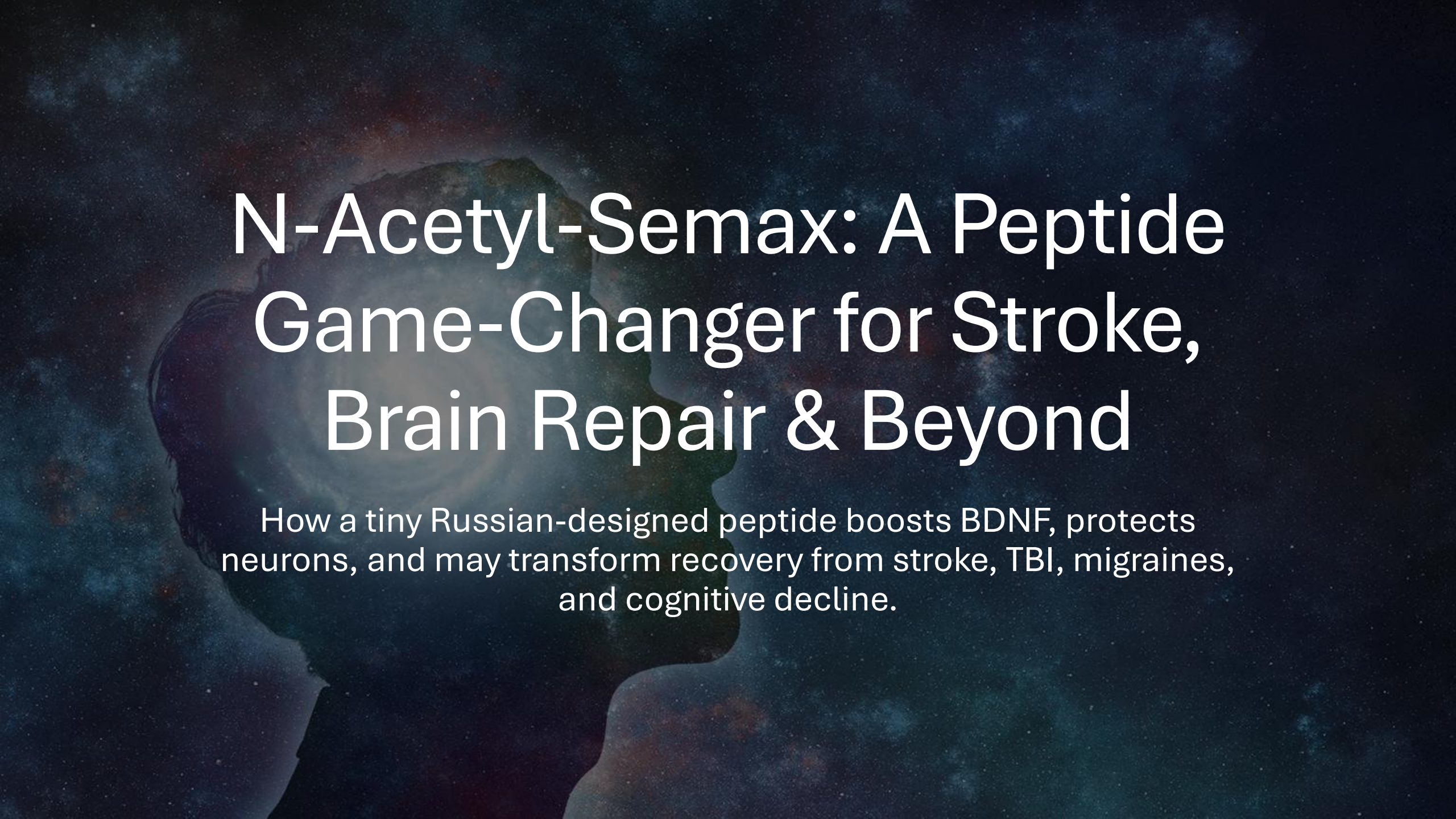


N-Acetyl-Semax: A Peptide Game-Changer for Stroke, Brain Repair & Beyond

How a tiny Russian-designed peptide boosts BDNF, protects neurons, and may transform recovery from stroke, TBI, migraines, and cognitive decline.

What Sparked Today's Topic

- A gentleman (87, Florida) mentioned a peptide he was researching
- I had never heard of it
- A few hours of digging later…
- **WOW — I had to share this today**

What Is Semax?

