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Mapping the Mind: Neuropsychological Evaluation and Tracking Progress After Epilepsy Surgery to Inform School Interventions

Rosalia Costello, Psy.D and Karen Evankovich, Ph.D.
Pediatric Neuropsychologists

UTHA Pediatric Neurosciences Program
Department of Neurology

Dell Medical School | The University of Texas at Austin

Disclosures

- We have no actual or potential conflict of interest in relation to this program/presentation.

Part 1: Before the Surgery – Why Do I Need Neuropsychology?



What is Neuropsychology?



What are "cognitive skills" and what do they have to do with surgery?



Do seizures impact thinking and reasoning skills?



How does Neuropsychology inform surgical decisions?



How do Neuropsychologists integrate so many pieces of the puzzle to create meaningful insight into the child's functioning?

Neuropsychology's Role



Brain + Behavior



Lateralization/localization



Functional neuroanatomy;
neuroplasticity



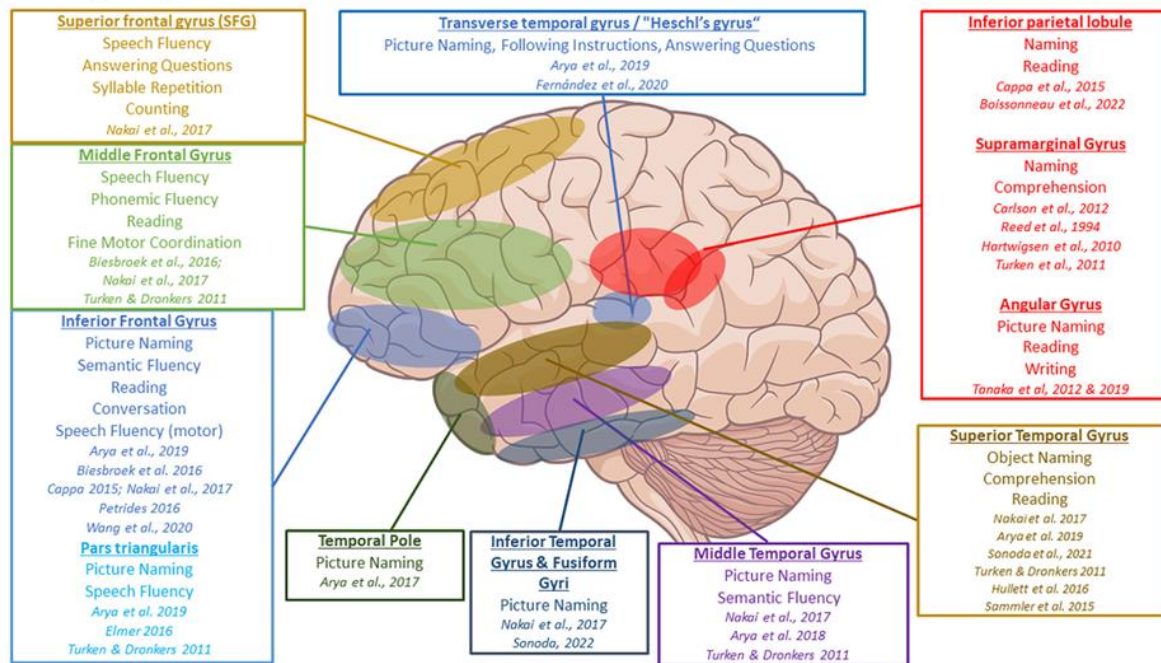


FIGURE 2 Visual representation of child ESM language findings and corresponding functions. In Nakai et al., 2017, speech arrest was observed upon active bilateral stimulation of the inferior precentral gyri.



