The Brain-Body Connection

Practical Strategies to Support Various Neurotypes and Childhood Trauma

Presented by:
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A Little About Me:

Occupational Therapist, 13 + years

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Currently work primarily with the pediatric population up to young adults, as well as families.

Learning Objectives

01 Understand the brain–body connection

02 Recognize nervous system states

03 Identify patterns across neurotypes

04 Apply practical regulation strategies

The Brain-Body Connection

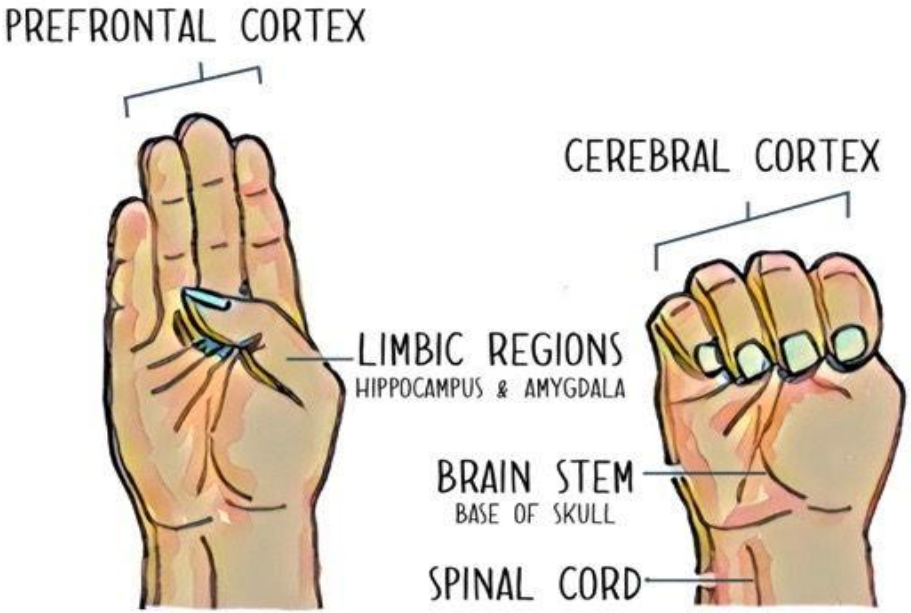
Behavior reflects nervous system state.

Regulation comes before reasoning.

Bottom-up processing influences behavior.

Brain Hierarchy

Dr Dan Siegel's
Hand Model of the Brain



When survival brain activates, thinking brain goes offline.

Cerebral cortex= outer surface of the brain

Prefrontal Cortex= executive functioning, logic

Amygdala= smoke detector that alarms for danger/ possible danger

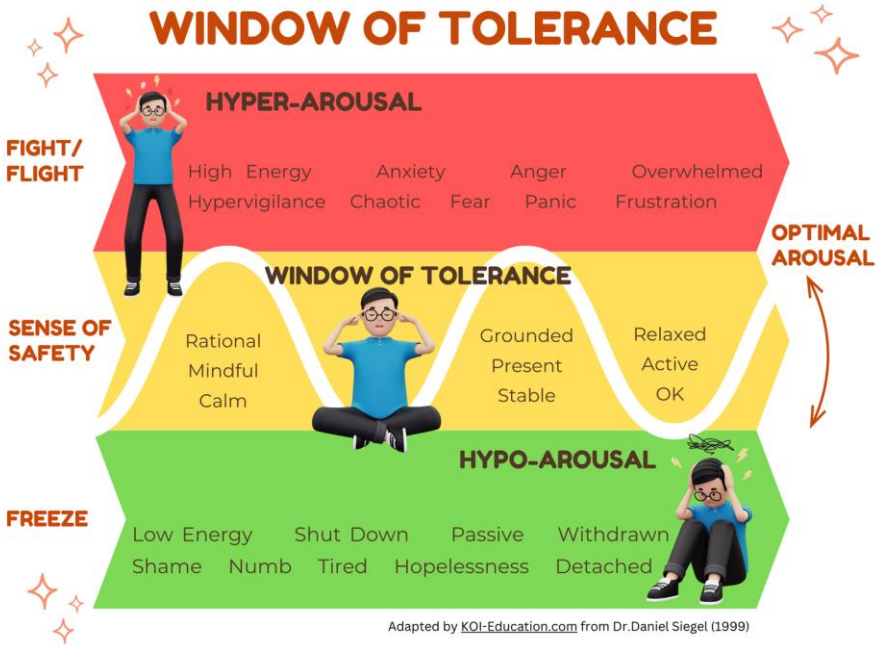
Hippocampus= memory/ working memory

The Nervous System

Learning and relationship happens best in a regulated state.