- Developed in Russia in the 1990s
- Fragment of ACTH that protects the brain
- Used for:
  - Stroke
  - TBI
  - Cognitive impairment
  - Optic nerve ischemia
- Non-stimulant • Non-sedating • Not habit-forming

The Russian Origins of Semax:

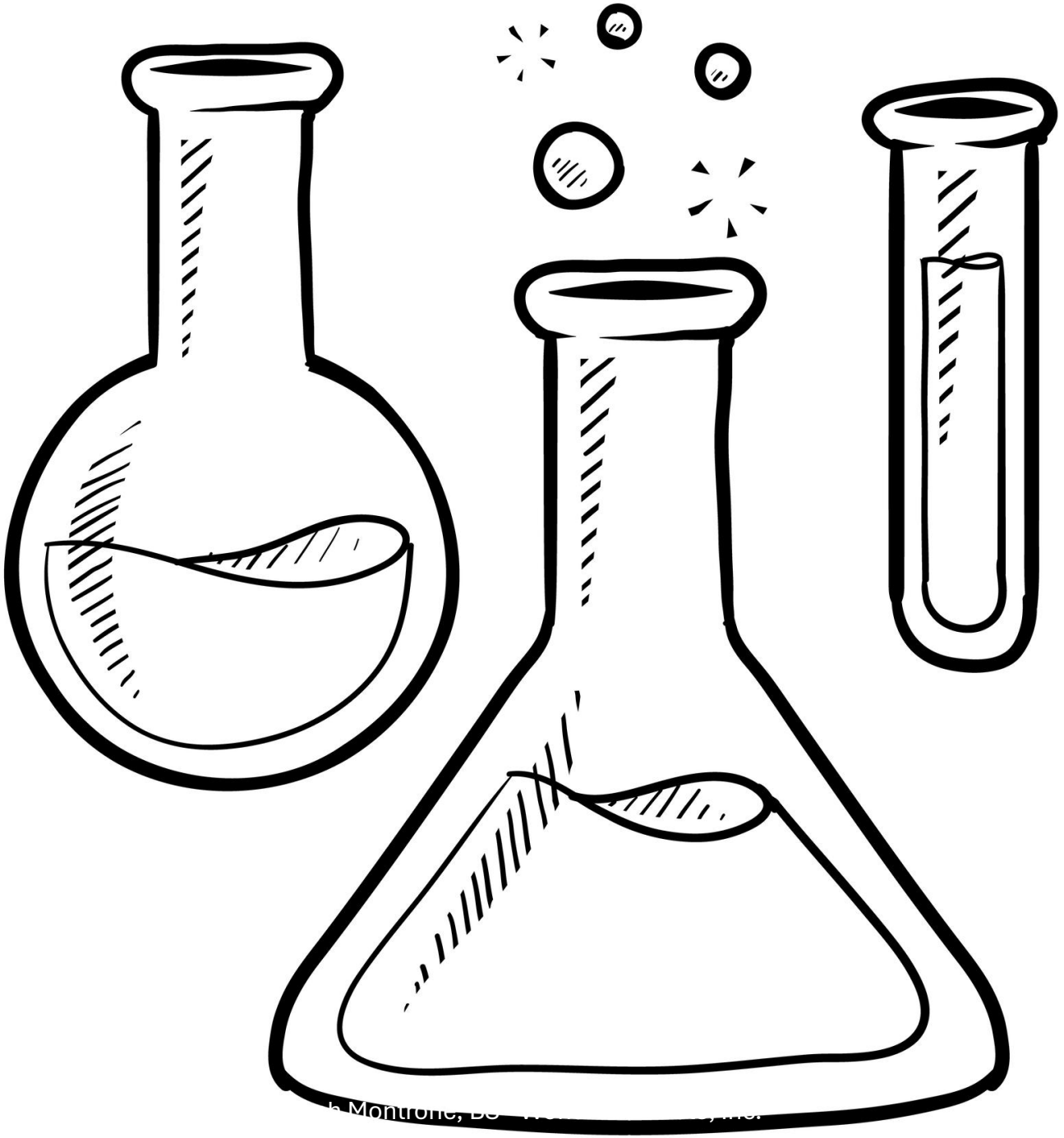
A 1990s Neuroprotective Breakthrough

Where Semax Came From — ACTH(4–7) Peptide Research

- Russian researchers knew that:
- ACTH(1–39) → has hormonal effects
- ACTH(4–10) → produces **neurotrophic, cognitive, and neuroprotective** effects without endocrine actions
- They developed a **stable synthetic analog** of ACTH(4–10) by attaching the Pro-Gly-Pro tripeptide at the C-terminus.

This created what they called:
MEHFPGP

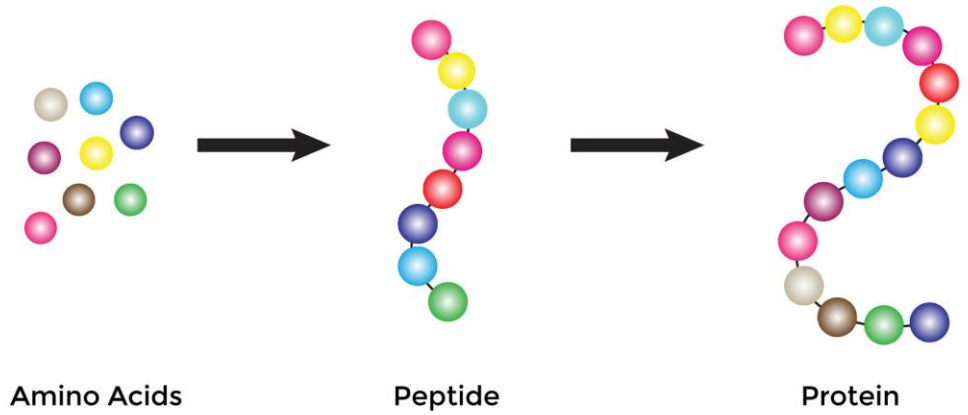
- (Met-Glu-His-Phe-Pro-Gly-Pro)
- Which later became known globally as…



