



# CULTIVATING BRILLIANCE IN NEURODIVERGENT STUDENTS

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# ABOUT ADHD&U



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# WHAT IS ADHD?

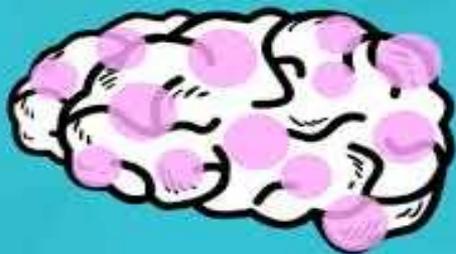
- A neurodevelopmental disorder that affects about 9.6% of school-aged children
- Developmentally inappropriate level of inattention, hyperactivity and/or impulsivity
- Significantly impacts **many aspects** of development, such as learning, social, motor, and coping skills
- No cure; typically persists into adulthood
- Highly genetic

# INFO ABOUT CHILDREN WITH ADHD

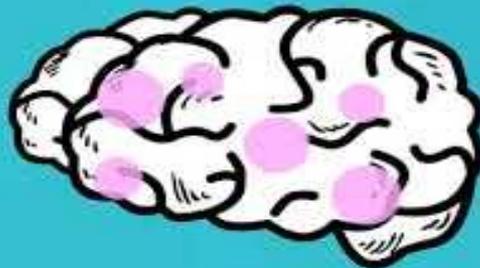
- Risk factors for ADHD:
  - Genetics
  - Low birth weight
  - Prematurity
  - Alcohol, tobacco or drug use during pregnancy
  - Exposure to toxins, like lead
  - Brain injury
- Untreated ADHD are at much greater risk for behavior disorders and learning delays
- Children with ADHD typically cost 5 times as much to raise as neurotypicals
- Much more impacted by teacher/student relationship than neurotypicals
- 50% social difficulties
- Highly creative
- Independent-minded
- Focus better than neurotypicals on areas of interest

# NEUROTYPICAL VS ADHD BRAIN

**Neurotypical**

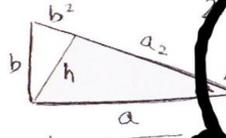


**ADHD**



STRUCTURAL

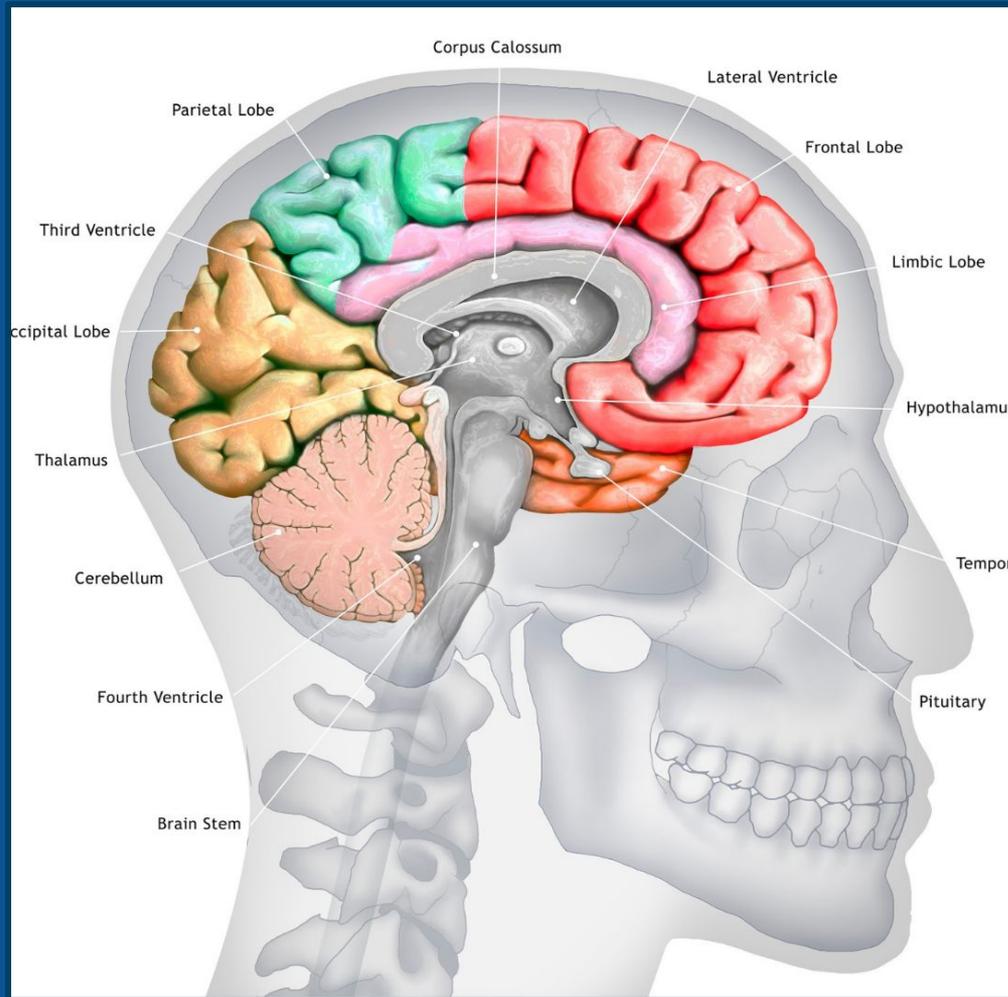
$$\int x = \frac{1}{2} x^2 - c \left( \frac{1}{2} x^2 + c \right) = \left( \frac{1}{2} x^2 \right) + (c) = x$$
$$\left( \frac{a}{b} \right)^m = \frac{a^m}{b^m} \quad f(x) = a(x-x_1)(x-x_2)$$
$$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$$
$$F = \frac{ma}{\sqrt{1 + \frac{1}{4} \frac{a^2}{b^2}}} + \frac{m \cdot (u^2/c^2)}{(\mu^2/c^2)^2} \quad Q \quad mc \Delta t \quad \text{H}_2\text{N}_2\text{O}$$
$$\lim_{\Delta y \rightarrow 0} \frac{f(x_0 + \Delta y) - f(x_0, y_0)}{\Delta y} \quad \Delta = \sqrt{p(p-a) \cdot (p-b) \cdot (p-c)}$$
$$2+2=4 \quad \Delta y$$
$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$x + bx + cx = 0$$
$$h = \sqrt{a \cdot x \cdot b} = \frac{xb}{c}$$
$$E = mc^2$$
$$a^2 - b^2 = (a-b)(a+b)$$
$$f(x) = a(x-x_1)(x-x_2)$$
$$\left( \frac{a}{b} \right)^m = \frac{a^m}{b^m} \quad \sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$$
$$C(x) = a(x-x_1)(x-x_2) \quad \frac{b^2 + c^2 - bc}{a}$$
$$\text{Cl} - \text{C}_6\text{H}_4 - \text{NH}_2 - \text{C}_6\text{H}_5$$
$$z = \frac{1}{\sqrt{2} \pi} e^{-\frac{1}{2} x^2}$$
$$\cos \alpha + \cos \beta = 2 \cos \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$$
$$\log a^b = b \log a \quad \int B \cdot dA = D$$
$$\sin \alpha + \sin \beta = 2 \sin \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$$
$$z = \frac{1}{\sqrt{2} \pi} e^{-\frac{1}{2} x^2} \quad 2+2=4 \quad E = mc^2$$
$$\int_0^{\infty} \frac{\text{erf}(\sqrt{x})}{e^x} dx = \frac{\sqrt{2}}{2}$$
$$\tan \alpha = \frac{y_2 - y_1}{x_2 - x_1}$$
$$Q = mc \Delta t$$



