The Twice-Exceptional (2E) Individual and Executive Functioning (EF)
LDA of America
February 16-18, 2026
Jim Russell, Ph.D., L.L.C.

Learning Objective One

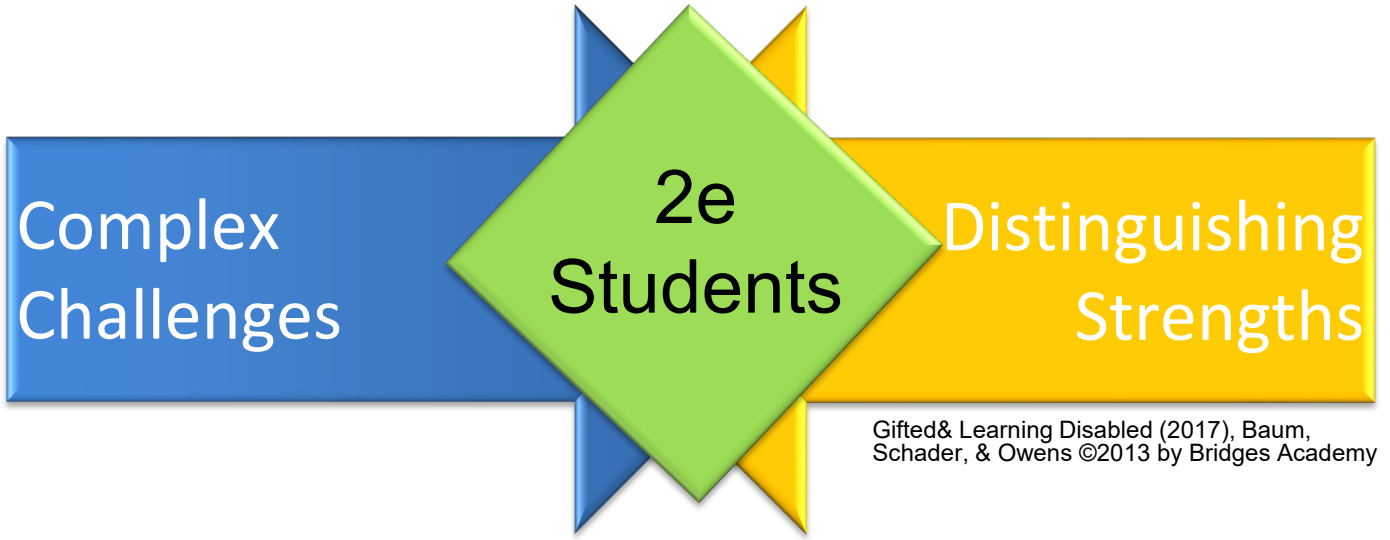
To describe the interplay between emotions and executive function

(Hot vs Cold pathways) for 2E students

What is Twice Exceptional ? (2E)

2E Challenges

- **Distinguishing Strengths**
- **Complex Challenges**



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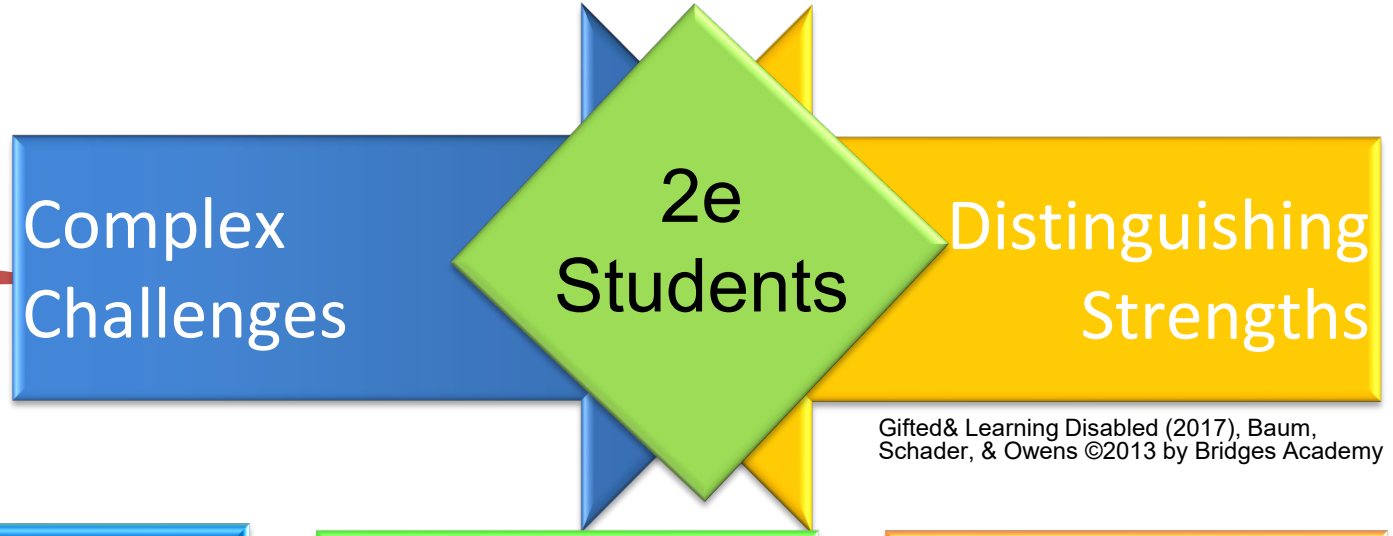
2E Challenges



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Complex Challenges

- Executive function deficits
- Emotional regulation
- inconsistent performance
- Sensory issues

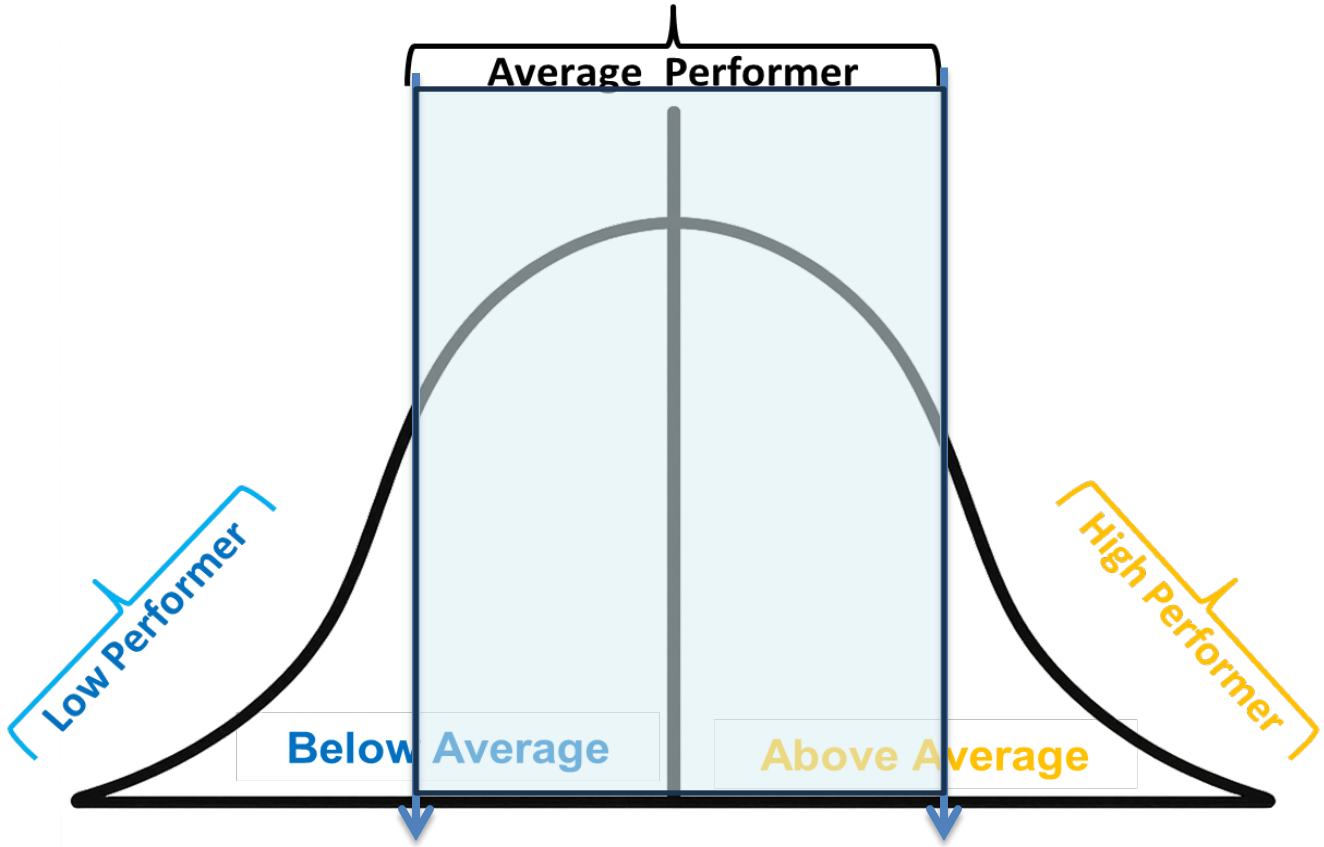
2e Students

- Gifted
- Disability

Distinguishing Strengths

- Advanced vocabulary
- creativity
- deep curiosity
- moral reasoning
- intense focus
- Perfectionism