States:

- Hyper-aroused
  - -impulsive, reactive, fight/flight
- Regulated
  - -engaged, flexible
- Hypo-aroused
  - - shut down, withdrawn, low energy



Neurodiversity Lens

Brains regulate differently

- Sensory Systems
- Executive Functioning
- Stress-response differences

Overview of Neurotypes

Autism Spectrum Disorder

ADHD

Fetal Alcohol Syndrome

Trauma-impacted youth

Autism

Autism Facts

According to the CDC, 1 in 31 children in the United States has autism

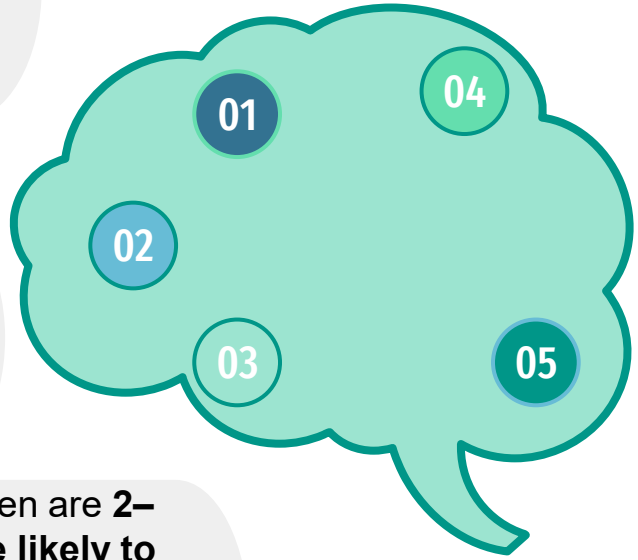
(*Data and Statistics on Autism Spectrum Disorder*, 2025)

Research shows, 69–95% of autistic individuals experience sensory processing differences.

(Green et al., 2016)

Autistic children are **2–3 times more likely to experience trauma or adverse childhood experiences (ACEs)**.

(Hoover & Kaufman, 2017)



Children with autism who have higher sensory sensitivity show **significantly more anxiety, emotional dysregulation, and behavioral outbursts.**

(Green et al., 2016)

Autistic nervous systems often start closer to fight-flight activation.
Studies show differences in:

- heart rate variability
- cortisol regulation
- autonomic nervous system responses

(Porges, 2006)

Autism- Brain Structures

Experts now believe that the brains of those with Autism have pruning differences. When the brain prunes, it leaves too many neuro pathways.

They also believe that the inner ear develops differently and has a harder time shutting off background noises which impacts their nervous system.

What we see...

- Intense detail
- Pattern recognition
- Memory for details
- Systemizing

What we see...

- Challenges with multiple types of information
- Challenges with socializing

What is happening in the brain?

Hyper-connectivity in some areas of the brain especially sensory and perceptual regions

What's happening in the brain?