CHEMICAL



# STRUCTURAL DIFFERENCES

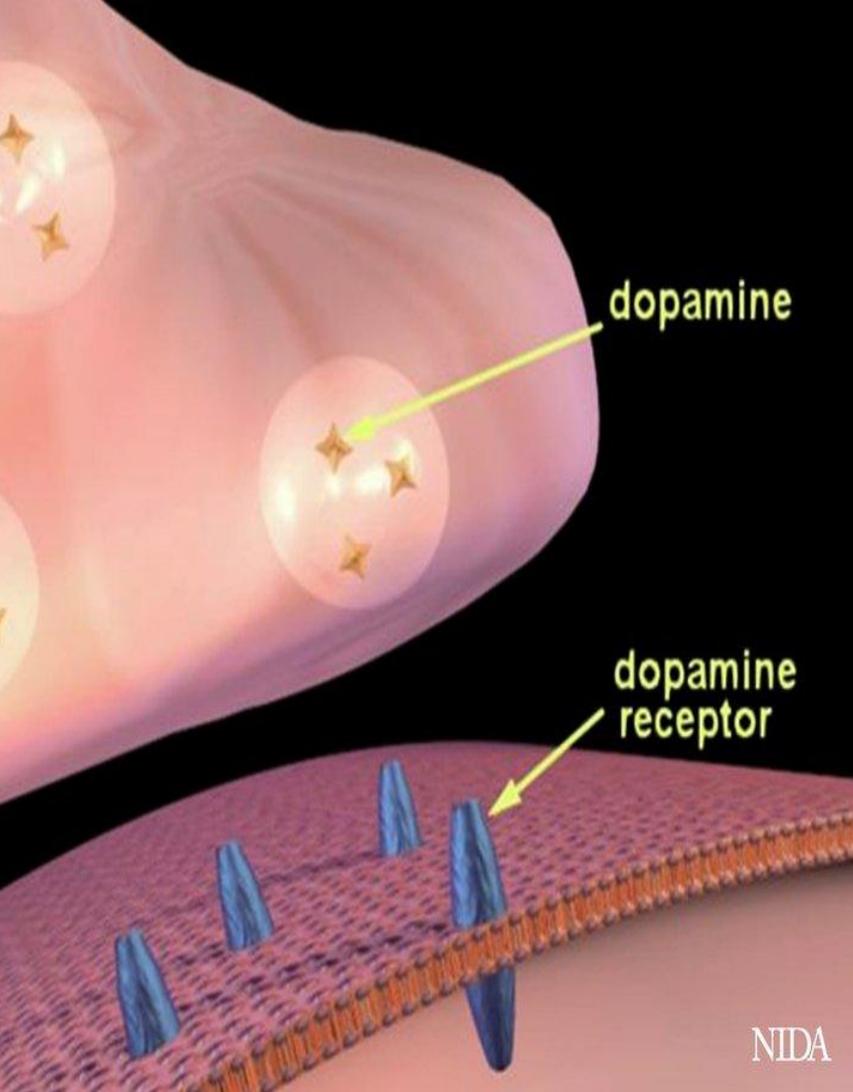


- **Smaller in certain regions**
  - Frontal lobe
  - Hippocampus (temporal lobe)
  - Amygdala (limbic system)
  - Corpus callosum
- **These size differences lessen over time.**

## CHEMICAL DIFFERENCES

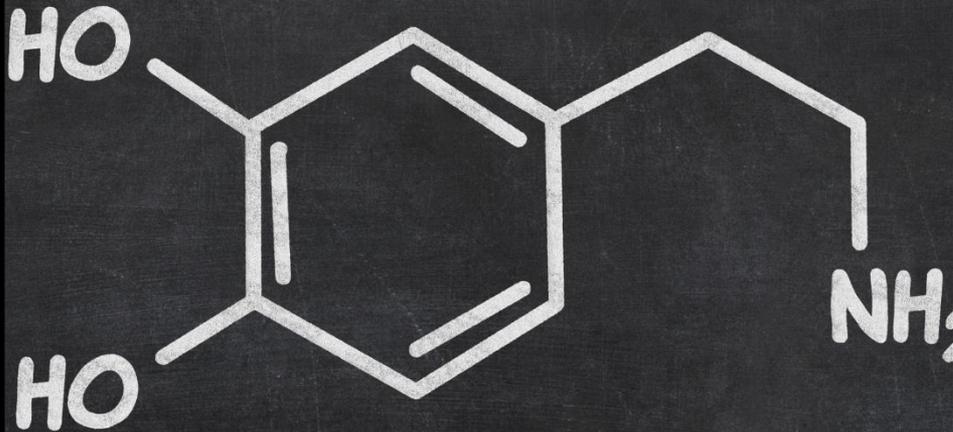
### Impaired Neurotransmitter activity in Four Primary Regions of Brain

- Frontal cortex
- Limbic System
- Basal Ganglia
- Reticular Activating System



## DOPAMINE'S ROLE IN ADHD

# Dopamine



- Some researchers have found that the neurons in people with ADHD have lower concentrations of proteins called dopamine transporters.
- The concentration of these proteins is known as dopamine transporter density (DTD).
- Thus, lower levels of DTD may be a risk factor for ADHD.
- One 2015 study found that the dopamine transporter gene, DAT1, may influence ADHD-like traits.
- Other studies have found that other neurological differences, such as the amount of gray matter in the brain, accounts more for ADHD symptoms than dopamine levels.