Semax

- This tiny 7–amino-acid peptide turned out to:
- prevent neuronal death
- promote BDNF expression
- enhance neuroplasticity
- support learning and memory
- improve microcirculation in ischemic tissues
- And all **without** affecting cortisol, ACTH output, or adrenal function.

This was a ***huge*** discovery.



Russian Approval and Clinical Status

- Semax was:
- ✔️ **Developed at the Institute of Molecular Genetics, Russian Academy of Sciences**
- ✔️ **Clinically tested at the N.P. Bechtereva Institute of Brain Research**
- ✔️ **Approved for medical use in Russia in 1994**
- ✔️ **Added to the Russian List of Vital & Essential Medicines**
- This last point is enormous:
  Only medications considered medically indispensable for the nation's health system are included.

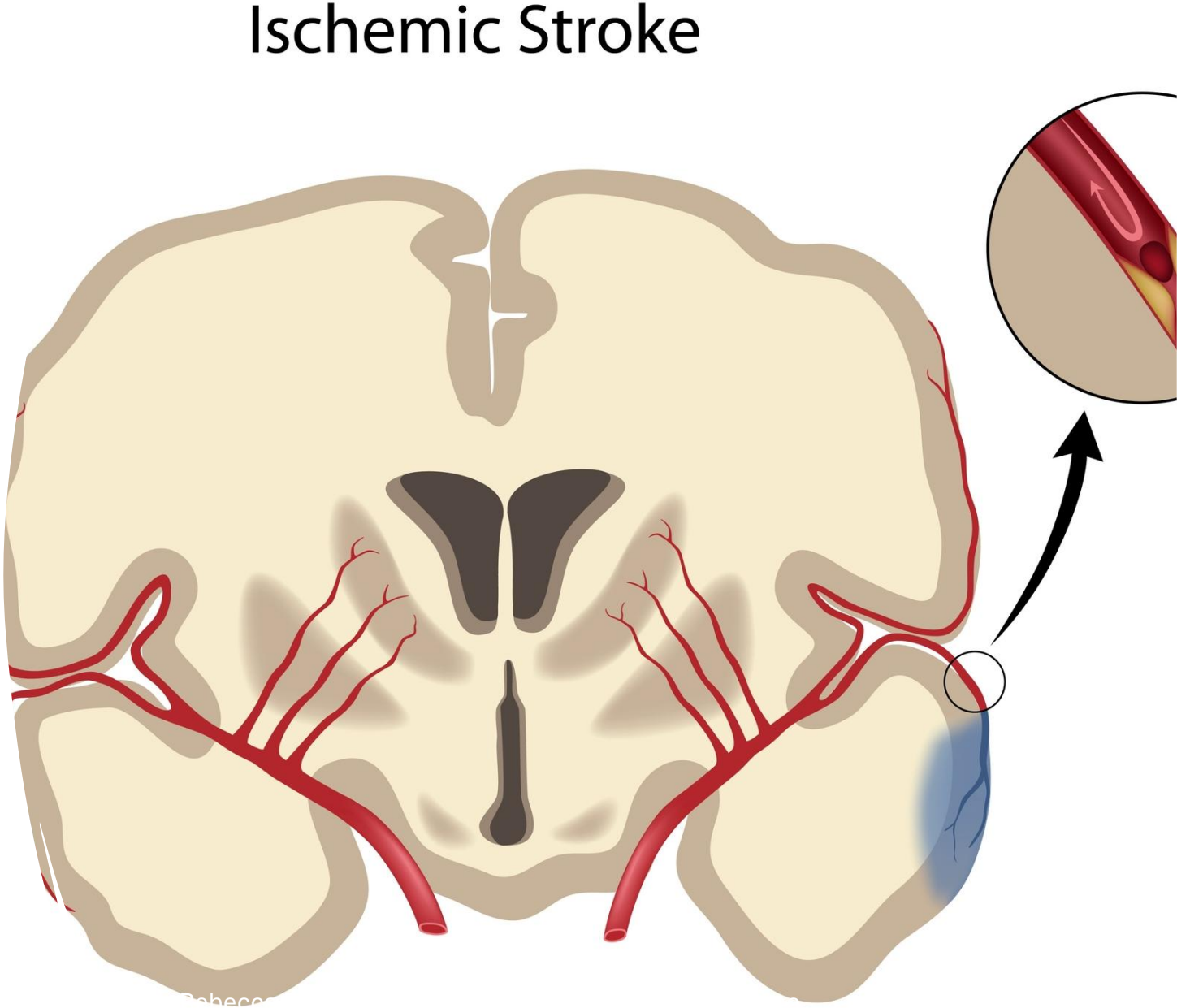
Semax remains on that list to this day.