2E students operate at both ends



Starting place

No two (2E) human beings are like

N=1

A unique person

Basic Neurobiology of the Brain

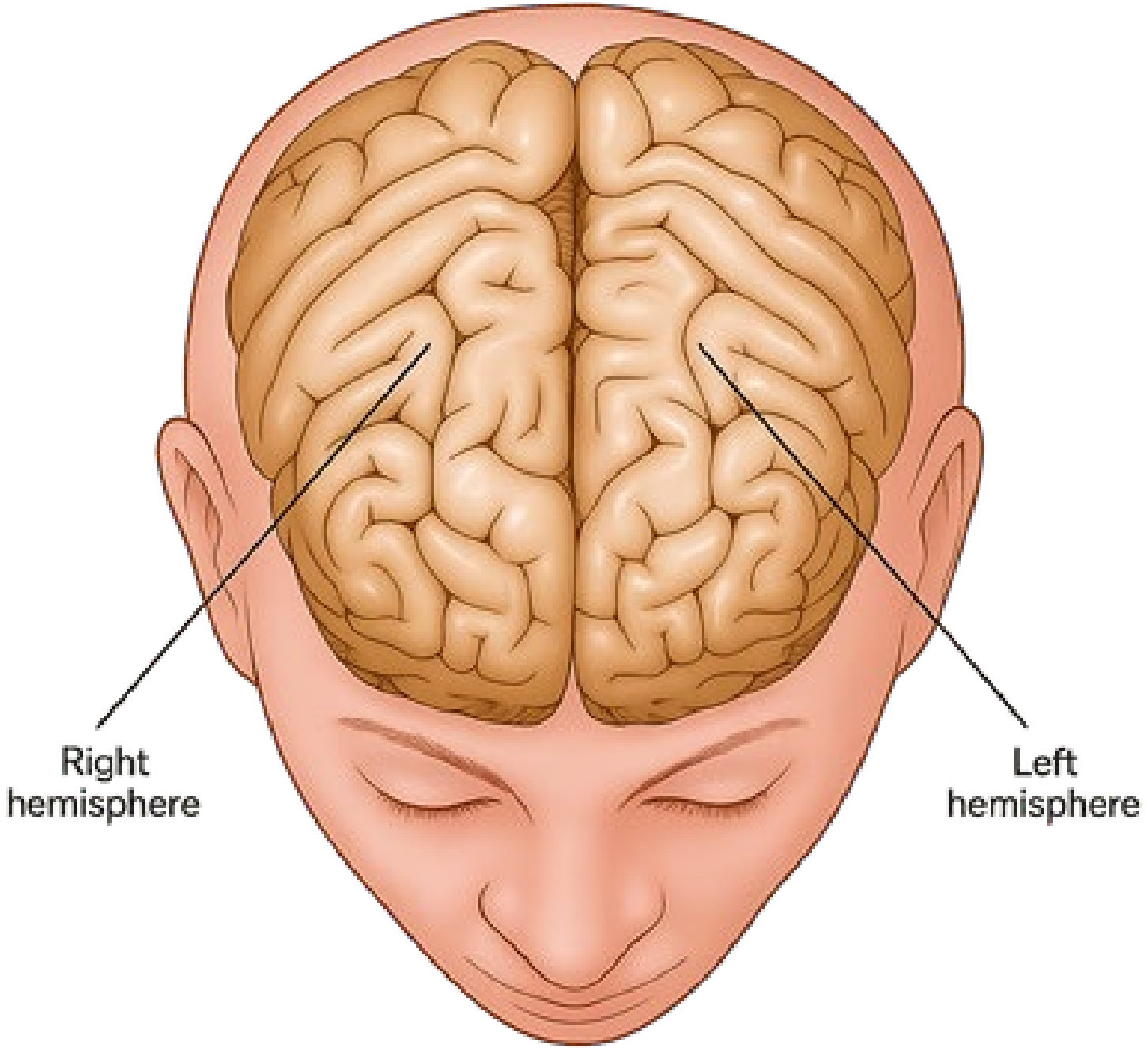
Brain Basics

About 3.5 pounds of gelatinous material

1. Brain 2% body weight.
2. Consumes 20% Total Energy & Oxygen.
3. Water = 73%
4. Neurons: **86 Billion**
5. Synapses: **100 Trillion**
6. Blood Flow: 15% Total Cardiac output, 750mL/min
7. Meninges-protective membranes covering the brain.

Brain Basics

Right Hemisphere
Left Hemisphere



Human Information Processing

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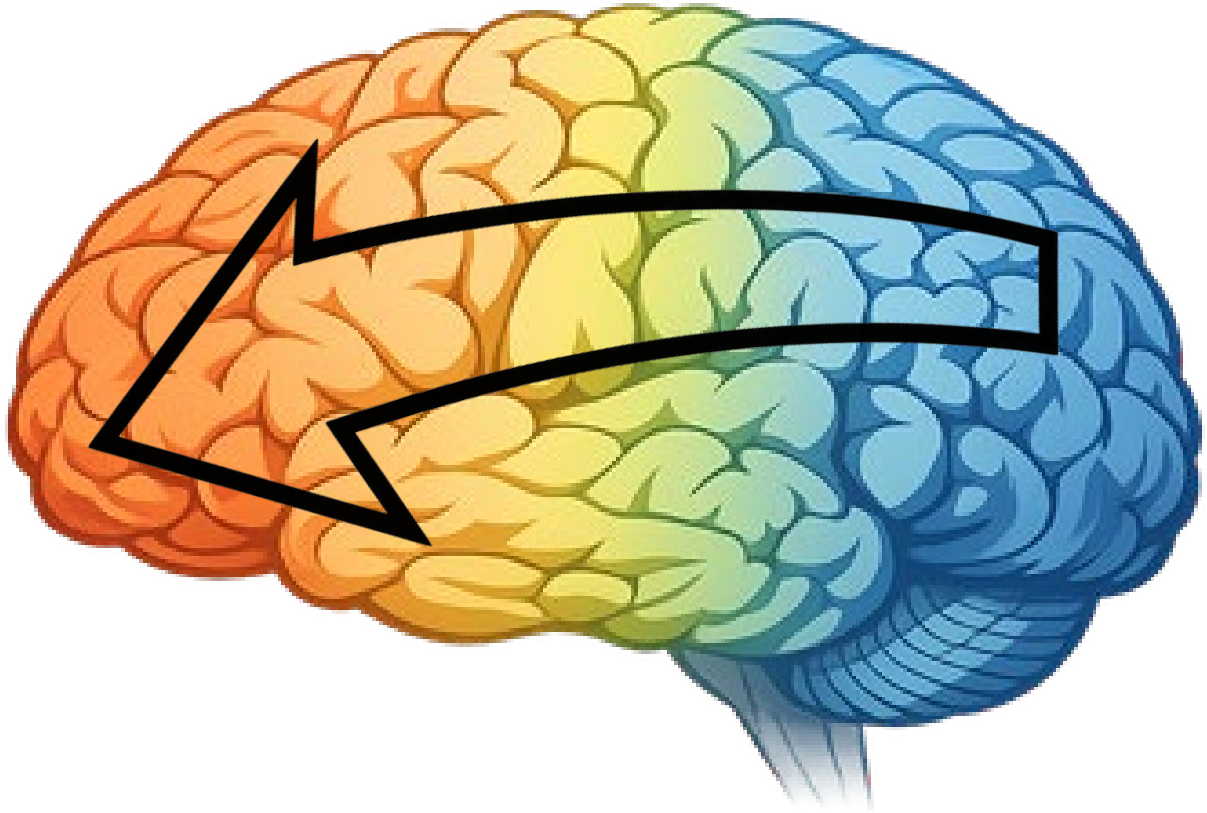
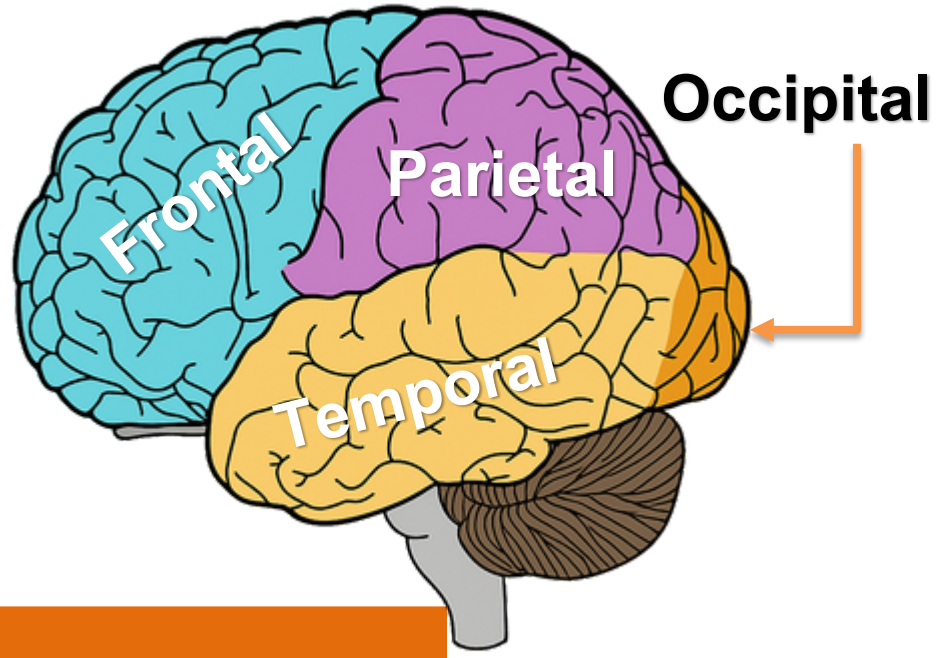
Back to front



Posterior to Anterior Cortical Flow

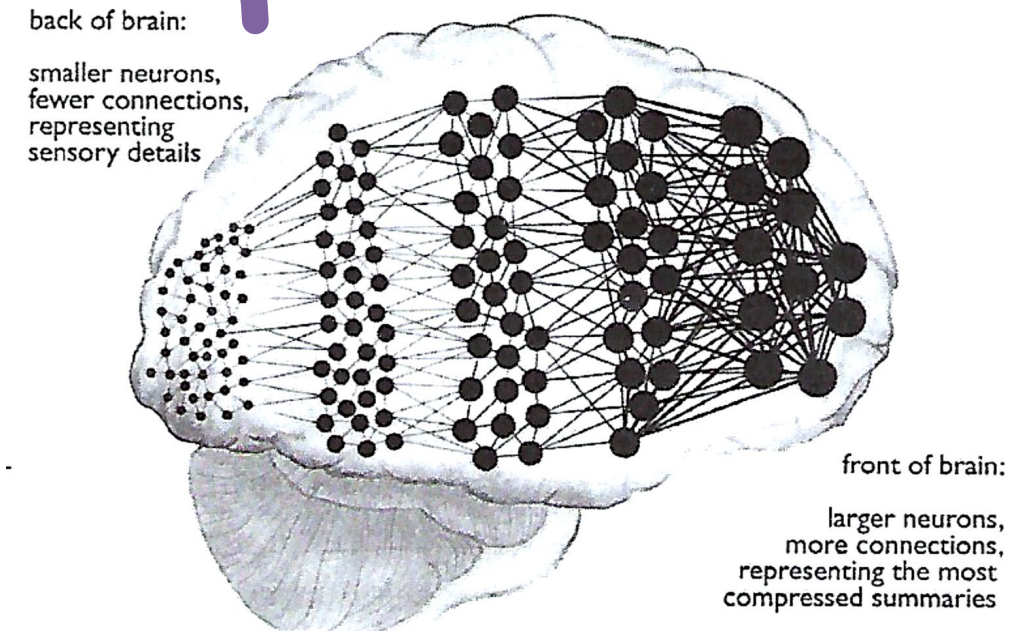


- OCCIPITAL LOBE: VISUAL PROCESSING
- PARIETAL LOBE: SPATIAL INTEGRATION
- TEMPORAL LOBE: AUDITORY & MEMORY
- FRONTAL LOBE: PLANNING & DECISION-MAKING

Compression in the brain

Seven and a Half Lessons About the Brain…

Compression in the brain makes abstract thinking possible



(this diagram is conceptual, not anatomically precise)

Neurotransmitters are chemical messengers

Chemical Messengers

Dopamine	Epinephrine	Norepinephrine	Serotonin	Acetylcholine
• Crucial for • motivation • **reward**-based learning	• Helps • **Regulate** the sympathetic nervous system • Prepares the body for **action!**	• Manages • **arousal,** • **alertness,** • **attention**. ***Strategies for EF improvement often leverage these Pathways; Exercise.***	• Regulates **mood stabilization** • other processes	• Involved in • **attention** • **Memory** encoding • Essential for **Cognitive function and Learning.**

Classes of Neurotransmitters Monoamines

Catecholamine

- Epinephrine
- Norepinephrine
- Dopamine

Indoleamines

- Serotonin
- Melatonin

Learning & Memory, By Ms. Marilee Sprenger ISBN 0-87120-350-2..