## SYMPTOMS OF ADHD IN CHILDREN

- Struggle to track directions
- Extreme forgetfulness
- Avoids tasks requiring effort (except related to interests)
- Time-blind
- Grades are inconsistent with perceived intelligence
- Fidgety
- Poor coping
- Seems young for age

# COMMON MYTHS ABOUT ADHD

- ADHD is caused by **poor parenting**
- ADHD is **overdiagnosed**
- ADHD **isn't a real** medical condition
- Kids with ADHD can't **EVER** focus
- Kids usually **outgrow** ADHD
- All kids with ADHD are hyperactive

# BEHAVIORS I OFTEN SEE IN CHILDREN WITH ADHD IN CLINICAL SETTINGS

- **Repeated questions about time (e.g., How much longer?)**
- **Hyperactivity**
  - **Excessive talking**
  - **Tipping back in chair**
  - **Frequently leaves seat**
  - **Asks to use the bathroom**
  - **Consumes excessive water or food if required to sit still**
- **Hypersensitive to noise**
- **Appears pained by harder tasks**
- **Frustrates easily**
- **Requires frequent repetition of instructions**
- **Needs help slowing down due to careless errors**

# WHAT KIDS WITH ADHD WISH WE KNEW ABOUT THEIR LEARNING



## HOW DOES ADHD DIFFER IN DSM-IV VS DSM-V?

- Symptoms still need to be evident in more than one context, but don't have to impair functioning in multiple contexts.
- Descriptors of ADHD in DSM-V now include developmentally appropriate examples of symptoms.
- Teens (uncomfortable sitting still extended periods vs "driven like a motor")
- DSM-IV, ADHD couldn't be diagnosed if a child also had autism, whereas DSM-V, these diagnoses can both be given to the same person.
- Age of onset criteria (several inatt/hyp symptoms present prior to 12-years-old vs 7-years-old).



## DIAGNOSES OFTEN ASSOCIATED WITH ADHD IN CHILDREN

- Anxiety Disorders
- Depression
- Oppositional Defiant Disorder
- Learning Disabilities
  - Dysgraphia (writing)
  - Dyslexia (reading)
  - Dyscalculia (math)

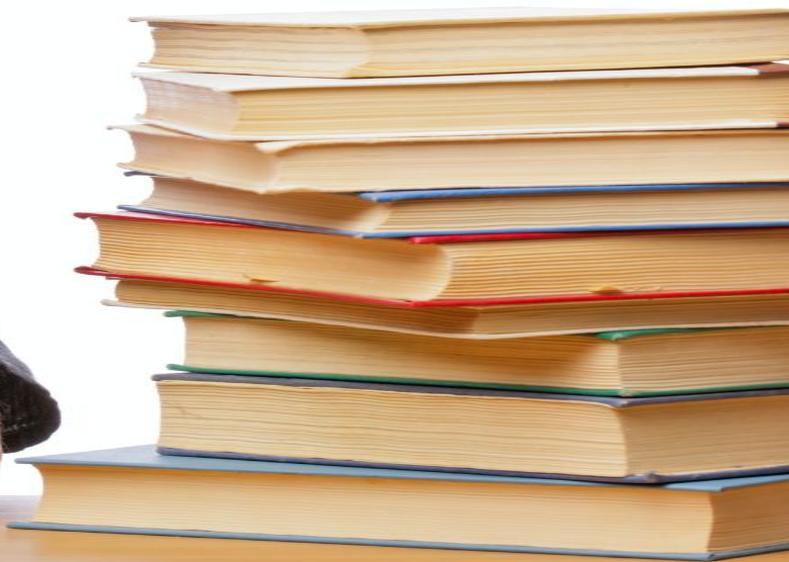
# WHAT IS A SPECIFIC LEARNING DISORDER ACCORDING DSM-5?

- Neurodevelopmental disorder that impedes **learning** and **academic skills**, as indicated by the presence of **at least one** of the following **6 symptoms persist 6 months despite interventions**:
  - Inaccurate or slow and effortful word reading
  - Difficulty understanding the meaning of what is read
  - Difficulty with spelling
  - Difficulty with written expression
  - Difficulty mastering number sense
  - Difficulty with math reasoning
- The affected academic skills are substantially and quantifiably below age-mates.
- The learning difficulties begin during school-aged years but may not fully manifest until academic demands exceed individual's capabilities.
- The learning difficulties are not better accounted for by intellectual disabilities or visual or auditory challenges or other challenges (e.g., mental health disorder).

## PRIMARY CHANGES RE: LEARNING DISORDERS IN DSM-5

- Elimination of the IQ-achievement discrepancy requirement replaced with four criteria (A - D).
- Changed from subtypes of LD (Reading Mathematics, Written Expression Disorder) to one overarching category.
- Qualifying cut-off scores are now arbitrary because academic skills are measured on a continuum. As such, clinicians are advised to use "clinical judgment."
  - Below 16th % could indicate SLD.
  - Below 7th % most consistent with SLD.
- By contrast to DSM-IV, psychometric data alone were now insufficient for a DSM-5 diagnosis of SLD.
- A much closer collaboration is required between educators, clinicians, and parents to provide access to school records and information from psychoeducational and clinical assessments.
- Can vary in severity (mild, moderate, severe)

Letters mean  
nothing to  
me.