Clinical Use in the 1990s

Once approved, Semax was used in Russian hospitals for:

1. Ischemic stroke

- Given in the acute phase and early rehab
- Shown to improve functional outcomes, attention, motor recovery
- Reduced post-stroke neuroinflammation
- Increased cerebral blood flow in damaged regions



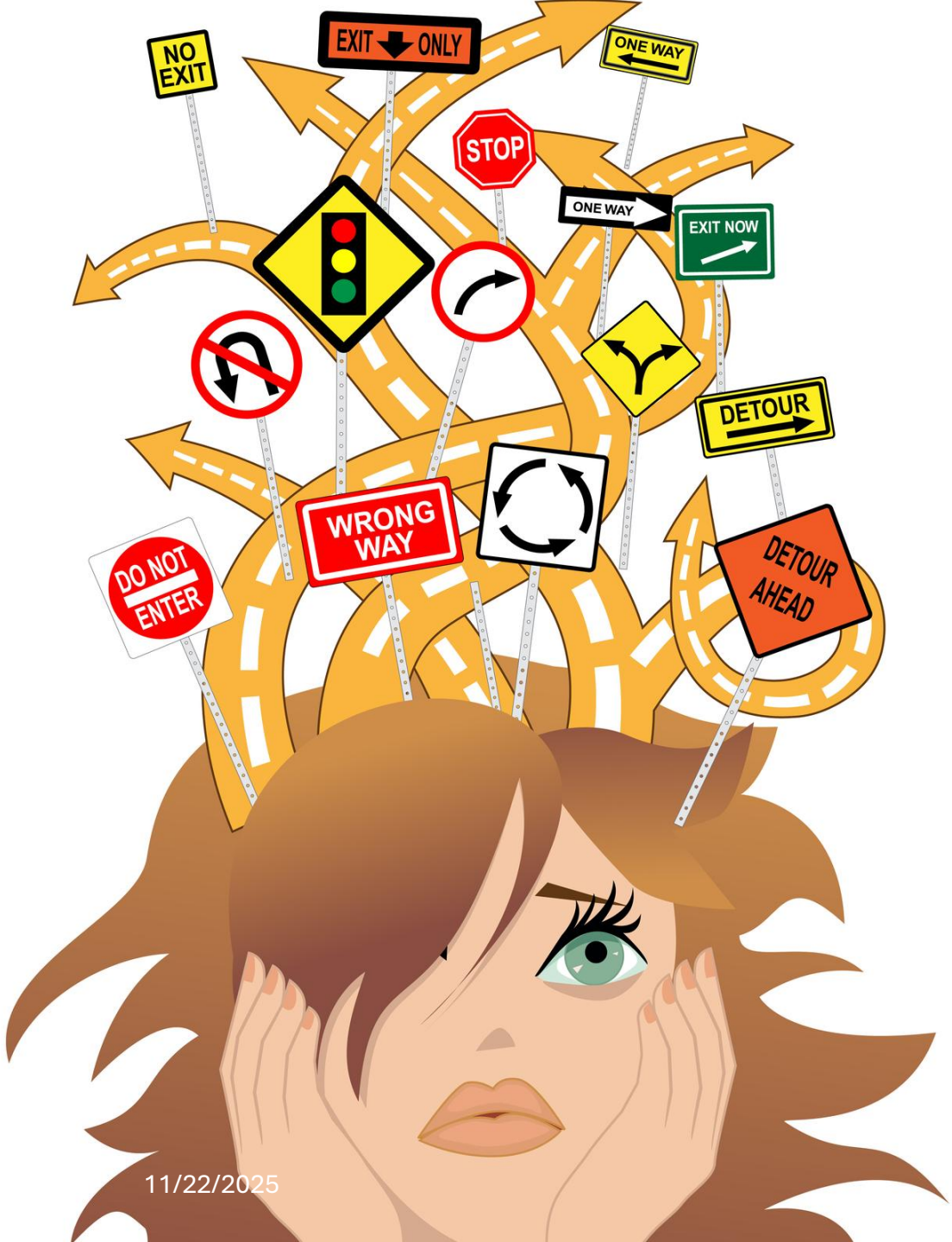
2. Transient ischemic attack (TIA)

To prevent lasting cognitive deficits.

- FYI: **Transient Ischemic Attack (TIA)**
- A **brief, temporary blockage of blood flow to the brain** that causes stroke-like symptoms but **does not cause permanent damage**.
  Often called a “mini-stroke,” a TIA is a **warning sign** that a major stroke may occur if underlying causes aren’t addressed.

3. Traumatic brain injury

Particularly mild-to-moderate, including concussions.