Attention



Working Memory

Processing speed

Sustained Attention

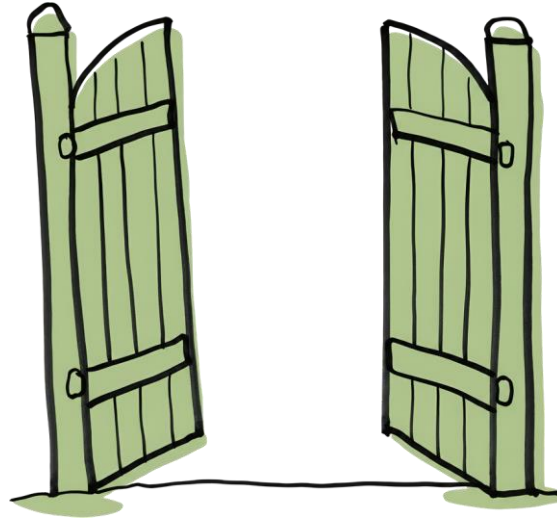
Executive Functioning

Related diagnoses (highly comorbid in epilepsy): ADHD

ATTENTION GATE



INFORMATION



MEMORY





Memory



Learning

Short-term

Long-term

Recognition



Language



Expressive language

Speech

Receptive language

Bilingualism

Related diagnoses:
Language Disorder;
Childhood Onset
Fluency Disorder;
Aphasia



Visual Spatial



Visual spatial relationships
(reconstructing puzzles,
mental rotation)

Visually-based fluid
reasoning (pattern
perception, sequential
reasoning)



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Motor Skills



Speeded fine motor
dexterity (contribution to
lateralization)

Graphomotor control

Grip strength

Related diagnoses:
dysgraphia

Academic Achievement



Reading

Writing

Math

Related diagnoses: Specific Learning Disorders in reading (e.g., dyslexia profile), written expression, or mathematics





Adaptive Functioning



Activities of daily living – at home and at school

Conceptual vs. Practical Routines

Culturally-based family goals, expectations



Mood/ Psychiatric



Anxiety

Depression

Behavior

Therapies



Biopsychosocial Factors



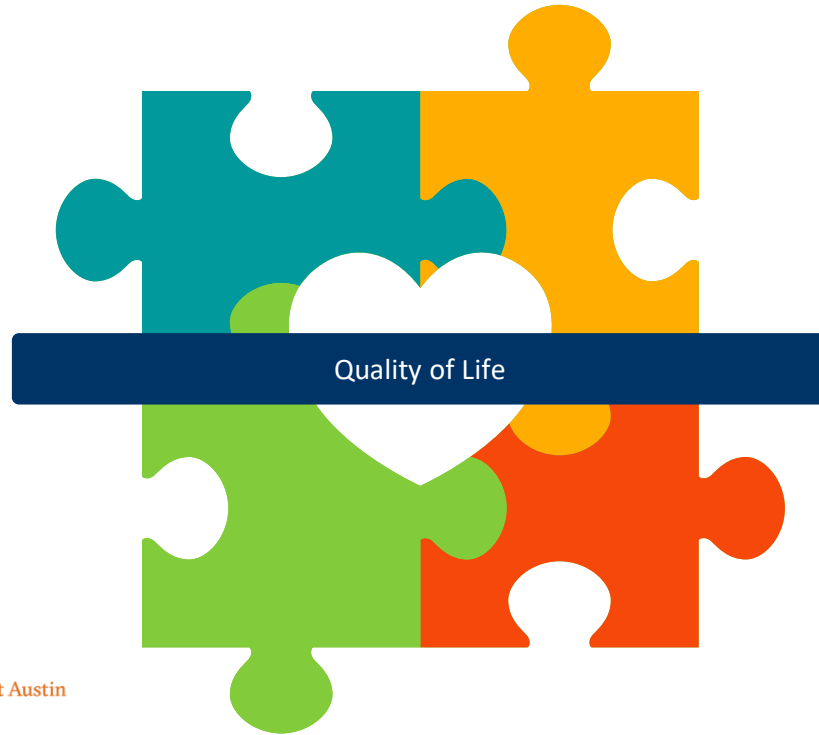
Social functioning and
supports

Systems in which the
child lives

Family members

Assembling the Puzzle







Part 2: The Surgery Is Over—Now What?



Will my child continue to make progress?