Neurotransmitters

- Amino Acids
- Glutamate > **Excitatory**
- GABA>**Inhibitory**

GABA **G**amma-**A**mino**B**utyric **A**cid

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Neurotransmitters

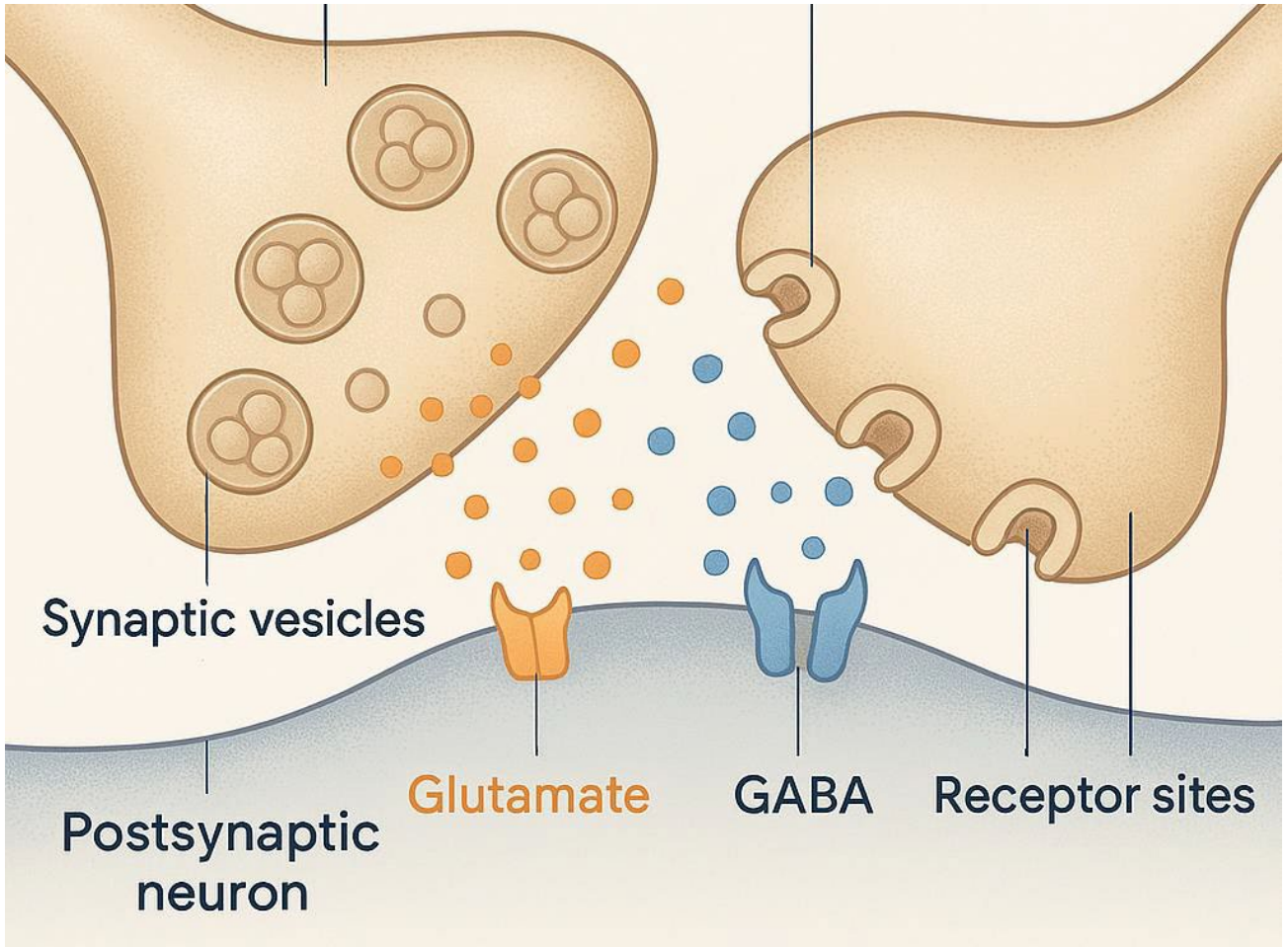
GABA

Gamma

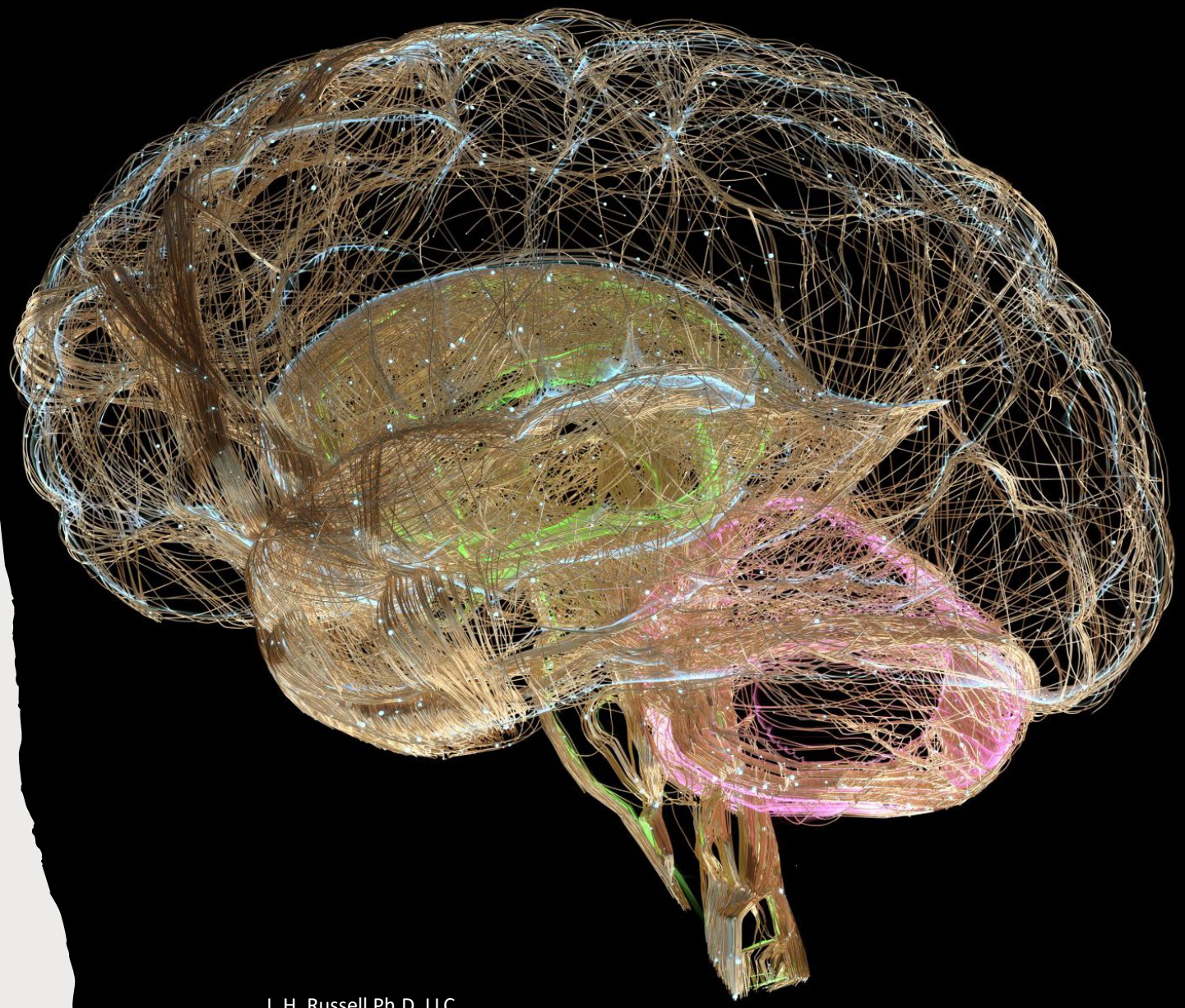
Amino

Butyric

Acid



Counseling re-wires the brain



Prefrontal Cortex (PFC)

Prefrontal Cortex (PFC) is the “CEO.”

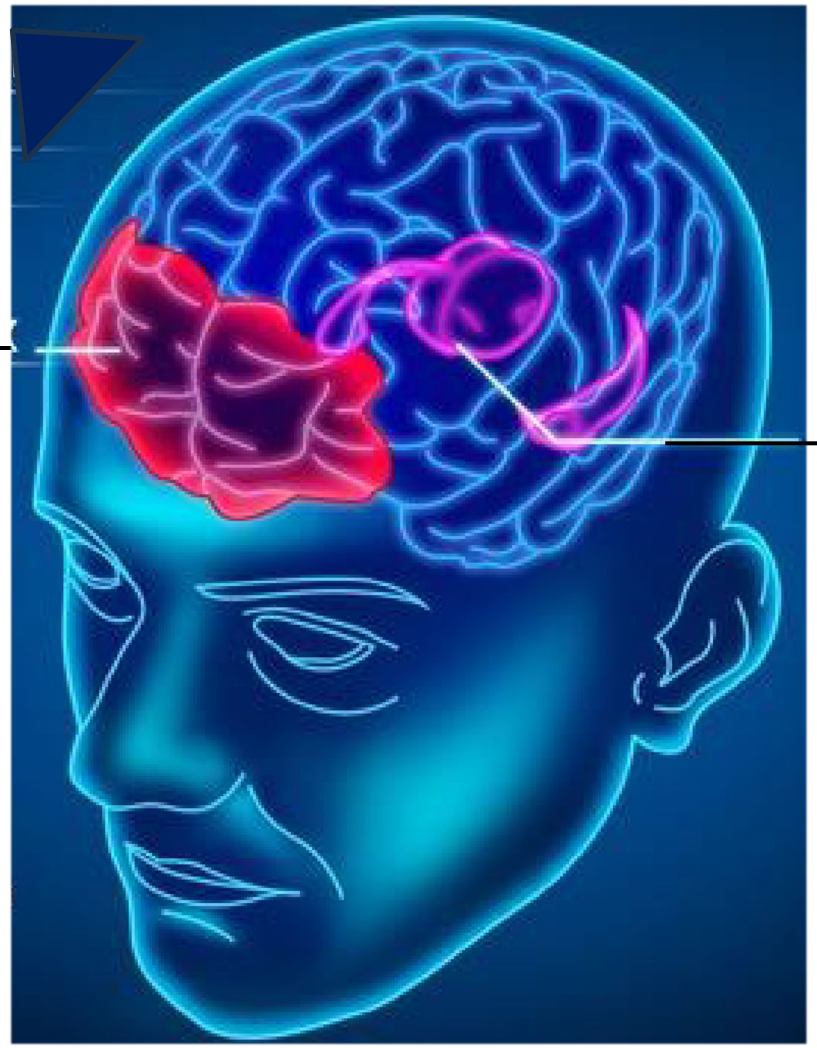
The “CEO” for high-level decision-making and planning, directly impacted by stress and requiring regulation from other systems.