# WHAT IT'S LIKE TO HAVE DYSLEXIA



# SPECIFIC LEARNING DISORDER WITH IMPAIRMENT IN READING: DSM-5

- Three subcomponents of the reading disorder are differentiated:
  - word reading accuracy
  - reading rate
  - fluency and reading comprehension
- Common manifestations of Reading Disorder
  - Difficulty decoding single words
  - Difficulty learning letter-sound correspondence
  - Poor phonemic awareness
    - Struggle to understand that spoken words are made of indiv. sounds
  - Highly associated with poor spelling
- Symptoms of LD change across the lifespan
  - **Preschool**
    - difficulty learning nursery rhymes
    - mispronounce words
  - **Elementary School**
    - Fail to recognize letters
    - Can't read simple words
    - Odd reading errors (e.g., read 'big' as 'goat')
    - Can't learn spatial concepts (e.g., left from right)
  - **Middle School**
    - Skip parts of multi-syllable words
    - Poor comprehension
    - Slow readers
    - Avoid reading
  - **High School**
    - Mastered decoding words, yet reading slowly with great effort
    - Poor comprehension
    - Struggles with foreign language

slow reading

avoid reading

mispronounce words while reading

poor spelling

struggle to retrieve words

difficulty remembering people's names

difficulty remembering directions

anxiety in academic settings

# Reading Disorder VS Dyslexia



- Dyslexia is a reading disability, but not all reading disabilities are dyslexia.
- Need to understand what specifically is causing the reading delay
- Dyslexia is primarily a phonological processing disorder.
  - Difficulty translating the meaning of letters into sounds
  - Separating sounds
  - Combining multiple sounds into words
- 70 - 80 percent of those who struggle with reading have dyslexia
- Other 20 percent struggle to read for other reasons
  - Visual tracking problems
  - Language comprehension
  - Brain injury

# WHAT TO DO IF YOU SUSPECT A CHILD IS DYSLEXIC?

- Schedule appt with their GP to r/o vision or hearing problem.
- Meet with the child's **Special Education Needs Co-ordinator (SENCO)** to discuss concerns and desire for testing.
- If feasible, seek a private evaluation
  - [Groves Academy](#)
  - [Learning Disabilities Assoc of MN \(LDA MN\)](#)
  - Pediatric neuropsychologist
  - Educational psychologist
- [Contact MN Dept of Education/ Dyslexia](#)
- [Simon Technology Center at PACER](#) offers free individualized training sessions on how to use educational assistive technology
- [Orton-Gillingham of Minnesota](#)
  - Reading camps
  - Listings of tutors
  - Teacher trainings

# SPECIFIC LEARNING DISORDER IMPAIRMENT IN MATHEMATICS DSM-5

- **Dyscalculia** is now referred to as Specific Learning Disorder (SLD) with an impairment in Mathematics
  - Developmental Dyscalculia impairment in “number sense”
  - Theory damage to parietal lobe of brain helps understand quantities
  - Equal among genders
  - Often associated with other LD's
- Symptoms of Dyscalculia change across lifespan
    - **Preschool**
      - Biggest, smallest
      - Recognize numbers
      - Order numbers
    - **Elementary School**
      - Counting money
      - Tell time
      - Concepts (greater, less)
    - **Middle School**
      - Keeping score
      - Writing, sequencing #'s
    - **High School**
      - Charts/ graphs
      - Calculating percentages

# WHAT TO DO IF YOU SUSPECT A CHILD HAS DYSCALCULIA?

- Follow previously mentioned suggestions for dyslexia (e.g., request special education evaluation)
- Seek private evaluation
  - [MN Neuropsychology](#)
- [Seek specific accommodations for teen](#)
  - Provide chart of math facts
  - Let student use calculator
  - Allow extra time on tests
  - Allow student to keep list of steps for complex math problems
- Seek tutoring
  - Teacher's office hours
  - Private tutor
  - Online computer programs
    - Khan Academy
    - [Free math practice problems](#)

# SPECIFIC LEARNING DISORDER IMPAIRMENT IN WRITTEN EXPRESSION DSM-5

- **Dysgraphia** is now referred to as SLD with an impairment in Written Expression
- Difficulty putting one's thoughts on paper; problems with spelling, grammar, and punctuation
- Highly comorbid with ADHD
- Often associated with weaknesses in executive functioning and visual- and fine-motor impairment (**dyspraxia**)

- Symptoms of Dysgraphia change across lifespan
  - **Preschool**
    - Struggle to copy letters
    - Can't write name
    - Often resist drawing
  - **Elementary School**
    - Poor spelling
    - Intermix upper and lower case letters
    - Frequent erasing
    - Inappropriately sized/ spaced letters
  - **Middle School**
    - Avoid/ Argue about writing
    - Complain of hand pain
  - **High School**
    - Can't organize writing
    - Paucity of written content

# WHAT TO DO IF YOU SUSPECT A CHILD HAS DYSGRAPHIA?

- Follow previously mentioned suggestions for dyslexia (e.g., request special education evaluation)
- Seek private evaluation
  - [Groves Academy](#)
  - [Learning Disabilities Assoc of MN](#)
  - Pediatric neuropsychologist
  - Educational psychologist
- Encourage improving keyboarding
- Teach student voice-activated computerized programs
  - Google-voice
  - [Dragon Naturally Speaking](#)
- Accommodations & modifications
  - Modify written work (e.g., one paragraph vs two)
  - Offer student a sample written assignment as model
  - Student a copy notes, etc.
- Encourage student to work with teacher & turn in assignment in chunks
- Don't count off for spelling
- Offer student alternative assignment
- Private Tutoring
  - [Orton-Gillingham of Minnesota](#)
    - Teach structure of writing
    - Improve handwriting
    - Teach spelling rules/ skills

# NEUROPSYCHOLOGICAL TESTING



# WHAT IS NEUROPSYCHOLOGICAL (NP) TESTING?

- **Specialized evaluation that assesses how the brain functions**
- **Series of tasks designed to measure specific aspects of brain functioning, such as:**
  - Verbal reasoning
  - Visual reasoning
  - Memory
  - Attention
- **Assessment of emotional, social and behavioral functioning**
- **Clarifies strengths and challenges**
- **Provides detailed recommendations to improve your child's functioning**