4. Attention and cognitive dysfunction

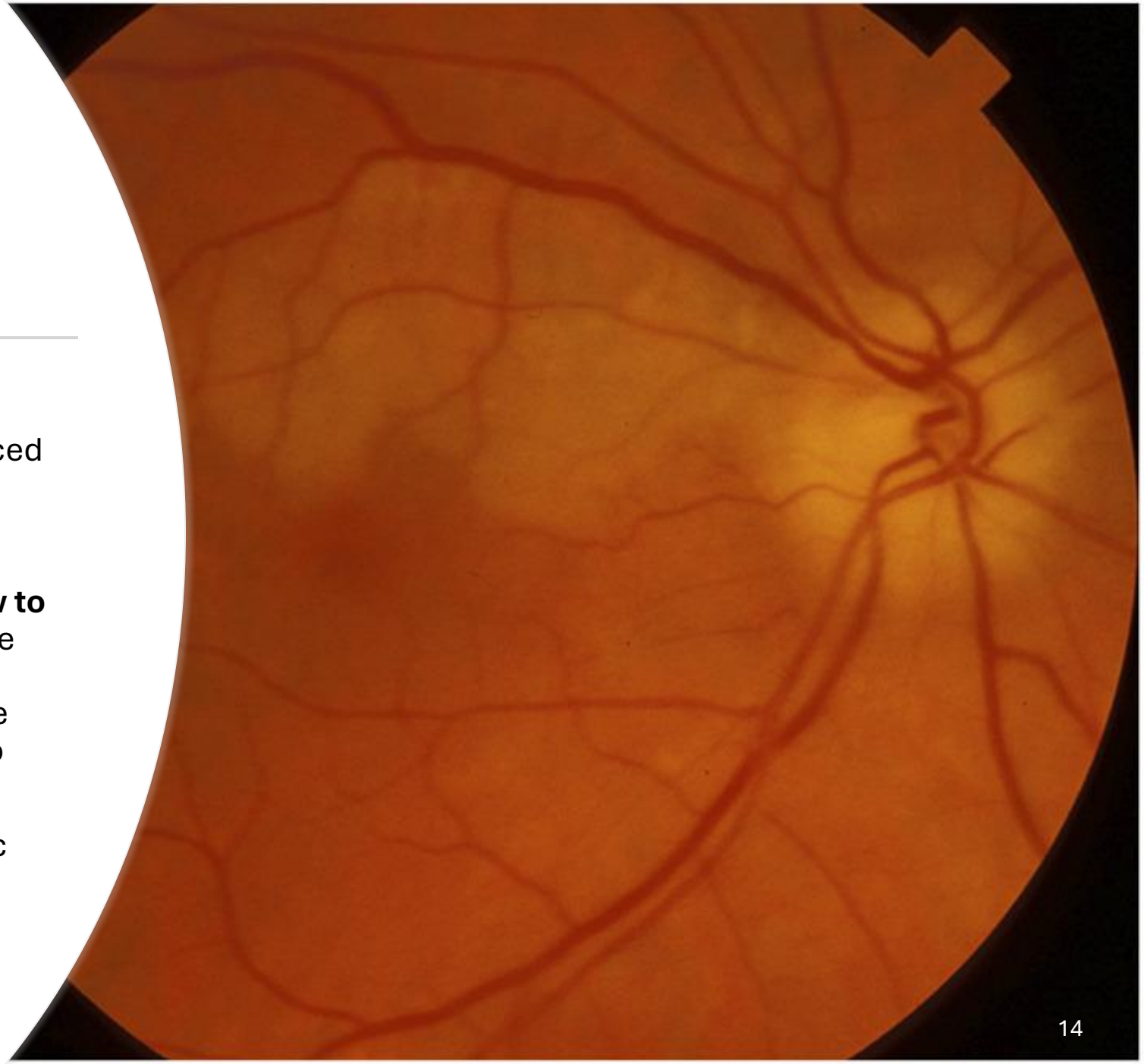
- Used in adults and children for:
- ADHD-like symptoms
- memory impairment
- slowed processing
- hypoxia-related cognitive slowing

5. Optic nerve ischemia

Ophthalmologists adopted Semax because it improved optic nerve microcirculation and reduced ischemic injury.

FYI: **Optic Nerve Ischemia — What Happens?**

- Optic nerve ischemia occurs when **blood flow to the optic nerve suddenly drops**, depriving the nerve fibers of oxygen and nutrients.
  Without adequate circulation, the nerve tissue becomes **injured or dysfunctional**, leading to rapid, often painless vision loss.
- The damage is similar to a “stroke” of the optic nerve.