Thinking about Thinking- Higher Reasoning- Executive Functions

Prefrontal Cortex

Functions

1. Empathy
2. Insight
3. Response Flexibility
4. Emotion Regulation
5. Body Regulation
6. Morality
7. Intuition
8. Attuned Communication
9. Fear Modulation



Limbic Brain

1. Fight, flight, freeze stress response
2. Thinks, “Am I safe? Do People want me?”
1. Emotions live here

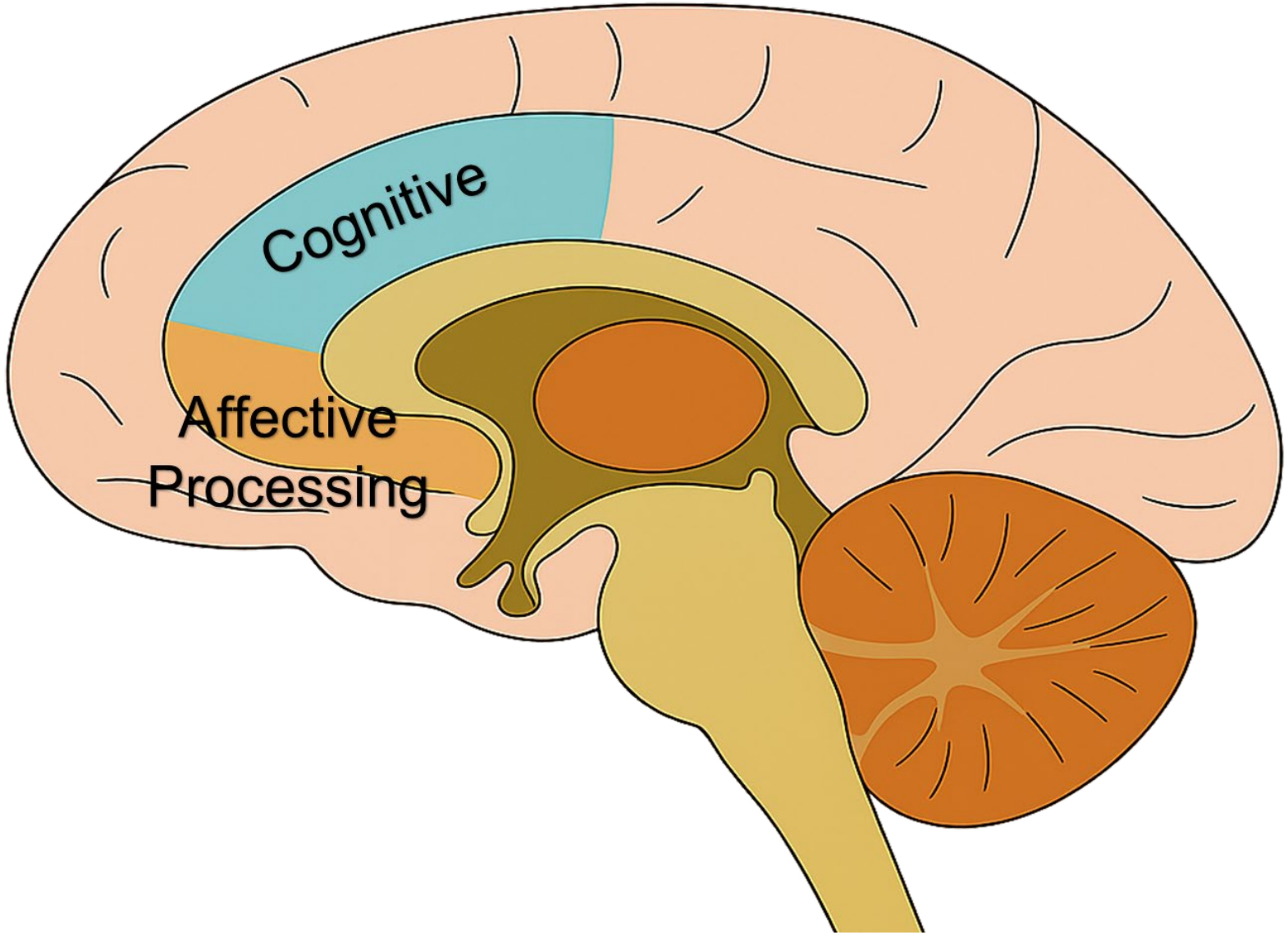
Anterior Cingulate Cortex (ACC)

Anterior Cingulate Cortex (ACC)

Functions as the brain's **error-detection** and **emotional regulation center**, working to resolve conflicts between goal-directed behavior and emotional impulses.

Anterior Cingulate Cortex (ACC)

Dorsal ACC (UPPER)	Ventral ACC (LOWER)
• **Cognitive control** • Attention allocation • Conflict monitoring, • Decision-making	▪ Emotion regulation ▪ Reward anticipation ▪ Affective salience ▪ Empathy ▪ Motivation



Working Memory

Paraphrasing Dr. Russell Barkley:

Working Memory is a system that allows a person "…to retain and process information for the purpose of guiding behavior."

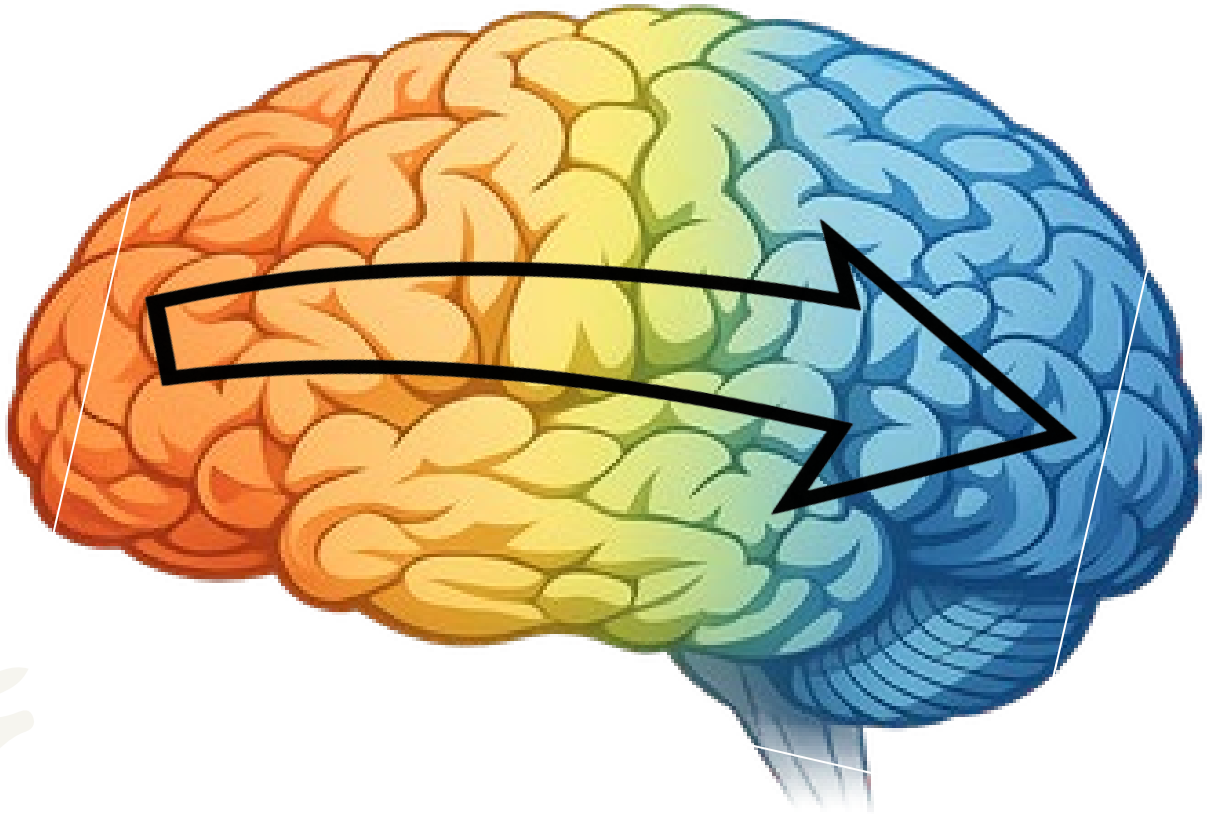
Dr. Jim's definition:

Working memory is like the Ram on a computer.

It temporarily holds a limited amount of information before it is processed into the Central Executive.

What is Working Memory?