Could new learning difficulties emerge later?



Why is school becoming harder even though the seizures are controlled?

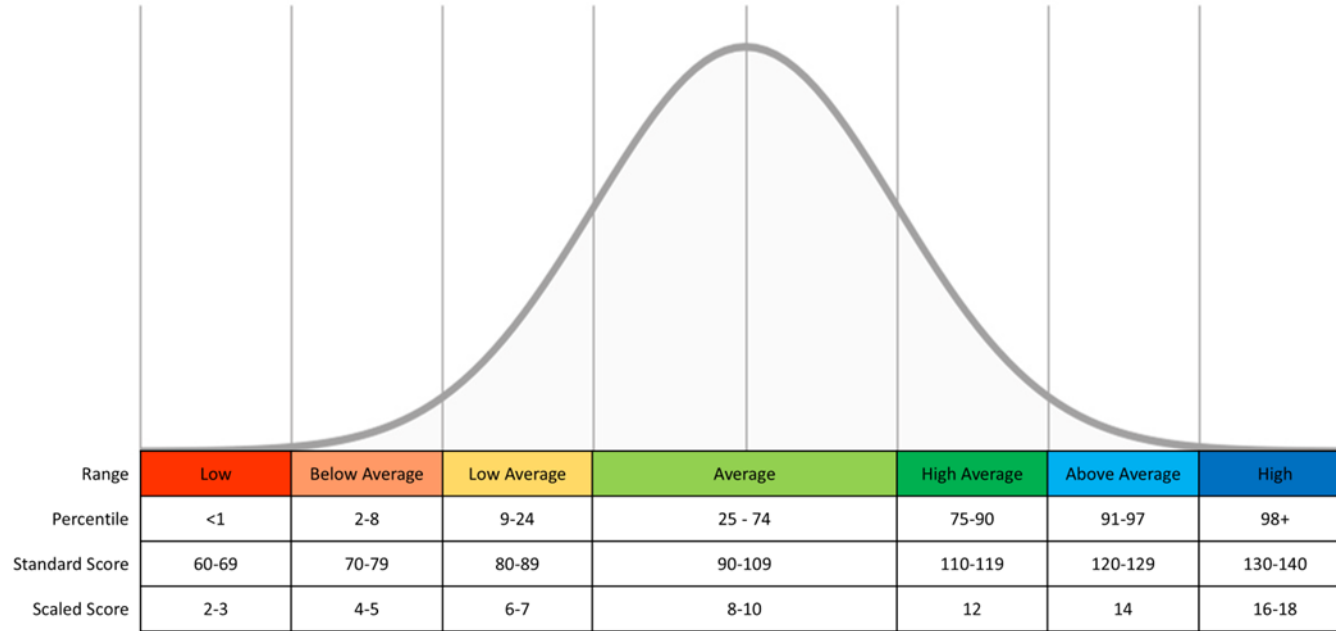


How often should my child be re-evaluated?