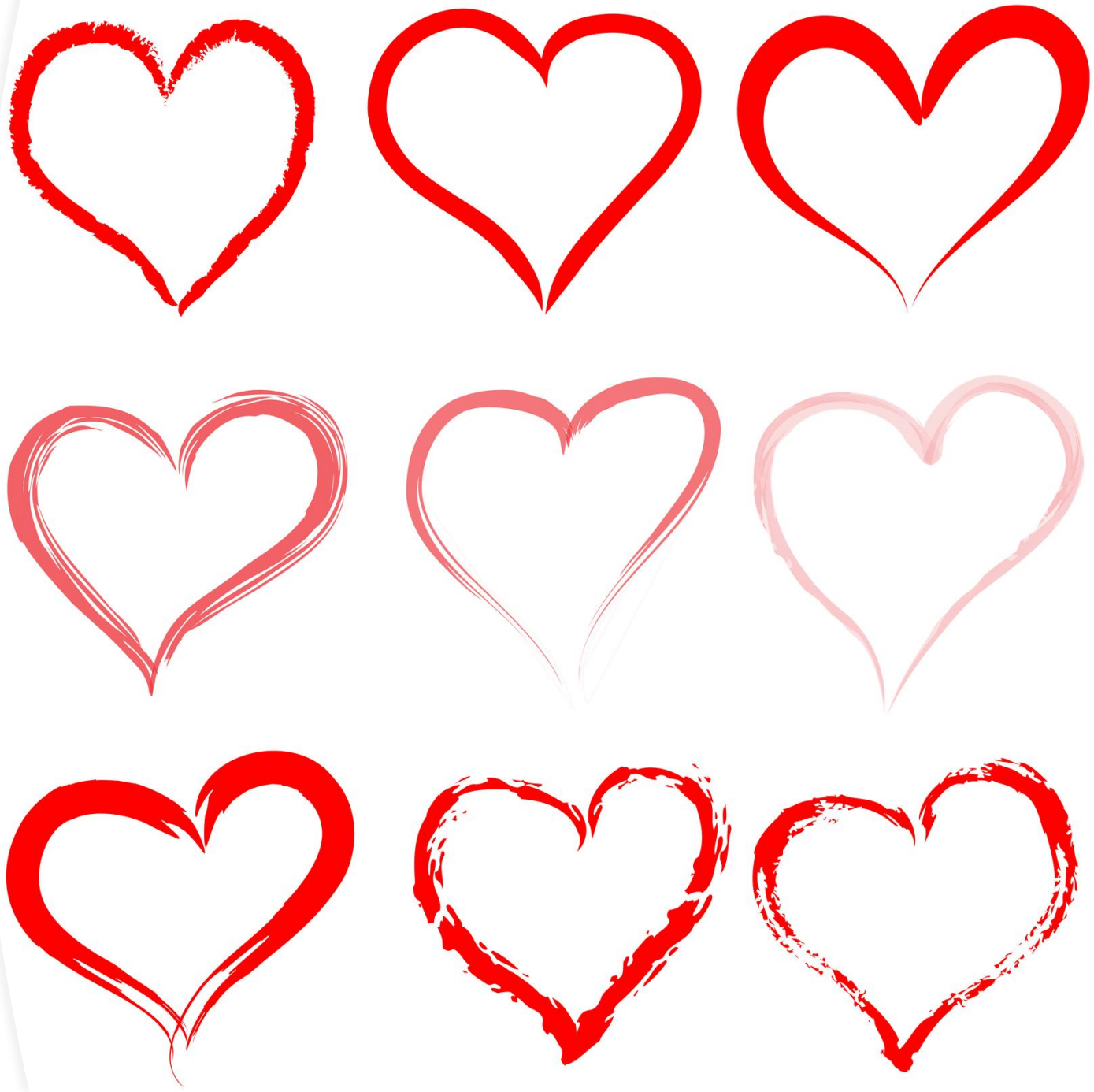


Why Russia Loved Semax

It checked all the boxes the country wanted in a neuroprotective agent:

What’s not to love?

- **Not psychostimulant**
- **Not sedative**
- **Not addictive**
- **Not hormonal**
- **Long-lasting synaptic effects**
- **Improves blood flow**
- **Enhances neuroplasticity**
- And it was dirt-cheap to make compared to Western pharmaceuticals.



Russia heavily favored **peptide medicines** because:

- they act on endogenous regulatory pathways
- they are extremely safe
- they rarely cause organ toxicity
- they can be administered intranasally (no doctor needed for injections)
- This fit perfectly with the Russian preference for:

Regulatory peptides over synthetic pharmacology.