Hypo-connectivity in long range networks

Autism- Brain/ Body Themes

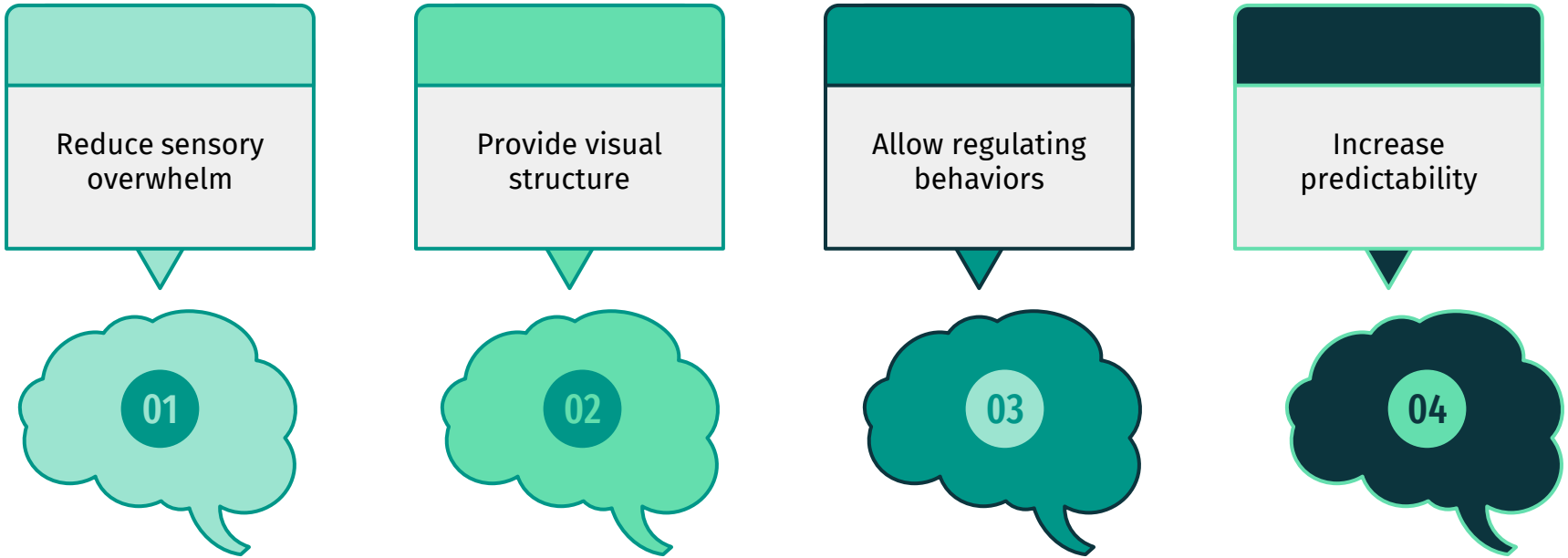
Sensory processing differences

Interoception differences

Need for predictability

Social energy cost

Autism Support Strategies



ADHD

ADHD Facts

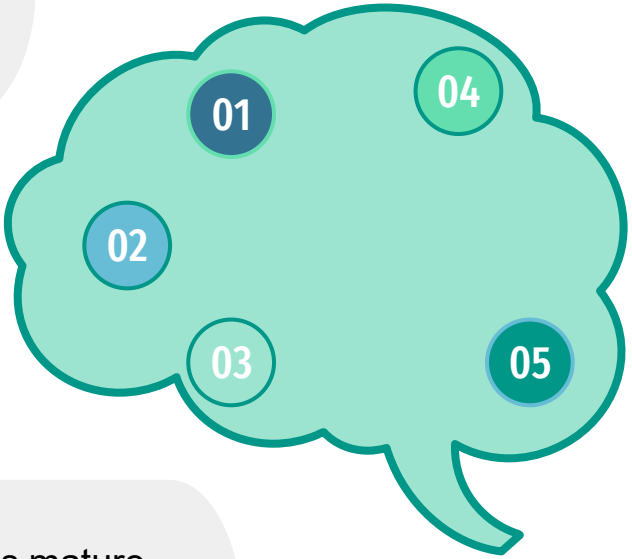
About 9–11% of children in the U.S. have ADHD.

(Danielson, M. L., et al. 2022)

“Children with ADHD often show physiological differences in how their nervous systems regulate attention and stress.”
(Rash, J. A., et al. 2018)

ADHD brains mature about 3 years later in key executive areas.

(Shaw, P., et al. 2007)



“Sensory processing differences are extremely common in ADHD and can significantly impact behavior and attention.” (Ghanizadeh, A. 2011)

Research suggests **up to 90% of individuals with ADHD show executive function deficits**. Executive functions affected include:

- working memory
- inhibition
- planning
- cognitive flexibility

(Barkley, R. A. 2015)

ADHD- Brain Structures

The brain with ADHD has low dopamine or their dopamine receptors are not efficient in using the dopamine they have.

Research consistently shows reduced activation and delayed maturation in the Prefrontal Cortex in individuals with ADHD (it is less consistent and requires more effort. .

What we see...

- Challenges with:
  - Working memory
  - planning / organization
  - Impulse control
  - Emotional regulation
  - Shifting between tasks

What is happening in the brain?

The brain is less synchronized to deeper brain regions.

What we see...

- Challenges with:
  - Motivation
  - Task initiation
  - Boredom tolerance
- Results in seeking novelty/ challenges

What's happening in the brain?

Nucleus Accumbens which is the brain's reward system shows reduced reward anticipation activation.