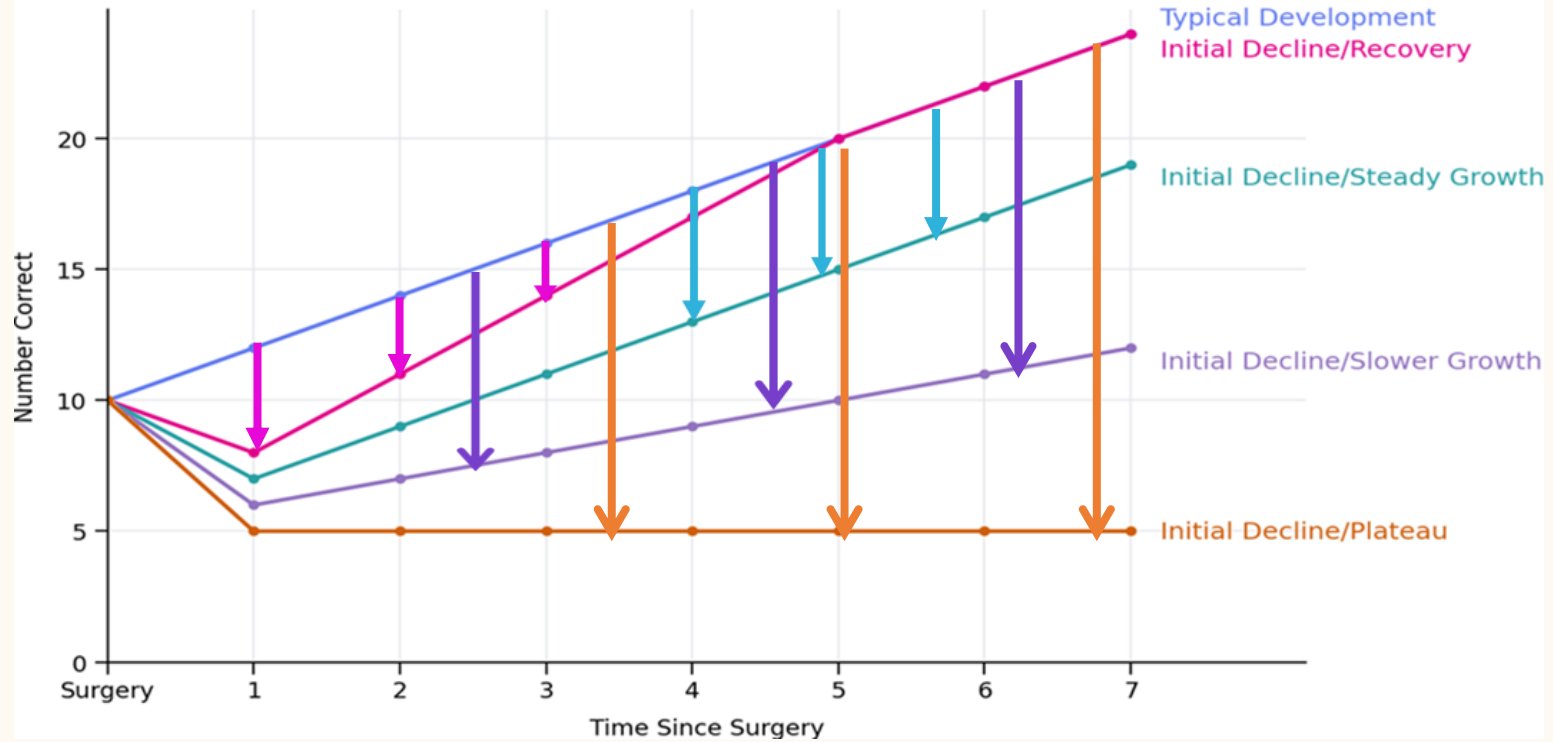


What services should I ask for at school?

Standard Curve



Developmental Trajectories



Other Reasons School May Seem Harder



Increased School Demands

WHAT MIGHT BE HAPPENING

The expectations of school have changed, not your child.

- Middle and high school bring more complex material, more homework, multiple teachers.
- Higher grades require more executive functioning

WHAT IT MEANS

Skills that worked fine before may not be enough now, which can bring existing challenges into view.



Up-and-Down Days

WHAT MIGHT BE HAPPENING

Some days go well; others are much harder. Attention, fatigue, sleep, stress, medication effects, or seizure activity and recovery can all affect performance day to day.

WHAT IT MEANS

Your child's underlying abilities are still there — it's their access to those skills that fluctuates.



Both patterns are common and manageable.



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READING

Cognitive skills that support reading success



LANGUAGE

Supports decoding, vocabulary, and reading comprehension.



ATTENTION

Keeps readers focused and engaged with text.



WORKING MEMORY

Connects ideas while reading.



PROCESSING SPEED

Supports fluent and efficient reading.



LONG-TERM MEMORY

Builds understanding through prior knowledge.



EXECUTIVE FUNCTIONS

Uses strategies to monitor and understand text.