Front to Back



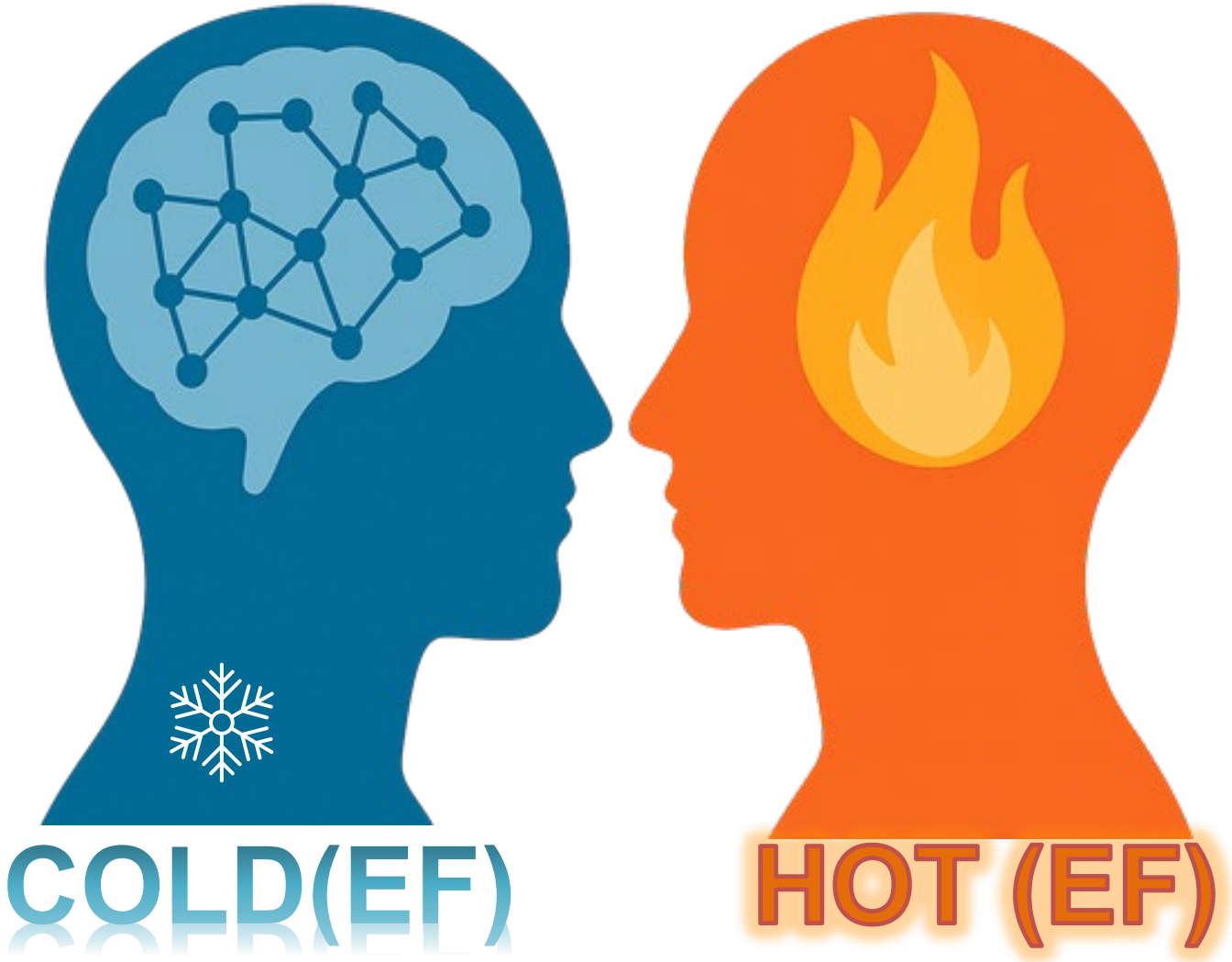
Working Memory

Focuses attention

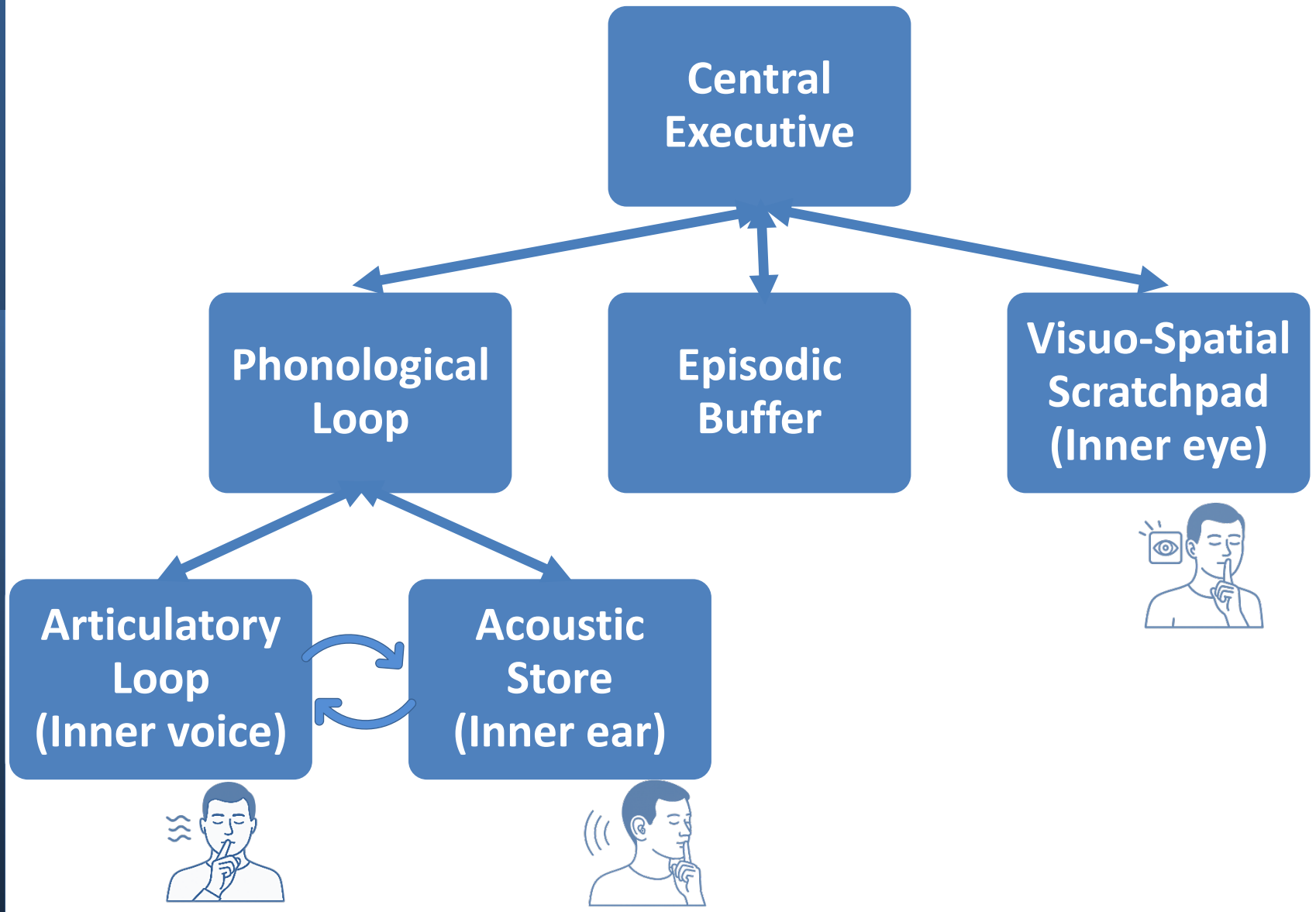
Temporary storage

Operates over a few seconds

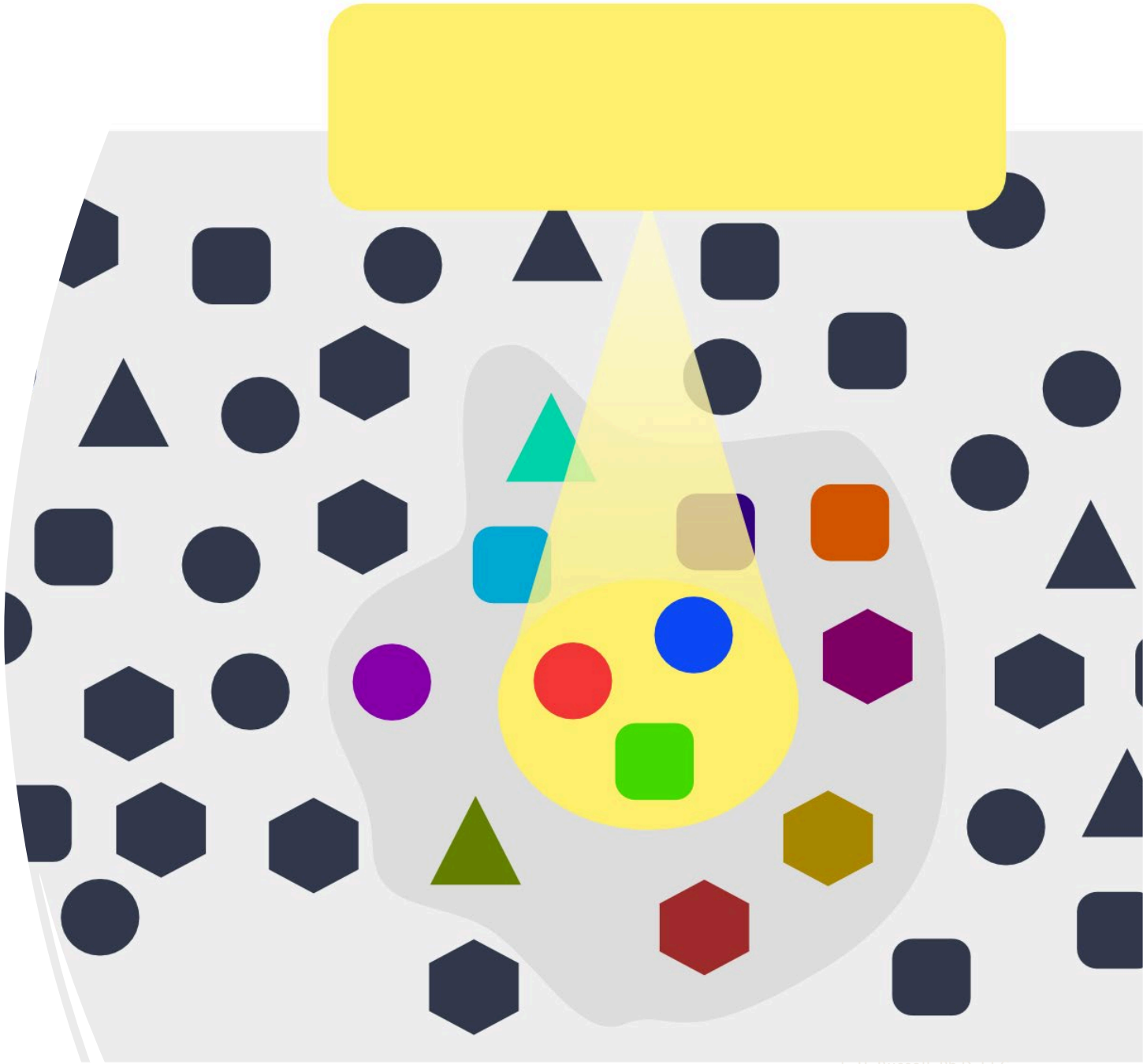
Manipulates information



Baddeley and Hitch's model **Working Memory Model**



The central executive of working memory is retrieving memory from long-term memory.