ADHD- Brain/ Body Themes

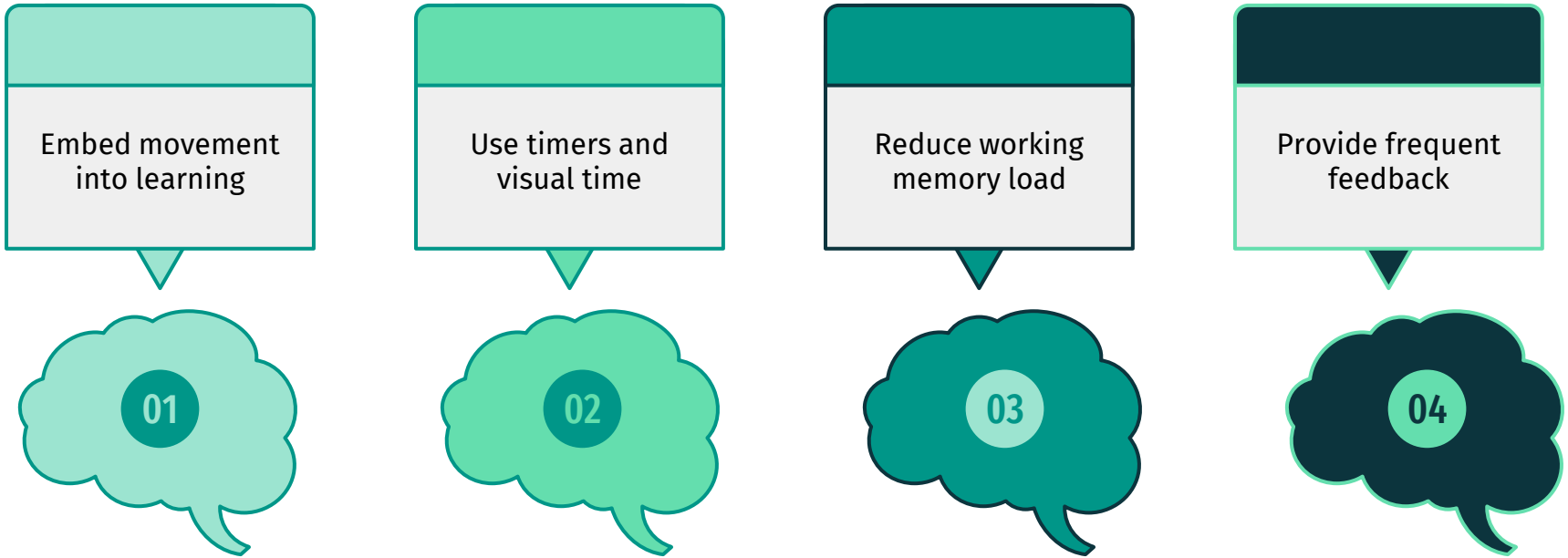
Movement supports regulation

Dopamine-driven motivation

Executive function challenges

Time perception differences

ADHD Support Strategies



Fetal Alcohol Syndrome

Fetal Alcohol Syndrome Facts

Research suggests 1–5% of children in the United States may have an FASD.

(May, P. A., et al. 2018)

Sensory processing differences are common in children with FASD and can significantly affect behavior and regulation.

(Franklin, L., et al. 2008)

Research suggests **over 90% of individuals with FASD experience mental health difficulties during their lifetime.**

(Streissguth, A. P., et al. 2004)

Children with FASD frequently demonstrate challenges with:

- working memory
- impulse control
- planning
- flexible thinking.

(Mattson, S. N., et al. 2011)

Alcohol exposure during pregnancy can alter:

- brain structure
- neuronal migration
- synapse formation
- white matter connectivity.

(Mattson, S. N., et al. 2019)

Fetal Alcohol Syndrome- Brain Structures

Prenatal alcohol exposure can change how brain cells grow, organize, and connect during development.

What we see...

- Challenges with:
  - Impulse control
  - emotional regulation
  - Planning

What is happening in the brain?

Disrupted development in the prefrontal cortex

What we see...

- Challenges with:
  - Poor coordination
  - Body awareness
  - Motor planning

What we see...

- Challenges with:
  - Memory
  - learning

What's happening in the brain?

Prenatal alcohol exposure can reduce hippocampal volume.

What is happening in the brain?

Alcohol exposure during pregnancy frequently affects the cerebellum, leading to motor coordination challenges and difficulty with sequencing movements.

