequently affected cognitive domain in patients with Epilepsy

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### Definition of cognitive domain affects of memory



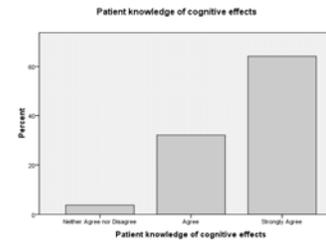
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### Importance of patient and family awareness

- I believe that patients and their families need to know and understand the cognitive effects that epilepsy can have and how it can affect their lives

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### Patient and family awareness



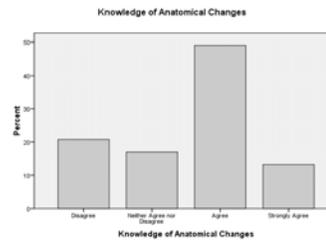
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### Awareness of brain atrophy and anatomical changes

- I am aware of the way brain atrophy and anatomical changes in epilepsy can affect a patient with epilepsy cognitive impairment

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### Awareness brain atrophy and anatomical changes in epilepsy



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### Closing Gaps

- Understanding a patient’s cognitive deficits and learning capabilities/style is critical to effective patient communication/education.
- 2009 report on standards for Patient-Centered Care to the Joint Commission supports this initiative

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### Education Plan

- “Turn them on” to learning and content
- Create an active, learner-centered environment which captures attention through case study scenarios and/or role playing

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### Education plan

- 30 minute educational in-service
- Neuropsychologist & RN collaboration
- Plan based on results of needs assessment (survey responses)
- Provided training multiple different times
- Pre-Post education surveys
- Education to community centers-school nurses, clinic nurses, etc.

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### Educational approach to patients and families

- Projects focusing on ways to facilitate healthcare communications between patients with Epilepsy and their family/caregivers/surrogates
- Literacy skills, cognitive capacity and communication addressed with both written materials and teach back approach
- Clinic, school, hospital and community settings

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### Question

What is the added value of neuropsychological test results to overall well-being in patients with epilepsy?

- a. Provision of patient information facilitates the development of skills necessary to self-manage their own chronic conditions
- b. Added knowledge will add to information that is well established in the nursing literature
- c. A different focus is needed that points away from cognition
- d. Nurses have rarely played a role in the patients overall well-being in health care

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## Case Presentation

December 5, 2010

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## Disclosure

Cyberonics

Speaker's Bureau

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## Case: SR

- 39 yr RHM
- 12 years of education, no LD, but needed reading assistance
- Epilepsy onset late teens
- Worked in construction and a cook (both were discontinued due to seizures)
- Incarcerated early 20's and fell out of bunk
- Divorced with a 7 year old son. Currently has a fiancée
- Currently on Social Security Disability

## Case: SR

- Past AED's included Levetiracetam, Phenytoin, Carbamazepine, and Lamotrigine
- Currently on Valproic Acid and Oxcarbazepine
- Pre-surgical work-up included Video-EEG, MRI, Neuropsych Evaluation, PET scan, and Wada

## SH

- Video-EEG: Seizure semiology included type #1: dizzy-lip smacking-facial twitching-secondary GTC and type #2 staring with post seizure aggressiveness
- EEG demonstrated left temporal onset for type #1 and PNES for type #2
- Type #1 frequency was 2-3 per month
- Type #2 frequency was 2-4 per week

## SH

- MRI: normal
- PET: reduced uptake along the inferior and lateral margins of the left temporal lobe
- Neuropsych: ('07) FSIQ is 79, PIQ is 90, VIQ is 74 and ('09) scores were the same. His MMPI-2 demonstrated significant emotional distress, depression, preoccupation with health concerns.

## SH

- Wada: Left hemisphere dominant and memory significantly better in the left hemisphere.
- Recommendations: Supportive therapy with possible pharmacological interventions

## SH

- Following extensive counseling for depression and PNES, ambulatory EEG for 2 weeks demonstrated 3 left temporal seizures
- Grid placement for language mapping was done. A left temporal lobectomy sparing the hippocampus was done.
- 6 month post-op Neuropsych demonstrated no decline in verbal memory and a slight decline in naming.

## SH

- Currently he is interested in returning to school to learn a trade.
- He continues to take AED's
- He is currently driving