# WHAT TO EXPECT IN COMPREHENSIVE PEDIATRIC NP EVALUATION?

➤ **In-depth parent or caregiver interview:**

- Developmental history
- Medical History
- Current symptoms
- Academics
- Social skills

➤ **Several hours of testing, which will vary depending on client's age and functioning level.**

➤ **For younger children, testing can be described as playing games**

➤ **Feedback session:**

- Review Testing findings
- Review Recommendations
- Inclusion of adolescent depends

# WHAT IS THE DIFFERENCE BTW NP EVALUATION AND A SCHOOL EVALUATION?

## > Neuropsych Evaluation

- Psychologist has specialization in neuropsychology
- More in-depth testing (e.g., attention, memory, psychological)
- Focuses more on understanding **why** a client is functioning a certain way

## > Psychoeducational Evaluation

- School psychologists
- Primary focus understand child's learning style from educational perspective
- Identifying child's strengths and challenges in a school environment
- Focuses more on identifying **what** is happening in school

## WHEN SHOULD WE REFER OUR CLIENTS FOR NEUROPSYCHOLOGICAL TESTING?

- **If your client has:**
  - Complex learning issues, such as a lag in reading.
  - A developmental disability or genetic disorder.
  - A history of neurological insults or diseases, such as seizures, head injury or loss of consciousness.
  - Symptoms of a neurodevelopmental disorder, such as inattention, impulsivity, or disordered development (e.g., stereotypical motor mannerisms, sensory differences)
  - A psychiatric condition, such as DMDD, Bipolar Disorder, psychotic features.



## BENEFITS OF NP TESTING

- **Change trajectory of a child or adolescent's life**
  - Clarifying diagnosis
    - Change treatments
      - Meds
      - Therapies
      - School Services
        - 504 vs IEP
- **Independent/ unbiased way to track a child's progress every few years.**
  - Dyslexia
    - Phonetic decoding
    - Fluency
      - Change interventions as needed.



SUPPORT STRATEGIES FOR NEURODIVERGENT CHILDREN

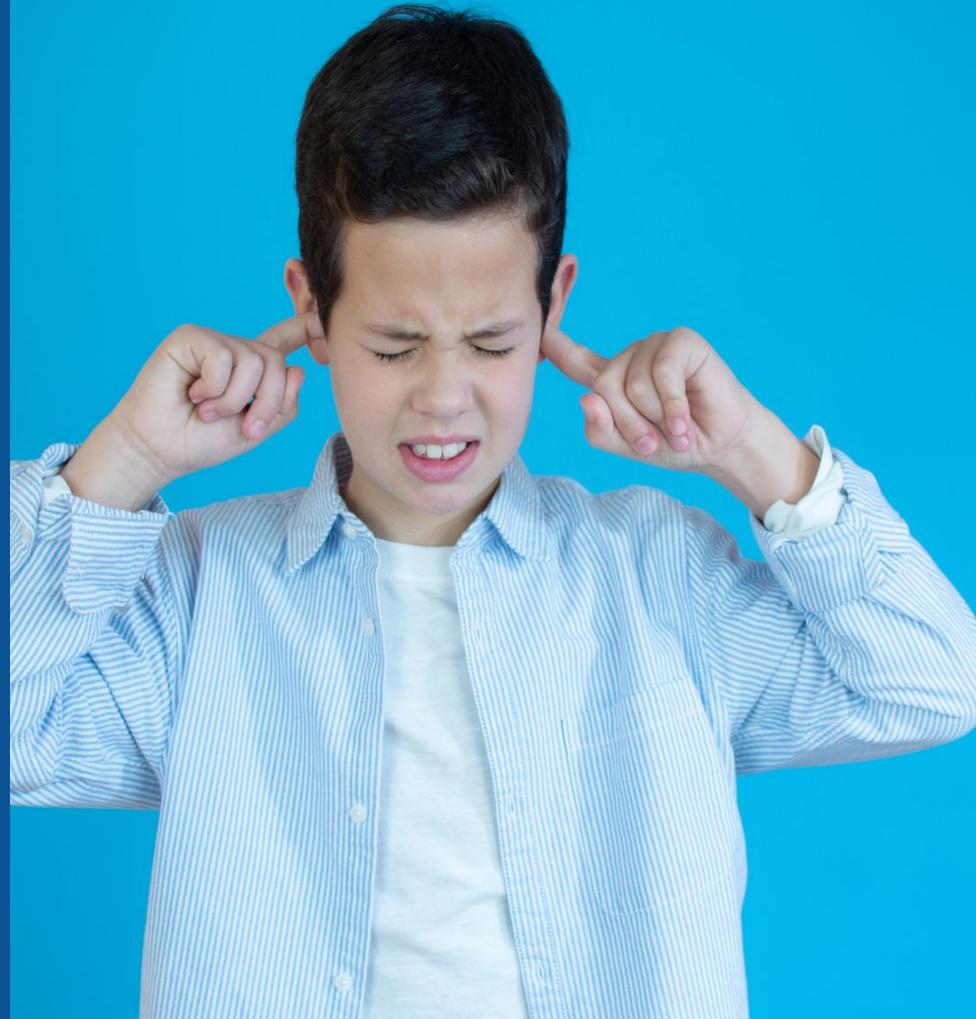
# DETECTIVE MINDSET AS A CLINICIAN



# COMPASSIONATE LISTENING



SENSORY  
DIFFERENCES AND  
ADHD





## HELP STUDENTS CREATE SENSORY SURVIVAL BACKPACK

- Noise- cancelling headset
- Roll-on aromatherapy oils
- Fidgets
- Chewing gum
- Lip balm
- Pocket-sized tissues
- Wet wipes
- Snacks
- Tiger Balm