The Russian Philosophy Behind Semax

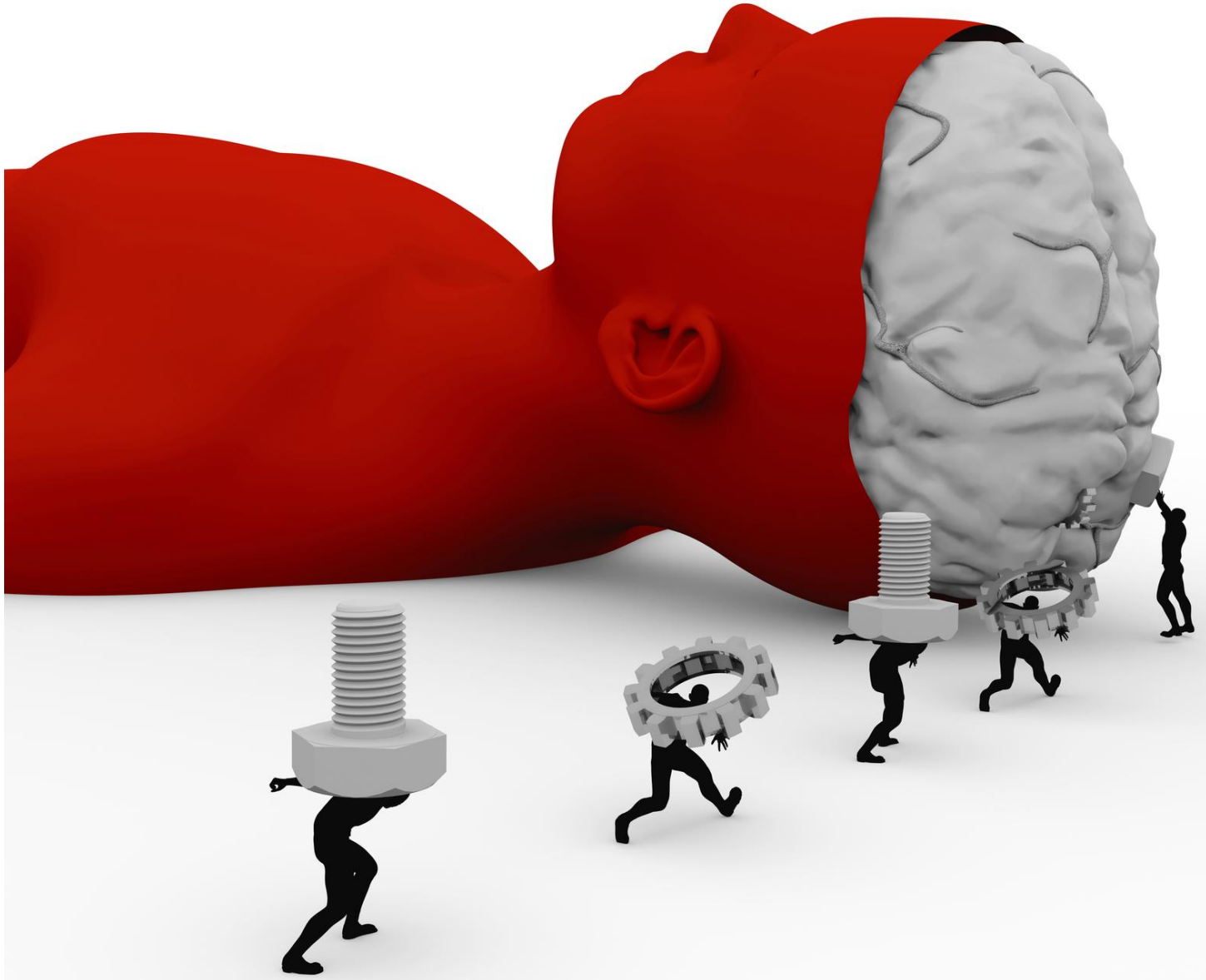
*In Russia, Semax was seen not as a "drug," but as a **neuromodulatory tool** that enhances the brain's own repair machinery.*

They believed:

“If you give the brain the signals it already uses to repair itself, you can accelerate recovery without forcing the body chemically.”

Thus, Semax was viewed as:

- a **homeostatic corrector**
- a **neurotrophic enhancer**
- a **microcirculation support peptide**
- a **stress-defense peptide**



This philosophy is what led to the entire family of peptides:

- Semax
- Selank
- Pinealon
- Epitalon
- Thymalin
- Cortexin

All stemming from this same school of thought.

Semax in Military and Cosmonaut Programs

In the 1990s, Semax was tested for:

The use of Semax resulted in improved:

- pilot performance
- oxygen deprivation resilience
- sustained attention under stress
- cognitive endurance in cosmonauts

Results showed:

- better error resistance
- improved working memory
- faster recovery from stress and hypoxia
- no stimulant crash
- It became part of Russian “neuro-resilience medicine.”

Why the U.S. Never Adopted Semax

Three reasons:

And those reasons include…

1. It's a peptide

- Pharma patent opportunities were limited.

2. It didn't fit the Western model

- It's not a stimulant, sedative, antidepressant, or anti-inflammatory.
  It modulates *gene expression*.
  That's hard to commercialize.

3. No U.S. pharmaceutical company funded large trials

- Without industry backing, FDA approval wasn't pursued.

*Thus, Semax remained a **Russian essential medicine** and became a **U.S. nootropic research peptide**.*

🌟 In Summary - Semax in 1990s Russia:

- Developed by Russian Academy of Sciences
- Approved in 1994
- Listed as an essential medicine
- Used for stroke, TBI, cognitive impairment, optic nerve ischemia
- Extensively used in military and space programs
- Designed as a non-hormonal ACTH fragment with neuroprotective properties
- Dramatically boosts BDNF and neuroplasticity
- Safely administered intranasally

What Is *N-Acetyl*-Semax?