Fetal Alcohol Syndrome- Brain/ Body Themes

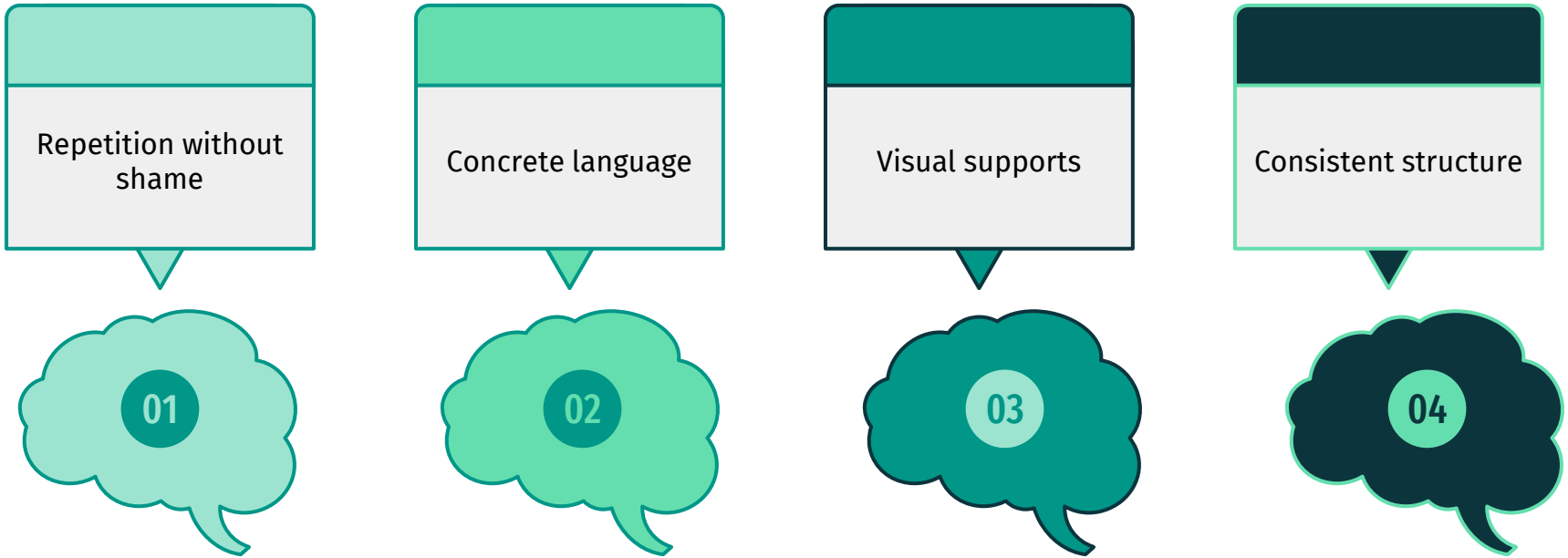
Processing differences

Difficulty with cause and effect

Inconsistent performance

Fatigue and overwhelm

Fetal Alcohol Syndrome Support Strategies



Trauma

Trauma Facts

According to the CDC, About 1 in 5 students (≈20%) report experiencing four or more traumatic experiences, which is considered a high ACE score.

(*About Adverse Childhood Experiences*, 2026)

Chronic stress in childhood can alter development in several brain areas:

- prefrontal cortex
- hippocampus
- amygdala.

(Teicher, M. H., & Samson, J. A. 2016)

Protective relationships and positive experiences can buffer the effects of trauma.

(Rothman, E., & Lynch, A. 2023)

Chronic trauma exposure can dysregulate the **hypothalamic-pituitary-adrenal (HPA) axis**, the body's primary stress response system.

(McEwen, B. S. 2017)

Recent neuroimaging research shows childhood maltreatment is associated with **changes in brain structure and connectivity**. Findings include changes in:

- white matter networks brain connectivity patterns
- emotional processing systems.

(Chung, M. K., et al. 2023)

Trauma- Brain Structures

What we see...

- Hypervigilance / always on alert
- Strong emotional reactions
- Difficulty calming after stress

What is happening in the brain?

Increased activity in the amygdala and threat detection system, with reduced regulatory input from the prefrontal cortex, causing the brain to prioritize survival and danger detection.

What we see...

- Difficulty focusing
- Distractibility in class
- Trouble with task persistence

What's happening in the brain?

Changes in the prefrontal cortex and stress hormone systems can disrupt executive functioning, making attention, planning, and sustained mental effort harder.

What we see...

- Difficulty remembering instructions
- Learning inconsistencies
- Trouble connecting cause and effect

What is happening in the brain?

Chronic stress can affect the hippocampus, a brain structure involved in memory and learning, making it harder to store and retrieve information.