# HELP CHILDREN TO DEVELOP RELAXATION TECHNIQUES



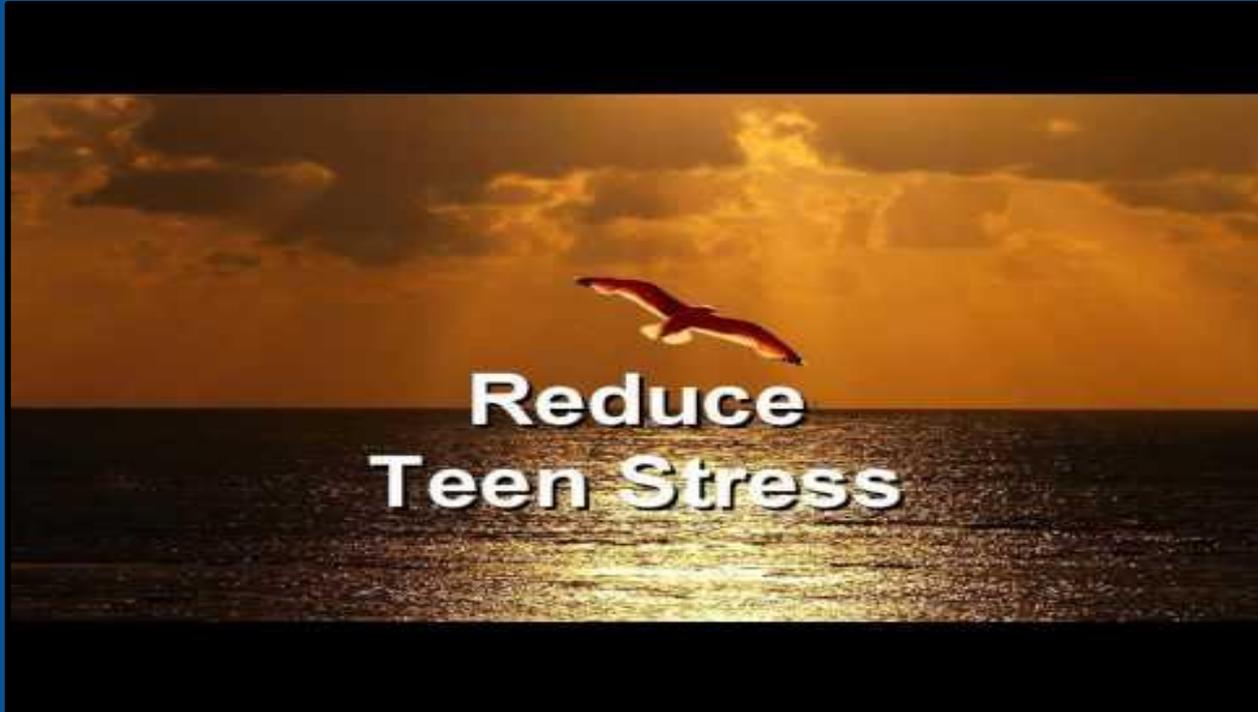
- **Meditation**
  - **Changes brain (neuroplasticity)**
    - Hippocampus and Prefrontal Cortex
    - Default Mode Network
    - Dopamine
  - **Psychological Benefits**
    - Improve mood
    - Decrease anxiety



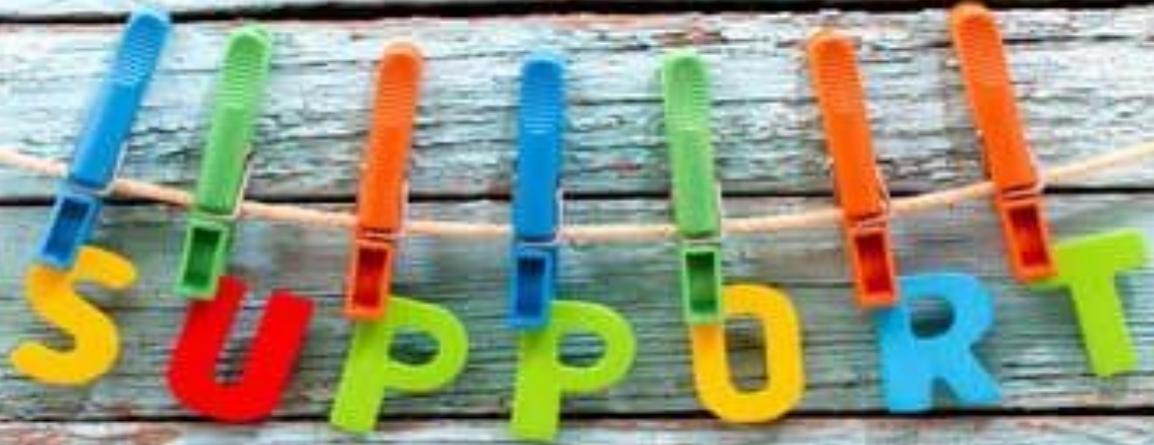
# MEDITATION TIPS FOR NEURODIVERGENT CHILDREN

- Don't worry if your mind chatters.
- Start small
- Create a comfortable sensory-supportive space
- Be patient with yourself
- Consider using "ha" 1:2 breathing technique
  - Inhale through your nose
  - Exhale through your mouth making soft "haaaa" sound

# BREATHING TECHNIQUES FOR KIDS



HOW DO YOU CULTIVATE A SUPPORTIVE HOME FOR NEURODIVERGENT LEARNERS?