Prospective Memory

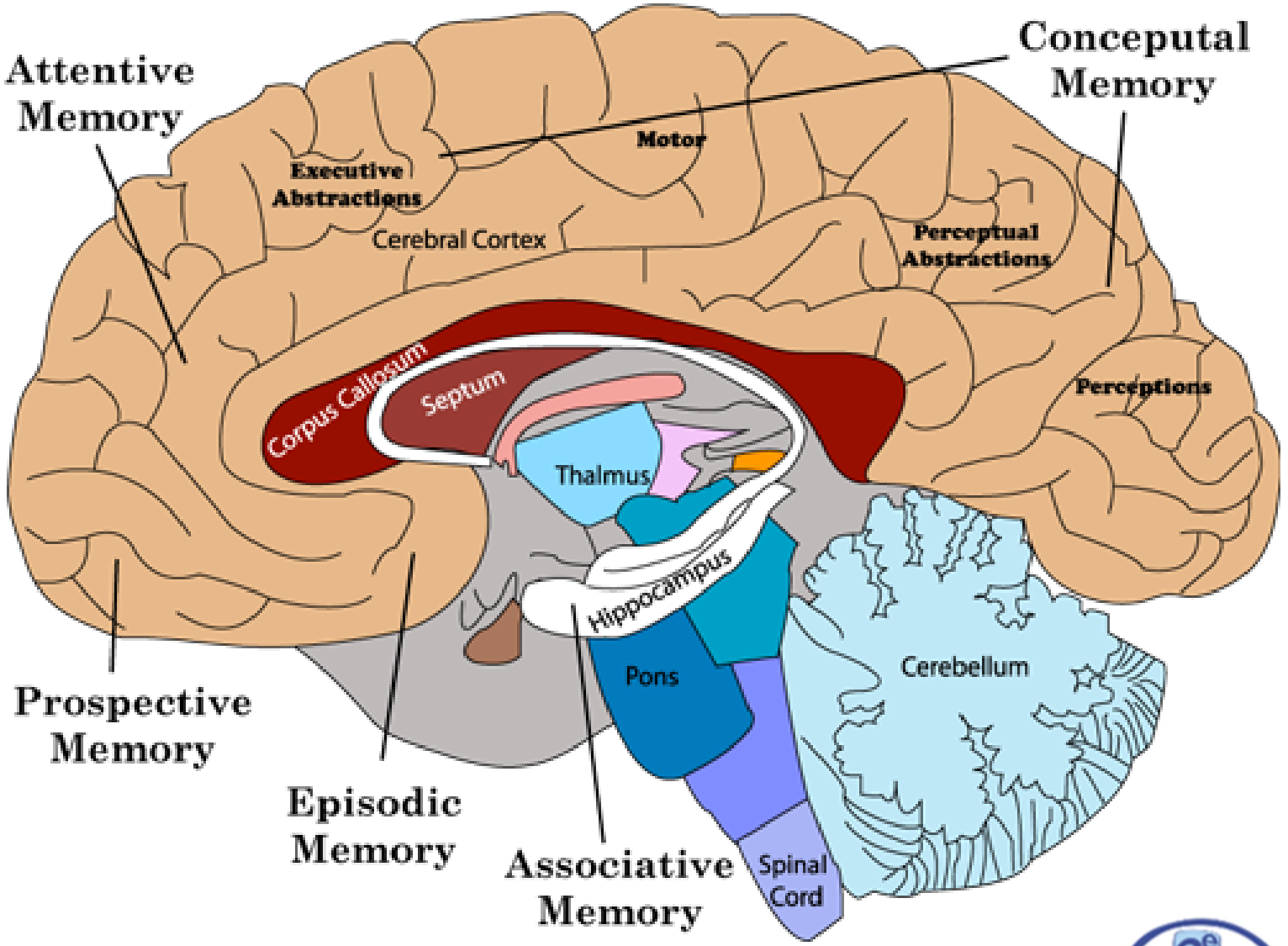
Remembering

…

how to perform a planned action in the future,

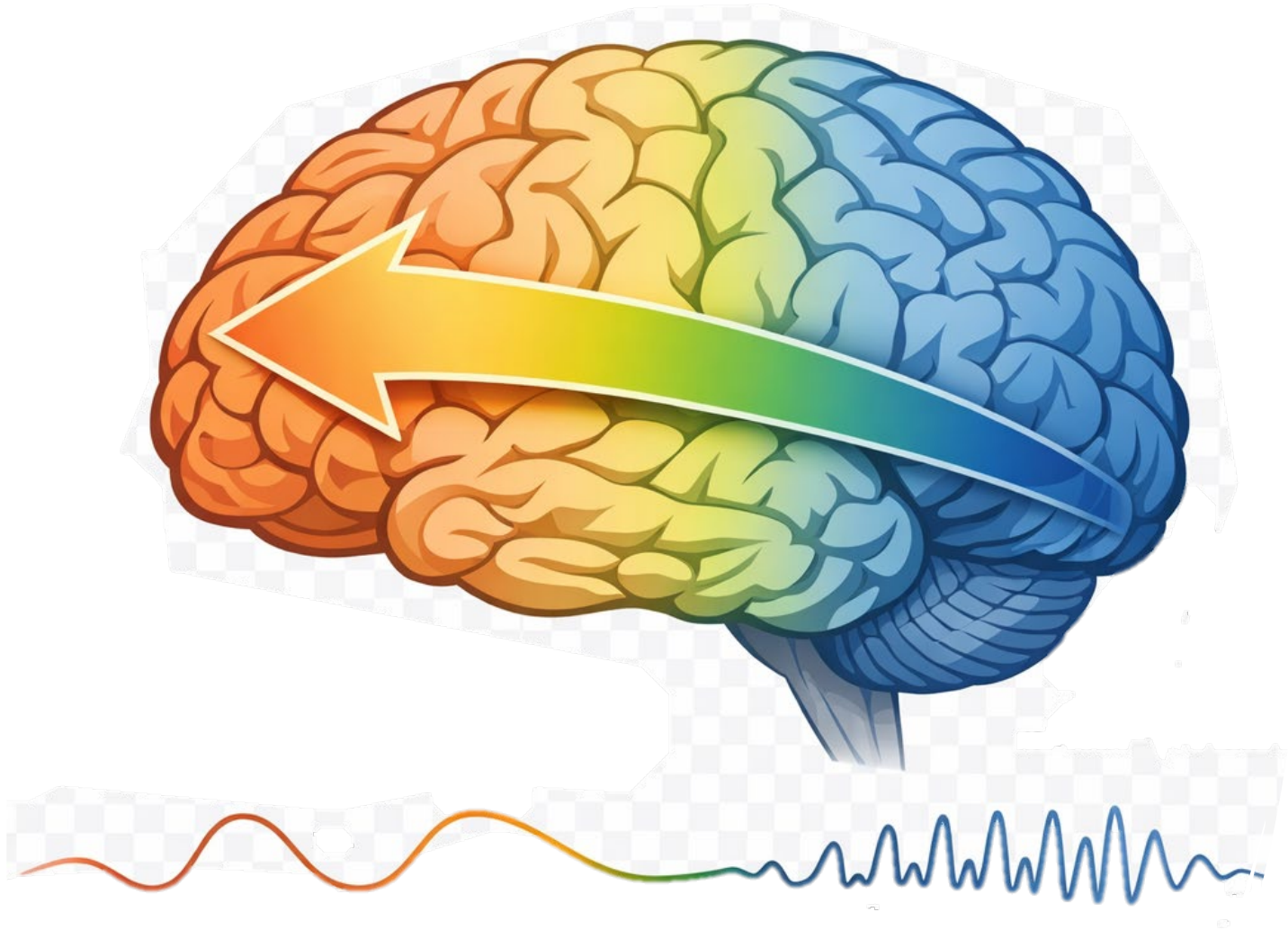
to put the toothpaste cap back on,

a pilot remembering how to do a safety checklist.



Human Information Processing

Visual,
Auditory,
Multisensory Pathways



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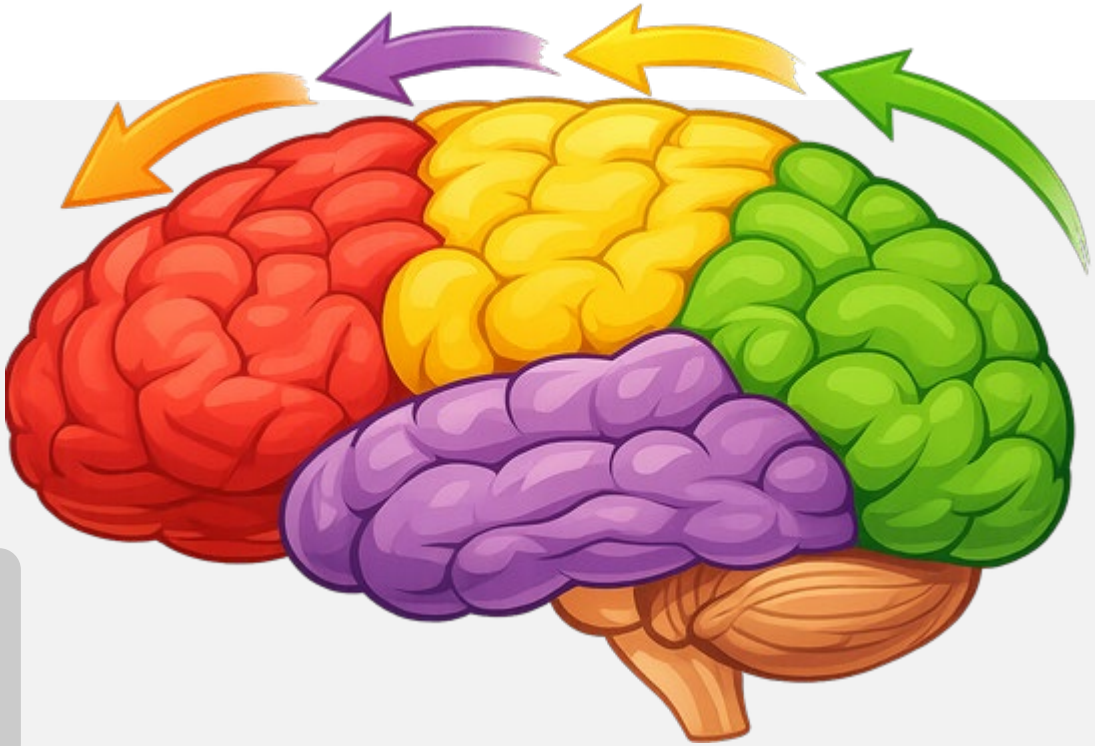
Overview