Trauma- Brain/ Body Themes

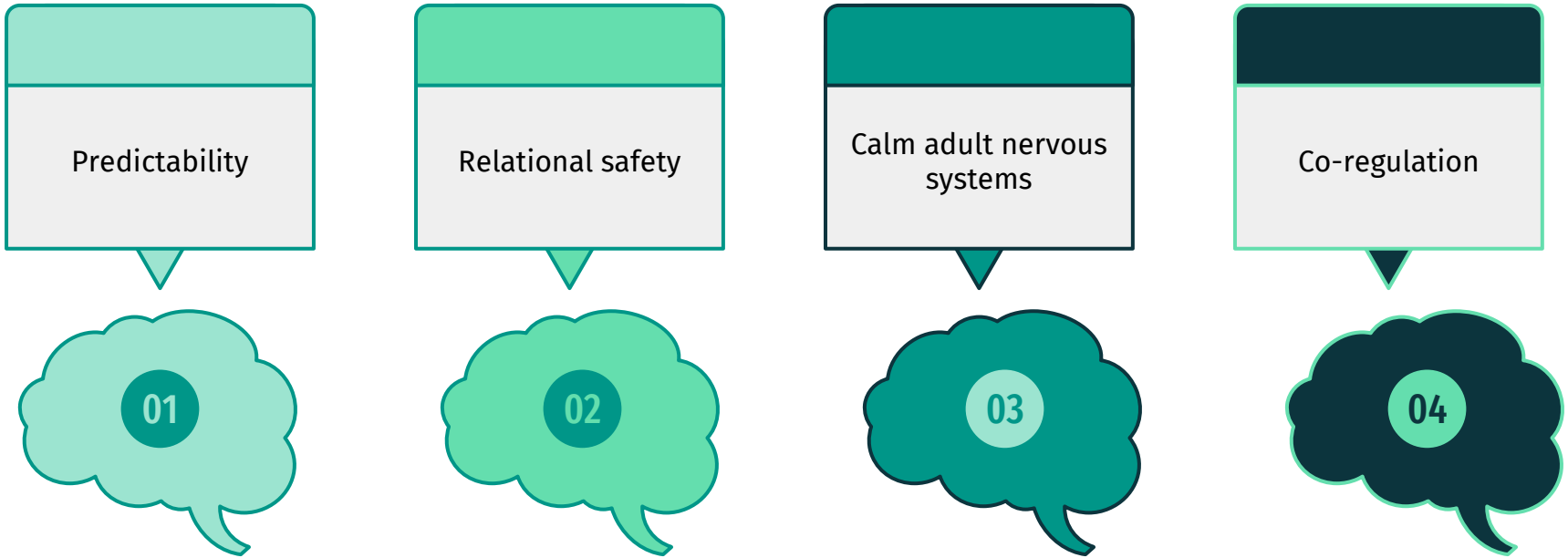
Survival brain activation

Hypervigilance

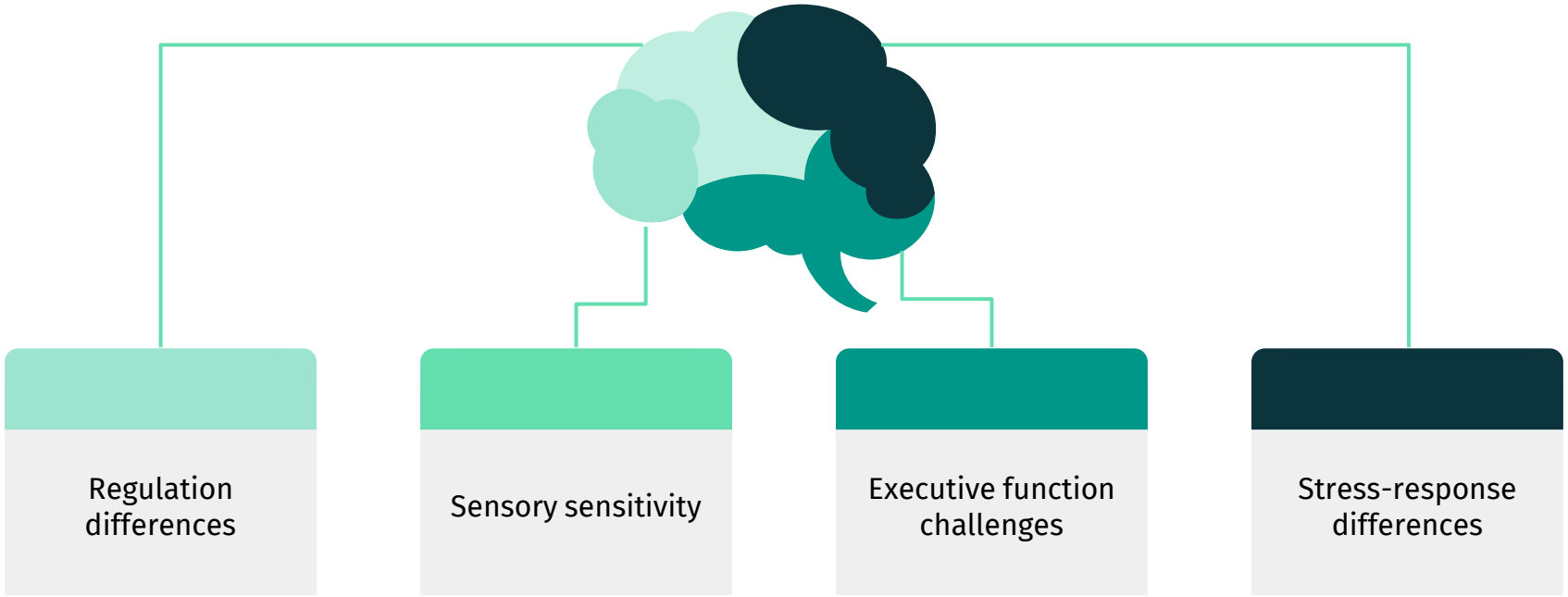
Safety scanning

State-dependent behavior

Trauma Support Strategies



Overlapping Patterns Across Neurotypes



Regulation First

Connection → Regulation → Learning

Practical Strategy Framework

01 Regulate

03 Reduce Demand

02 Relate

04 Reframe

Regulate

Movement breaks