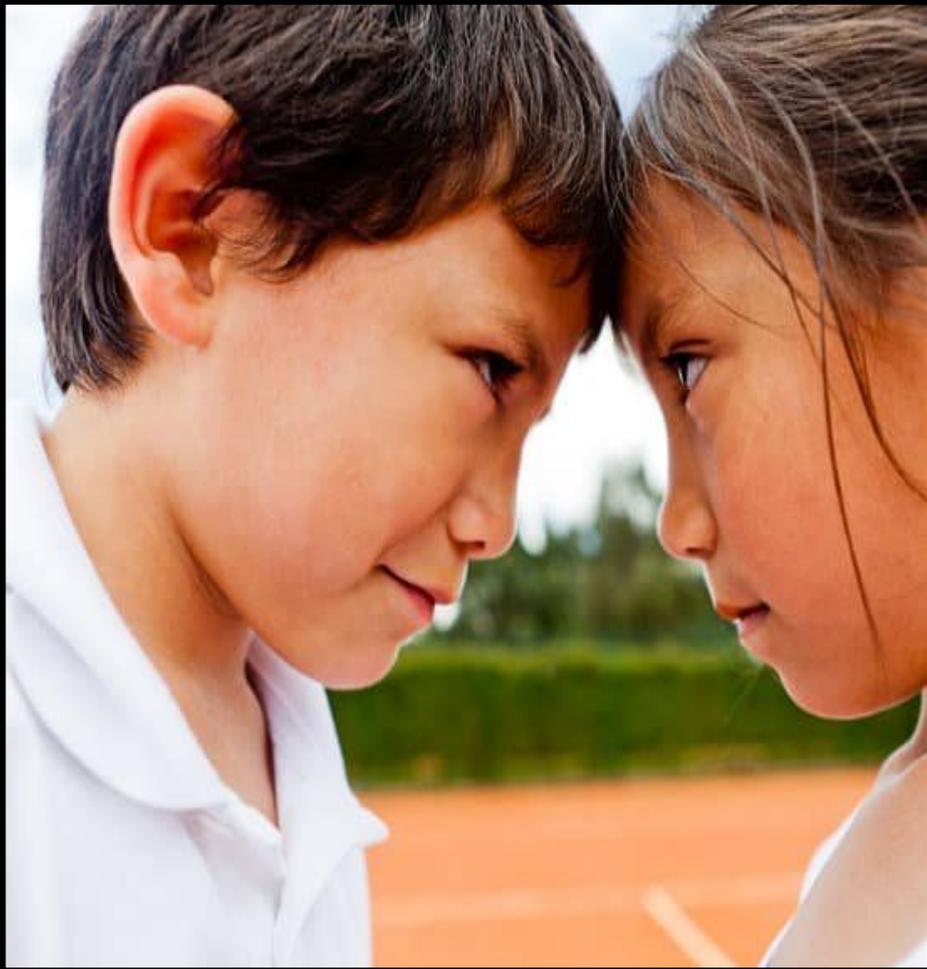
SUPPORT

# APPROACH ADHD/LD AS A FAMILY AFFAIR



TALK OPENLY ABOUT ADHD / LD





# ADHD IMPACT SIBLINGS

- **Disruption**
  - **Physical/ verbal aggression**
  - **Hyperactivity**
  - **Social/ emotional immaturity**
  - **Learning problems**
  - **Family conflicts**
- **Effects of disruption**
  - **Victimization**
  - **Caretaking**
  - **Feeling of sorrow and loss**



# WHAT HELPS SIBLINGS?

## Blog - How to Support Siblings

- Plan one-on-one time with siblings
- Explain ADHD in a kid-friendly way (Cory's Stories)
- Go the extra mile for sibs too
- Remind sibs they're just as important as ADHD child
- Nurture positive sibling relationships

# CREATE A SUPPORTIVE STUDY SETTING



- Near parent
- Sensory needs met
- Organizational systems
- Limit distractions
- Create manageable task list
- Offer rewards
- Comfort is key
- Stay curious