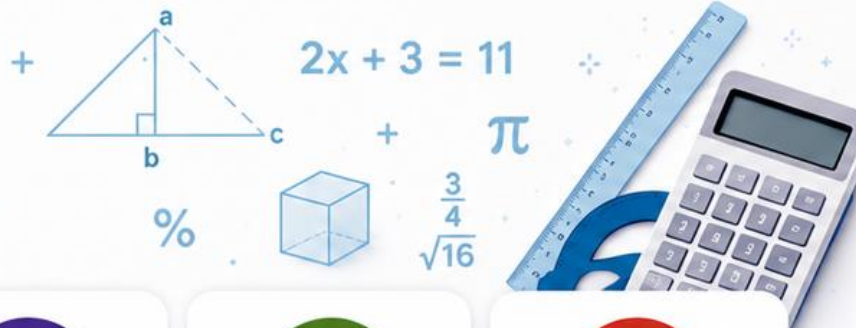
Reading depends on many cognitive skills working together.

Difficulties with reading often reflect changes in cognitive skills—not intelligence or effort.



MATH

Cognitive skills that support mathematics success



LANGUAGE

Understands math vocabulary and word problems.



ATTENTION

Focuses on important details and avoids errors.



WORKING MEMORY

Holds numbers and steps while solving problems.



PROCESSING SPEED

Retrieves math facts quickly and accurately.



LONG-TERM MEMORY

Stores math facts, formulas, and procedures.



EXECUTIVE FUNCTIONS

Plans, monitors, and checks problem solving.



Strong math skills rely on more than memorizing facts.

Math challenges may arise from underlying cognitive changes, even when concepts are understood.





WRITTEN EXPRESSION

Cognitive skills that support writing success



Aa



LANGUAGE

Generates ideas
and uses
precise vocabulary.



ATTENTION

Stays focused
throughout the
writing process.



WORKING MEMORY

Organizes ideas
and keeps writing
on track.



PROCESSING SPEED

Supports quick
retrieval of words
and ideas, freeing
mental resources
for composing.



LONG-TERM MEMORY

Provides spelling,
grammar, and
writing knowledge.



EXECUTIVE FUNCTIONS

Plans, organizes,
revises, and
edits writing.



FINE MOTOR

Supports physical
actions needed for
handwriting, letter
formation, and
keyboarding.



Writing is one of the brain's most demanding academic tasks.

*Writing is often one of the last academic skills to fully recover
because it relies on many cognitive processes at once.*





Accessing Educational Supports

Different needs require different supports.



Does your child have a medical condition?



Does it affect learning and educational performance?



Determine the right support.



Section 504 Plan

Best for students who need accommodations



Changes *how* a student accesses learning (removes barriers)



Student learns the same curriculum as peers

Examples:

- Extended time
- Preferential seating
- Reduced distractions
- Copies of notes
- And more

OR



Individualized Education Program (IEP)

Best for students who need specialized instruction



Changes *how* a student is taught (provides specialized instruction)



Instruction is individualized to meet unique learning needs

May include:

- Specialized instruction
- Reading or math intervention
- Speech-language therapy
- Occupational therapy
- Related services
- And more



Medical Diagnosis ≠ School Eligibility

A medical diagnosis (such as epilepsy) *does not automatically qualify* a student for services.

Schools determine eligibility based on *how the condition affects learning and educational performance*.



Continuum of Educational Services

The right support, in the right place, for as long as needed.



**MORE
SUPPORT**
More restrictive
environment



**LESS
SUPPORT**
Less restrictive
environment

1



**Hospital School /
Homebound**

Instruction provided in the hospital
or at home when a student cannot attend school.

2



Special Education Classroom
(with opportunities for
mainstreaming)

More intensive support in a specialized classroom
with time in general education when appropriate.

3



**Pull-Out Instruction /
Resource Class**

Student receives targeted instruction
outside the general education classroom
for part of the day.

4



**General Education Class
with Push-In Support**

Special education teacher or service provider
comes into the classroom to support learning.