Heavy work

Sensory tools

Breathing

Rhythm

Reduce Demand

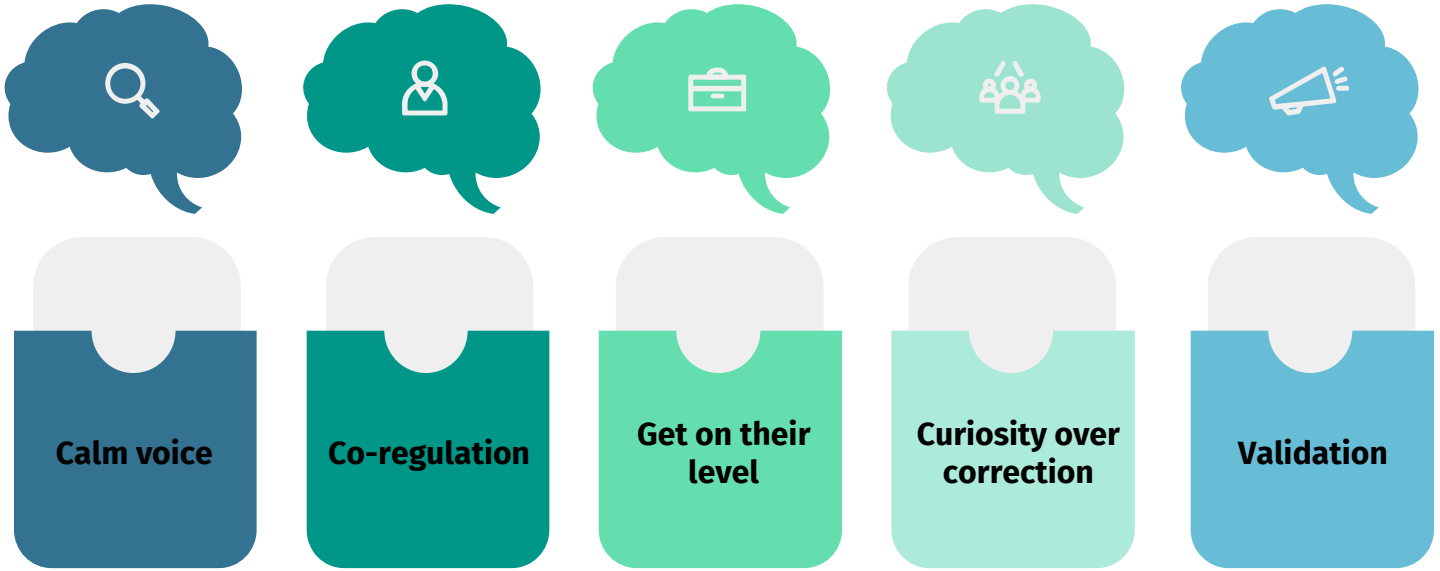
Simplify language

Reduce choices

Scaffold transitions

Adjust expectations temporarily

Relate


Calm voice
Co-regulation
Get on their level
Curiosity over correction
Validation

Reframe

Instead of asking:

'Why won't they behave?'

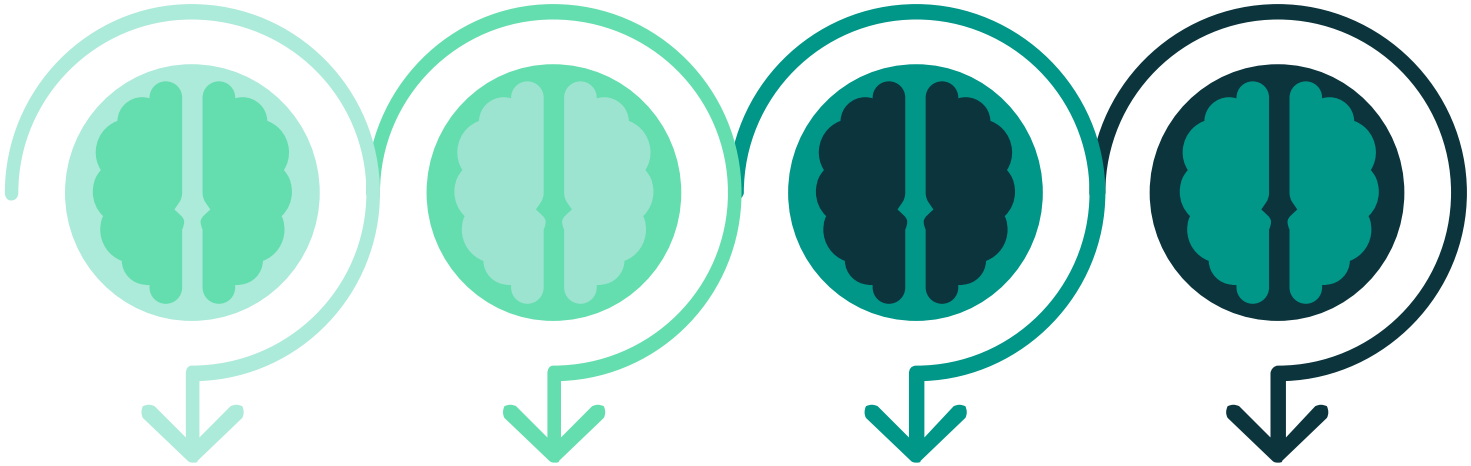
Ask:

'What does their nervous system need?'