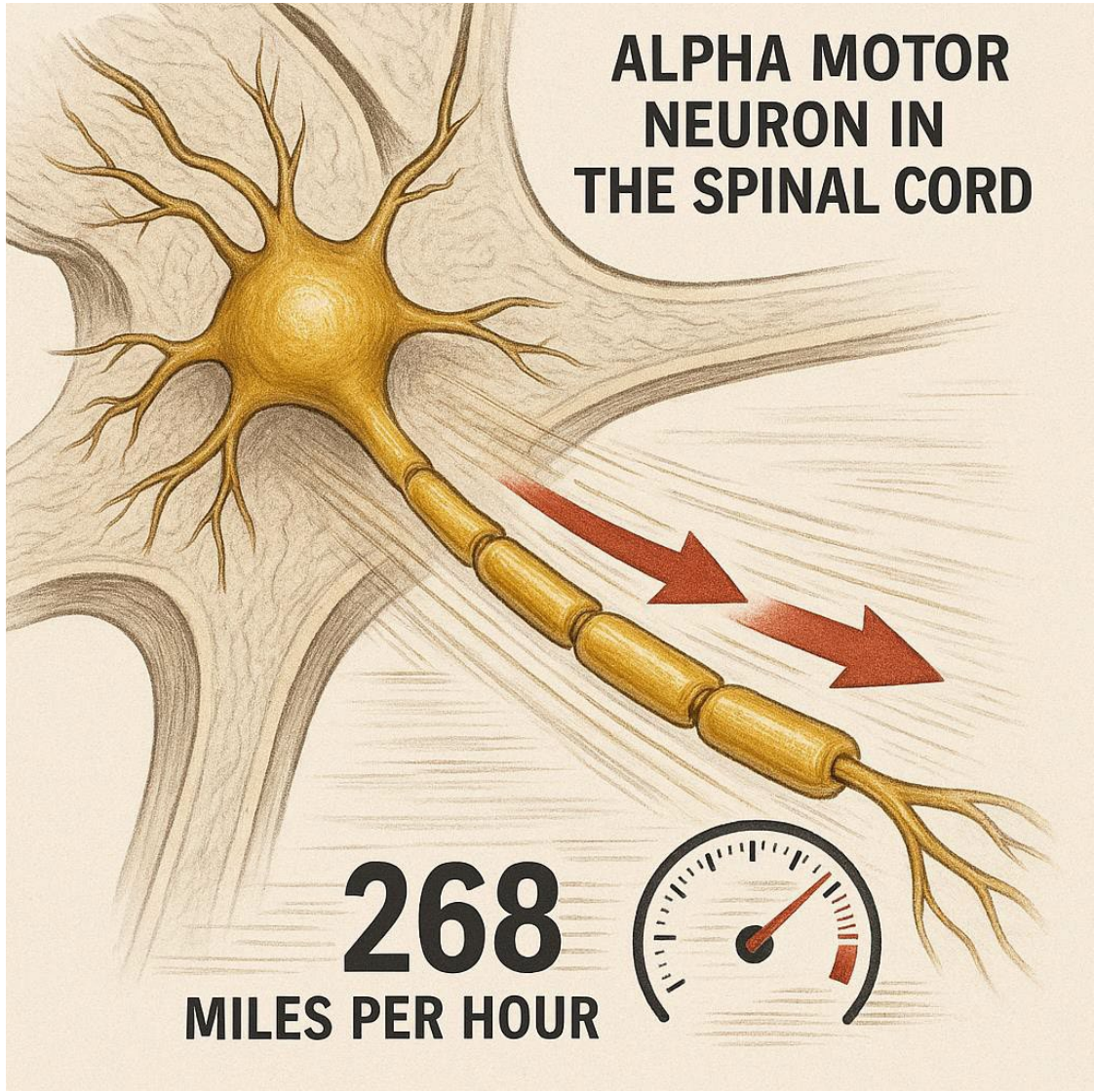
- Sensory input is processed in **POSTERIOR** brain regions
- Executive **functions occur in ANTERIOR** regions
- Visual and auditory pathways **converge in association cortices**

“Your Nervous System”

SPEED

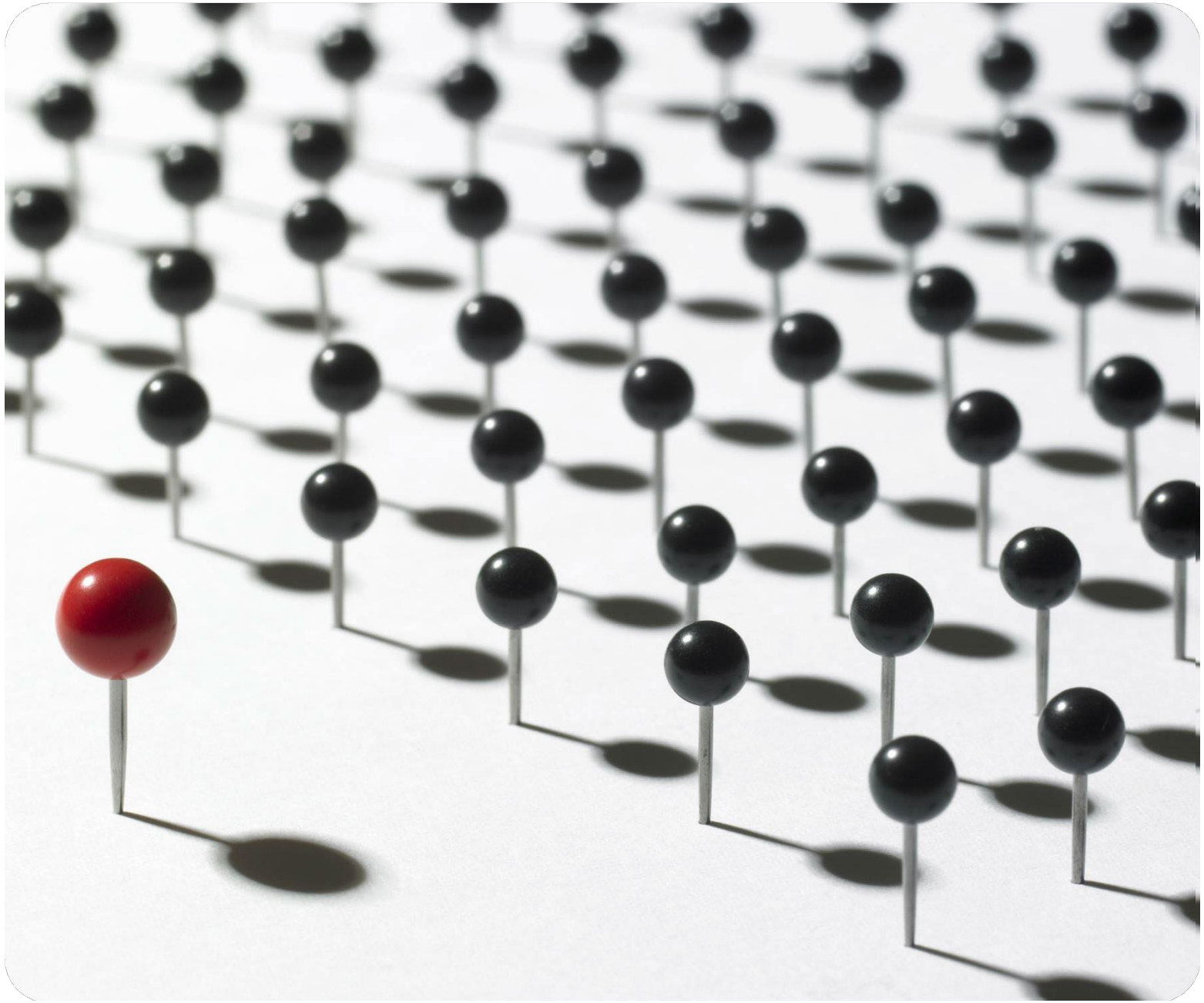
The largest myelinated neurons in your spinal cord can send signals at up to 268 miles per hour, faster than a Formula 1 race car.

Your brain also fires around 100 trillion synapses, constantly shaping thoughts, feelings, and actions.



Discover Magazine
The Nervous System, From 268-MPH Signals to Trillions of Synapses

Discover Magazine, The Nervous System, March 2011



Processing Speed

Processing speed depends on the efficiency of the frontal lobes in organizing and directing information flow.

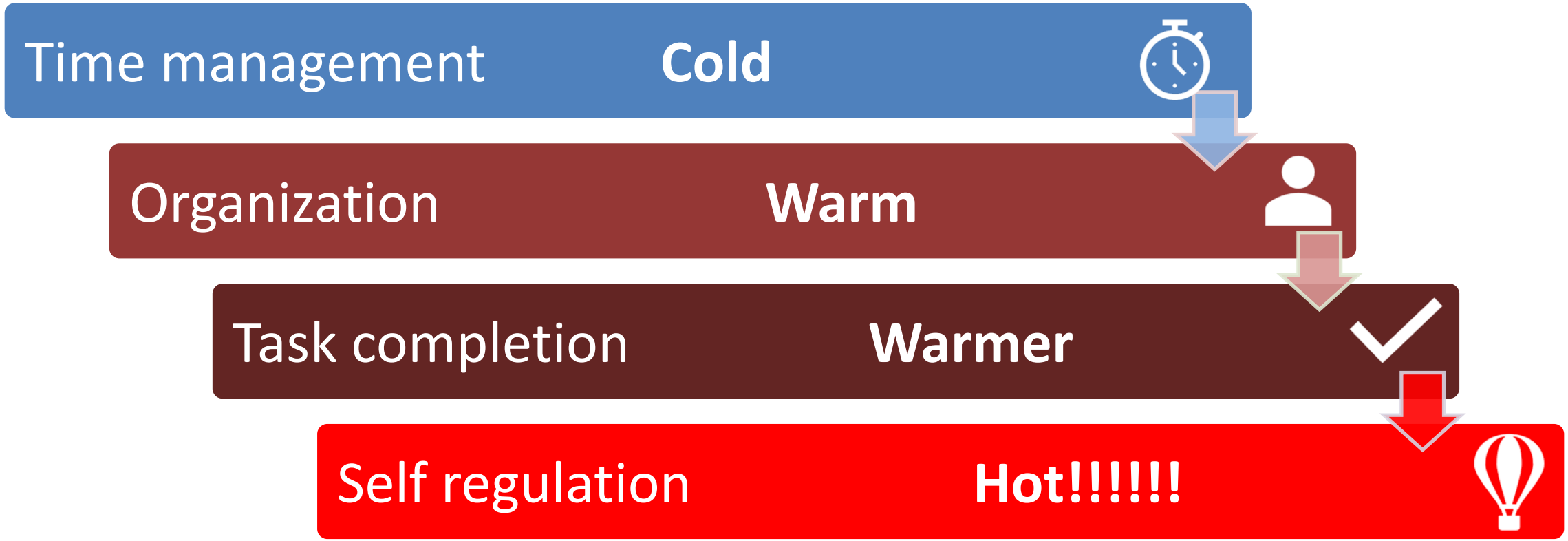
COLD(EF)