ENCOURAGE AND FACILITATE REGULAR EXERCISE

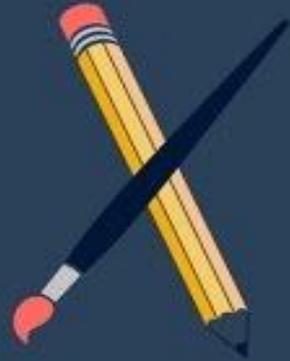


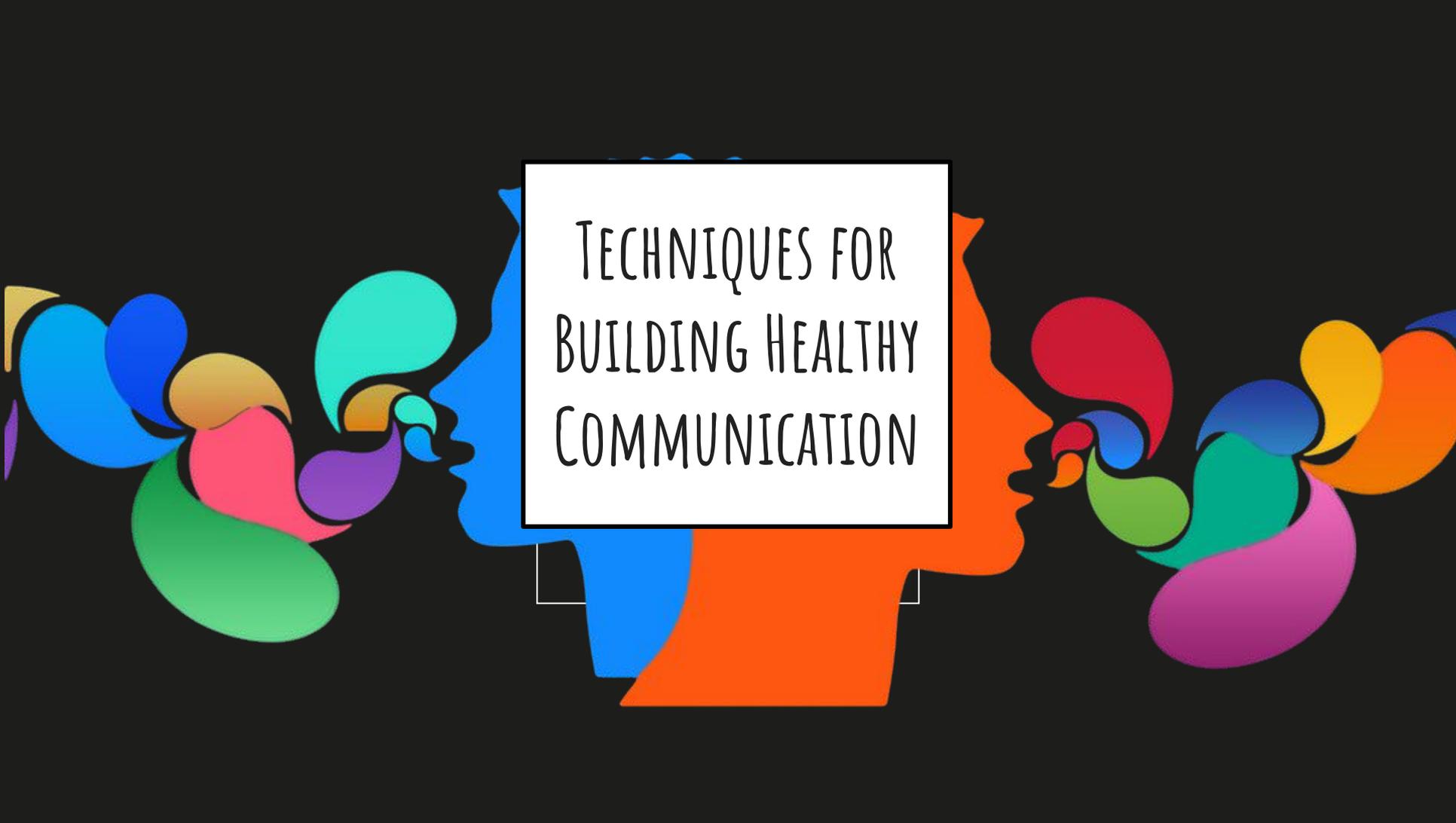


## OFFER HEALTHY FOODS & SUPPLEMENTS

- Fruits & Veggies
- Protein with every meal
- Omega 3 Fatty Acids
- Complex Carbs
- Zinc, Iron, Magnesium
- Avoid buying junk food
- Don't worry about food going bad!

# HOW TO CULTIVATE CREATIVITY IN YOUTH





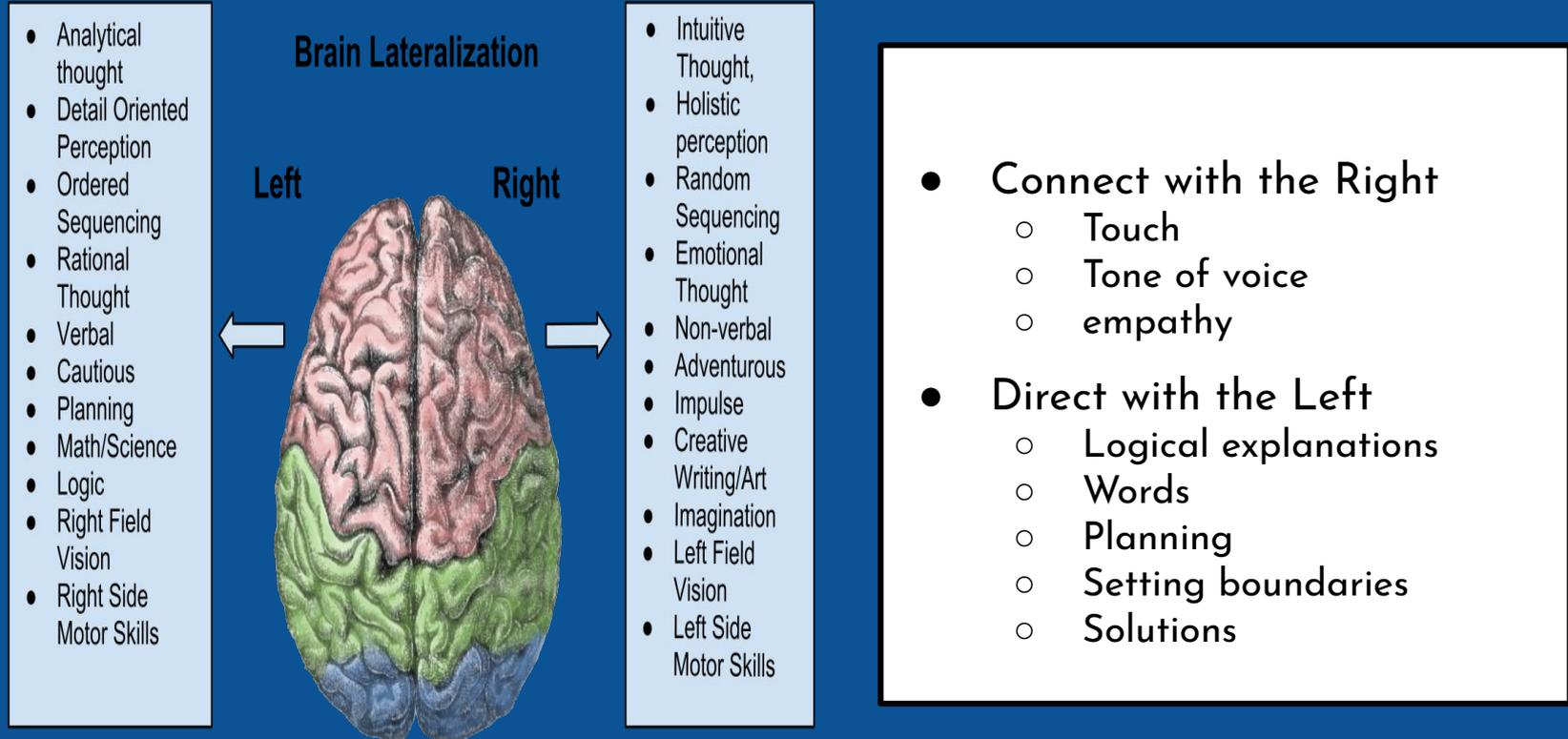
TECHNIQUES FOR  
BUILDING HEALTHY  
COMMUNICATION



## HAVE FAMILY MEETINGS

- What's working, what isn't?
- Solution-focused
- Offer sensory supports (e.g., Aaron's Thinking Putty)
- Keep the diagnosis in mind
- Instead of telling teen to stop, offer other more appropriate options.

# DANIEL SIEGEL'S WHOLE-BRAIN CHILD TECHNIQUES



# WHAT WORKS?

- Remember Magic 5:1 Ratio (Gottman)
- Focus on solutions, not problems
- Don't rehash previous conflicts
- Take a break if you're losing your temper
- Keep biology in mind
- Don't forget to listen
- Keep directions short
- Apologize for your part
- Be a parent, not a friend
- Keep a growth mindset
- Give and take (neither "wins")

# Thank you!

ADHD *and U*

LET'S FIND *Yours* BRILLIANCE

Find out more about me at  
[kqadhdandu.com](http://kqadhdandu.com)

[Resources](#)