Behavior Reframe

Instead of:	Consider:
Defiant	Dysregulated
Lazy	Overwhelmed
Attention-seeking	Connection-seeking

Common Pitfalls



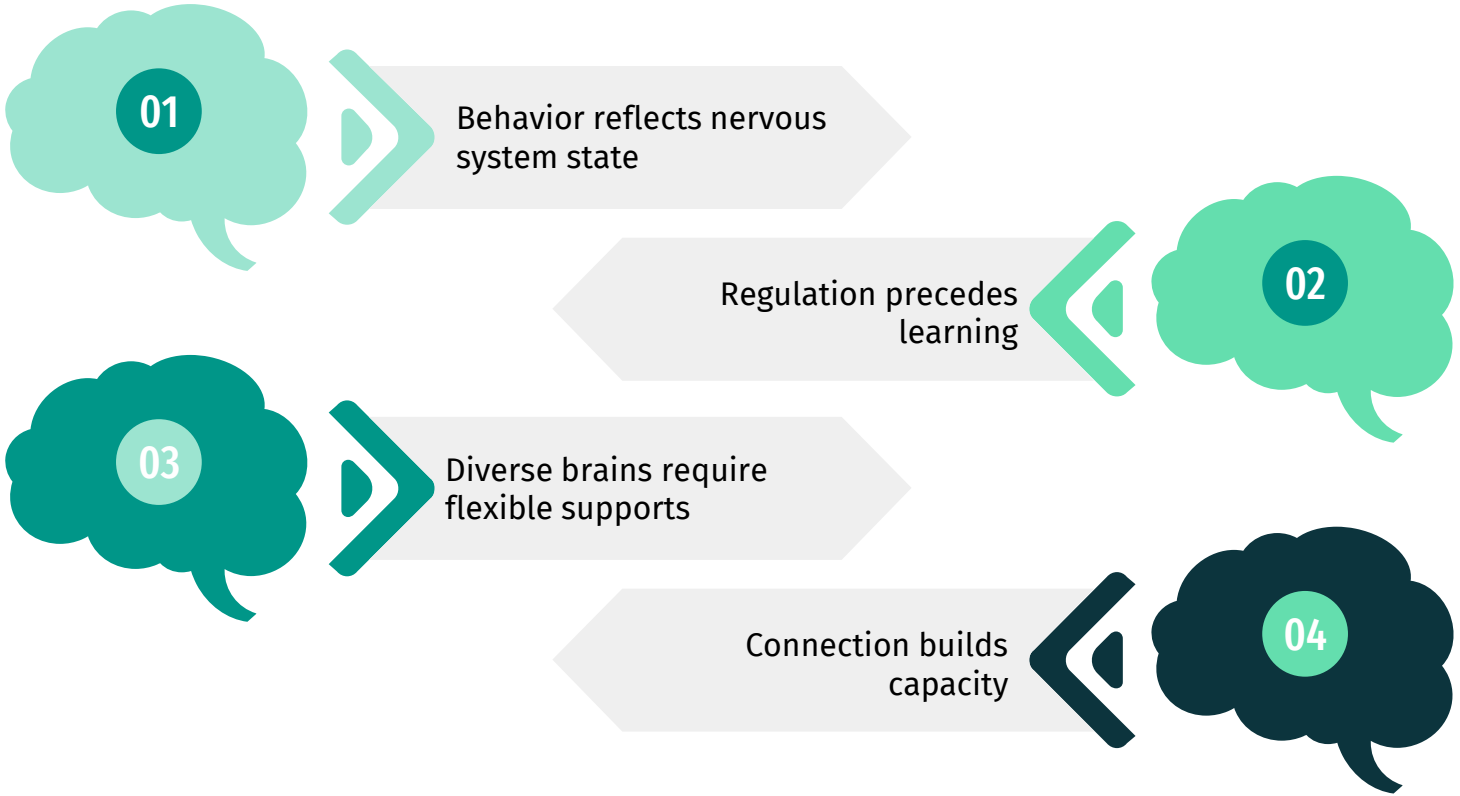
Talking too much during dysregulation

Using consequences in survival states

Removing regulating behaviors

Expecting skills during overwhelm

Key Takeaways



Questions?

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