Cognitive Information being manipulated

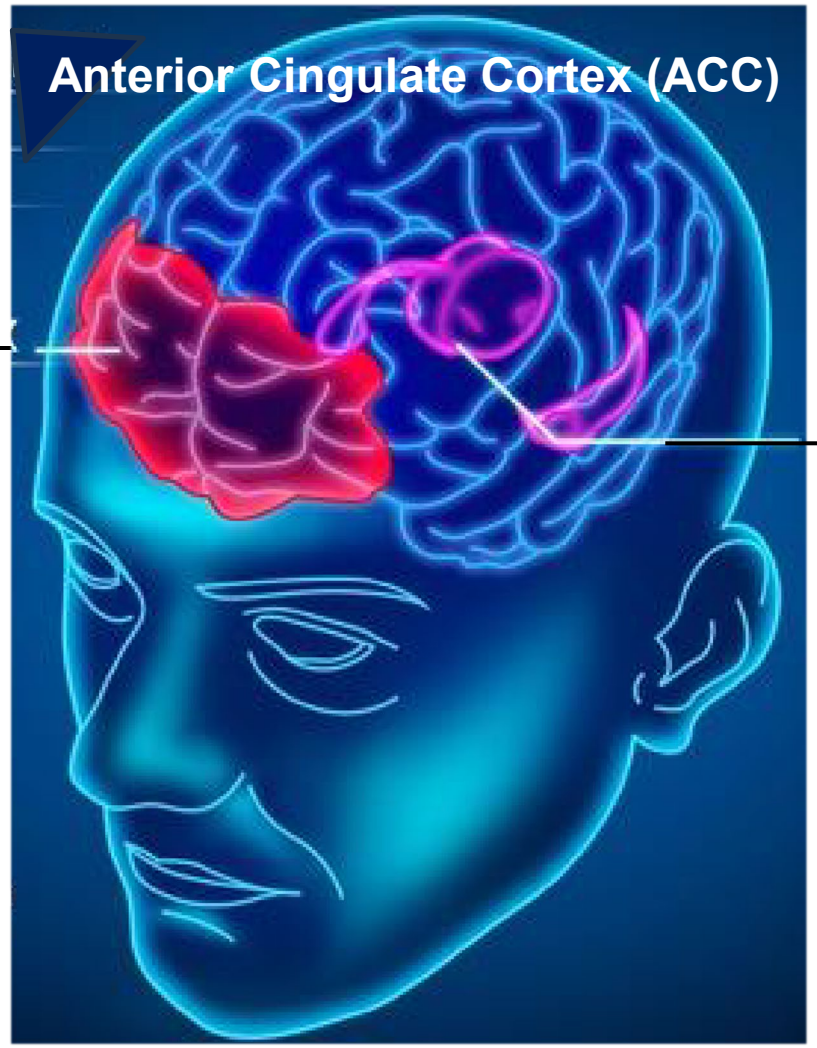
HOT (EF)

Self Regulation

Hot and cold Executive Functions (EF)



The corticolimbic system



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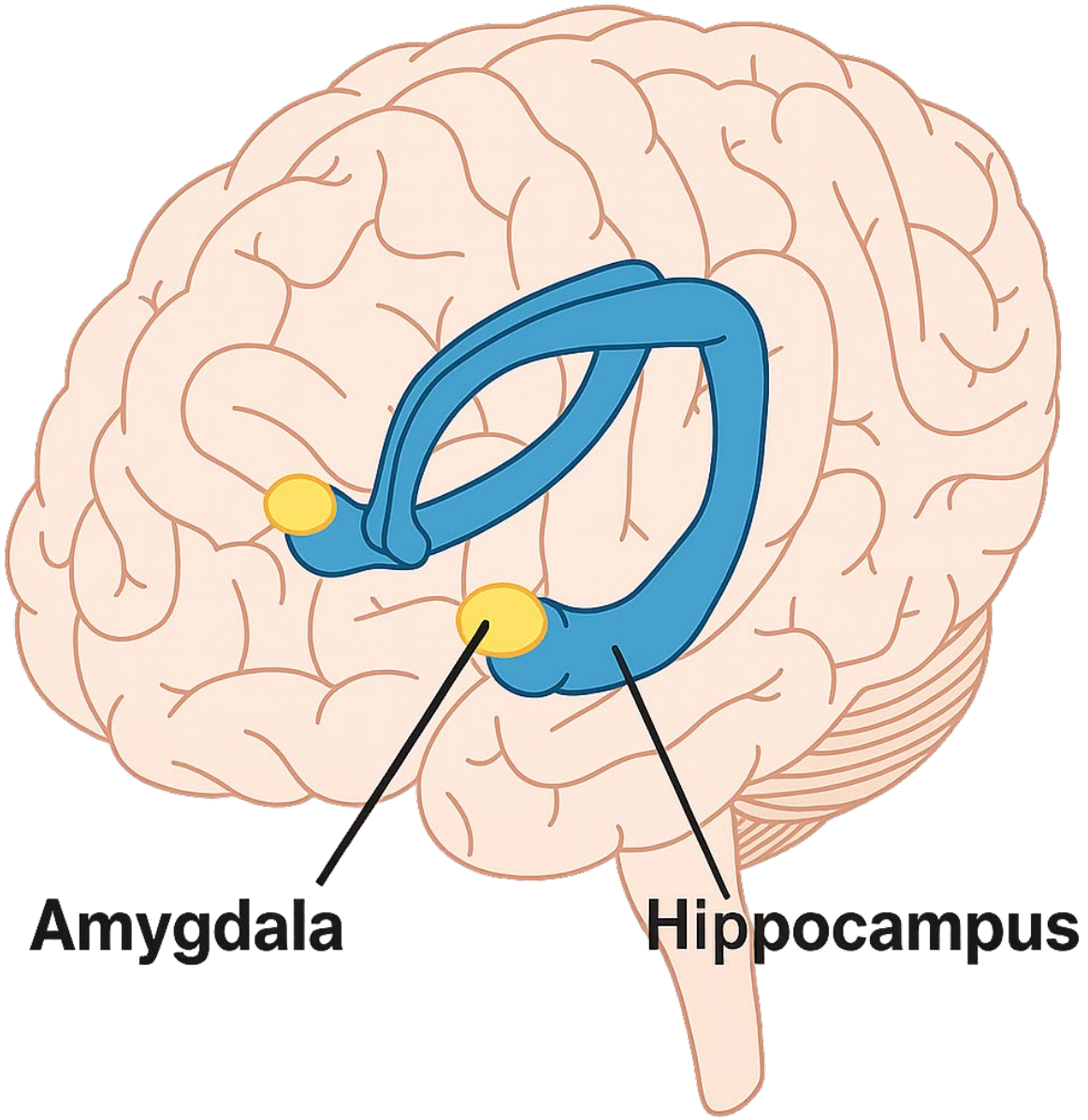
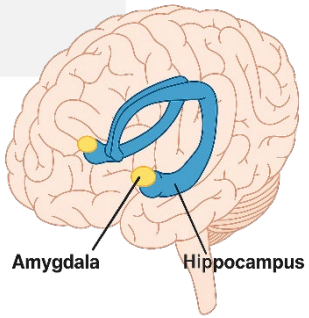
Amygdala & Hippocampus



Hot Executive Functions (EF)

- Fight
- Flight
- Freeze
- Lie-Working memory issue



Statistics

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References

ADDitude Magazine. (n.d.). *ADDitude*. https://www.additudemag.com/

Barrett, L. F. (2020). *Seven and a half lessons about the brain*. Houghton Mifflin Harcourt. ISBN 978-0-358-64559-7

Barkley, R. (2025, November 3). *What is executive function? 7 deficits tied to ADHD*. ADDitude.

Barkley, R. A. (2012). *Executive functions: What they are, how they work, and why they evolved*. Guilford Press.

Baum, S. M., Schader, R. M., & Owen, S. V. (2021). *To be gifted & learning disabled: Strength-based strategies for helping twice-exceptional students with LD, ADHD, ASD, and more* (3rd ed.). Free Spirit Publishing. ISBN 978-1-61821-644-1

Belsky, G. (n.d.). *What is executive function?* Understood.org.

Braaten, E., & Willoughby, B. (2014). *Bright kids who can't keep up: Help your child overcome slow processing speed and succeed in a fast-paced world*. Guilford Press. ISBN 978-1609184728

Center on the Developing Child. (n.d.). *Executive function & self-regulation*. Harvard University.

Children's Hospital of Philadelphia. (n.d.). *What are executive functions and how are they related to ADHD?* https://www.chop.edu/

Dawson, P., & Guare, R. (2018). *The work-smart academic planner: Write it down, get it done* (Rev. ed.). Guilford Press. ISBN 978-1462530205

References (Cont.)

Dawson, P., & Guare, R. (n.d.). *Creating resilience in neurodiverse children* (1st ed.). [Publisher not specified]. ISBN 978-1-949628-76-6

Evans, G. M., Johnson, R. L., & Geer, K. V. (n.d.). *The digital & knowledge-enabled manager's brain: Neuroscience and strategy* (1st ed.). [Publisher not specified]. ISBN 978-1-949628-69-8

Martínez, J. H. (2015, April 6). *Tutorial for complex brain networks*. Neurocomplexity.

Morin, A. (n.d.). *Trouble with self-regulation: What you need to know*. Understood. Reviewed by Braaten, E., PhD.

Orban, S. A., Rapport, M. D., Friedman, L. M., & Kofler, M. J. (2014). Executive function/cognitive training for children with ADHD: Do results warrant the hype and cost? *The ADHD Report, 22*(8), 8–14.

Rodden, J. (2025, October 2). *What is executive dysfunction? Signs and symptoms of EFD*. ADDitude.

Schwartz, T., & McCarthy, C. (2007). Manage your energy, not your time. *Harvard Business Review, 85*(10), 63.

Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization*. Broadway Business.

Website References

ADDitude Magazine. (n.d.). ADDitude. https://www.additudemag.com/

Children's Hospital of Philadelphia. (n.d.). What are executive functions and how are they related to ADHD? https://www.chop.edu/