5



**General Education Classroom
with or without accommodations**

Student learns in the general education classroom
with supports, with or without accommodations.



Placement is Flexible



Services can change
as needs change.



The goal is growth,
independence, and
success.



Students should be in the
least restrictive environment
that meets their needs.



Our Goal

Provide the least amount of support necessary
to help students succeed—while planning
for more independence over time.





School Accommodations That Match Cognitive Needs



★ *The best accommodations address the underlying cognitive skill—not just the academic subject.* ★

ATTENTION



Preferential seating



Reduced distractions during independent work and testing



Break long assignments into smaller parts



Frequent check-ins for understanding



Scheduled movement or brain breaks

EXECUTIVE FUNCTIONING



Planner or assignment notebook support



Graphic organizers and checklists



Chunk long-term projects into smaller deadlines



Teacher modeling and organizational support



Copies of notes and posted assignments

MEMORY



Written directions in addition to verbal instructions



Repetition and review of new information with frequent opportunities to practice and retrieve information



Study guides and graphic organizers



Access to class notes or outlines



Access to word banks and multiple choice tests when appropriate

PROCESSING SPEED



Extended time for assignments and tests



Reduced workload without reducing learning goals



Extra response time during class discussions



Access to keyboarding or speech-to-text when appropriate



Limit timed activities when speed is not being measured



The best accommodation is one that **removes a barrier** while maintaining high expectations for learning.





School Accommodations That Support Academic Skills

★ Different supports help your child access learning and show what they know. ★



READING



Access to highlighted text or digital text



Audiobooks or text-to-speech



Pre-teach vocabulary and key concepts



Graphic organizers for comprehension



Alternate assessments (e.g., oral responses, projects, retells)



MATH



Use of graph paper for organization



Use of manipulatives, number lines, or visual models



Step-by-step problem breakdowns



Calculator for computation when appropriate



Reduce the number of problems without reducing the skill being taught



Allow time for explanations without rushing



WRITTEN EXPRESSION



Use of keyboarding or speech-to-text



Word prediction software or spelling support



Sentence starters, frames, or outlines



Shorten written assignments without lowering expectations



Allow oral responses or multimedia projects



Accommodations do not lower expectations—they **remove barriers** so your child can **succeed**.





What We Hope You Remember



Neuropsychological evaluation is a journey—not a one-time event.

1

Development Continues



Children's brains continue to grow throughout childhood and adolescence.

2

School Demands Change



As expectations increase, new strengths and challenges may emerge.

3

Repeat Evaluations Matter



Follow-up evaluations help distinguish development, slower progress, and new concerns.

4

Understanding Comes Before Intervention



Evaluations explain how cognitive skills work together to support or interfere with learning.

5

Strengths Matter



Strengths provide the foundation for intervention and future success.

6

The Right Supports Make a Difference



Results guide school accommodations, therapies, and home strategies.



Our Goal:

Understand *how* your child learns, recognize *strengths* and *challenges* over time, and ensure the *right supports* at the *right time* for success at home, school, and daily life.





Thank You

FOR YOUR ATTENTION



Thank you for giving us the **opportunity** to share this information with you today.



ACKNOWLEDGEMENT

We would like to acknowledge our colleague, **Dr. Rosario DeLeón**, the third neuropsychologist on our pediatric epilepsy team, whose expertise and assistance were invaluable in preparing this lecture.



Thank you again!

We appreciate your time and commitment to your child's success.



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Caregiver Survey: Your Voice Matters

Working together to support children and families.



Our team is conducting a brief caregiver survey to understand the needs of families before and after surgery.



Your feedback will help us improve the support, resources, and services available to children and families throughout their journey.



If you are interested, use this QR code to access the survey in English or Spanish.



If you want to complete the survey on your computer, email karen.evankovich@austin.utexas.edu



Your participation is completely voluntary.
There is no right or wrong answer.
We simply want to hear your perspective.

Su participación es completamente voluntaria.
No hay una respuesta correcta o incorrecta;
simplemente queremos escuchar su perspectiva.