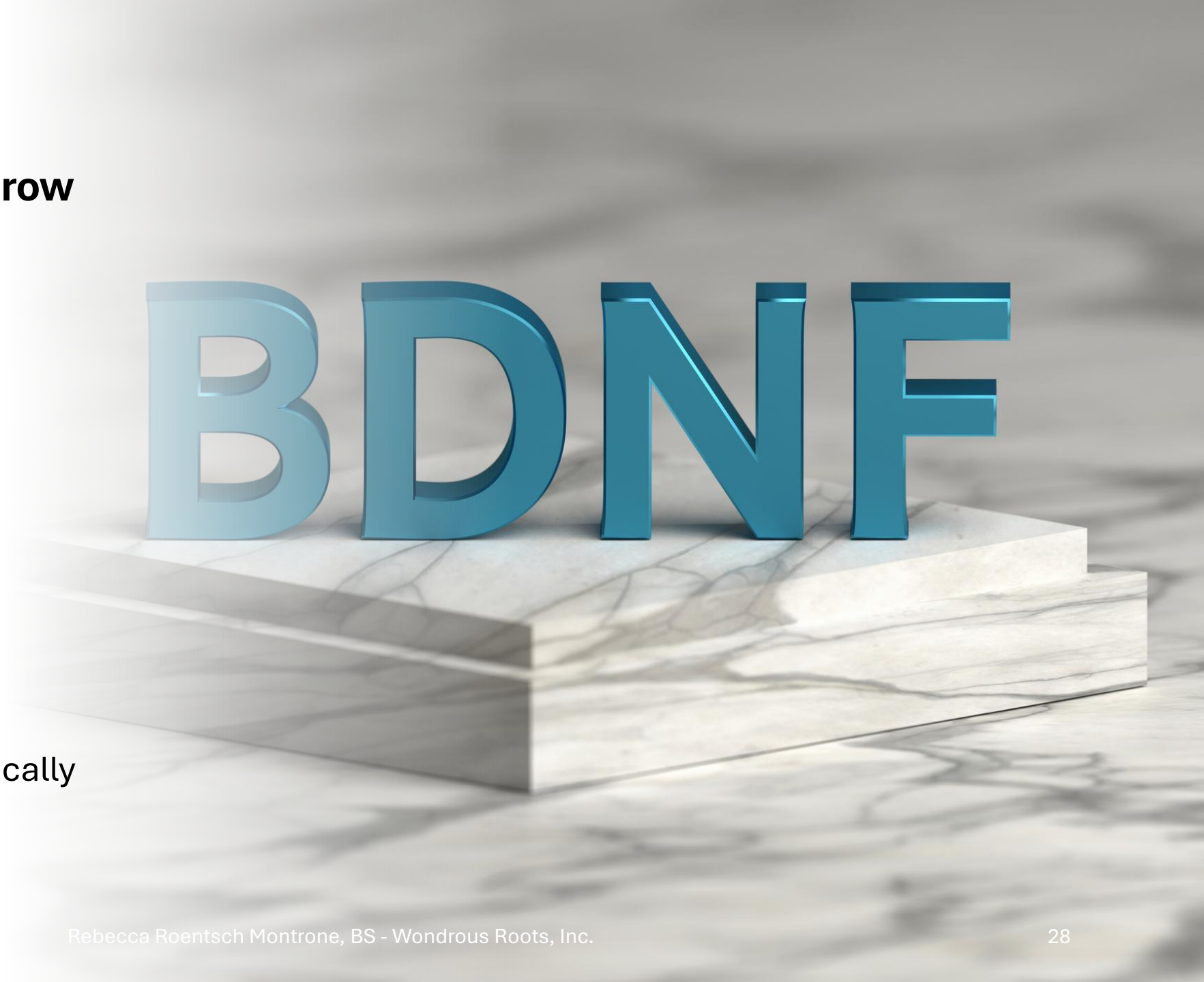
- A **next-generation analog** of Semax
- More stable, more bioavailable
- Longer-lasting
- Stronger neurotrophic effects
- Sold in the U.S. only as a research peptide

Why Scientists Are Excited

- **This peptide:**
- ↑ **BDNF** (big-time)
- ↑ Neuroplasticity
- ↑ Synaptic repair after stroke/TBI
- ↓ Brain inflammation
- ↑ Dopamine & serotonin balance
- ↑ Mitochondrial efficiency in neurons

BDNF: The Brain's "Grow & Repair" Molecule

- BDNF = brain-derived neurotrophic factor
- Essential for:
  - Learning
  - Memory
  - Attention
  - Nerve repair
  - Neuroprotection
- N-acetyl-semax dramatically increases it



Where N-Acetyl-Semax May Be Helpful

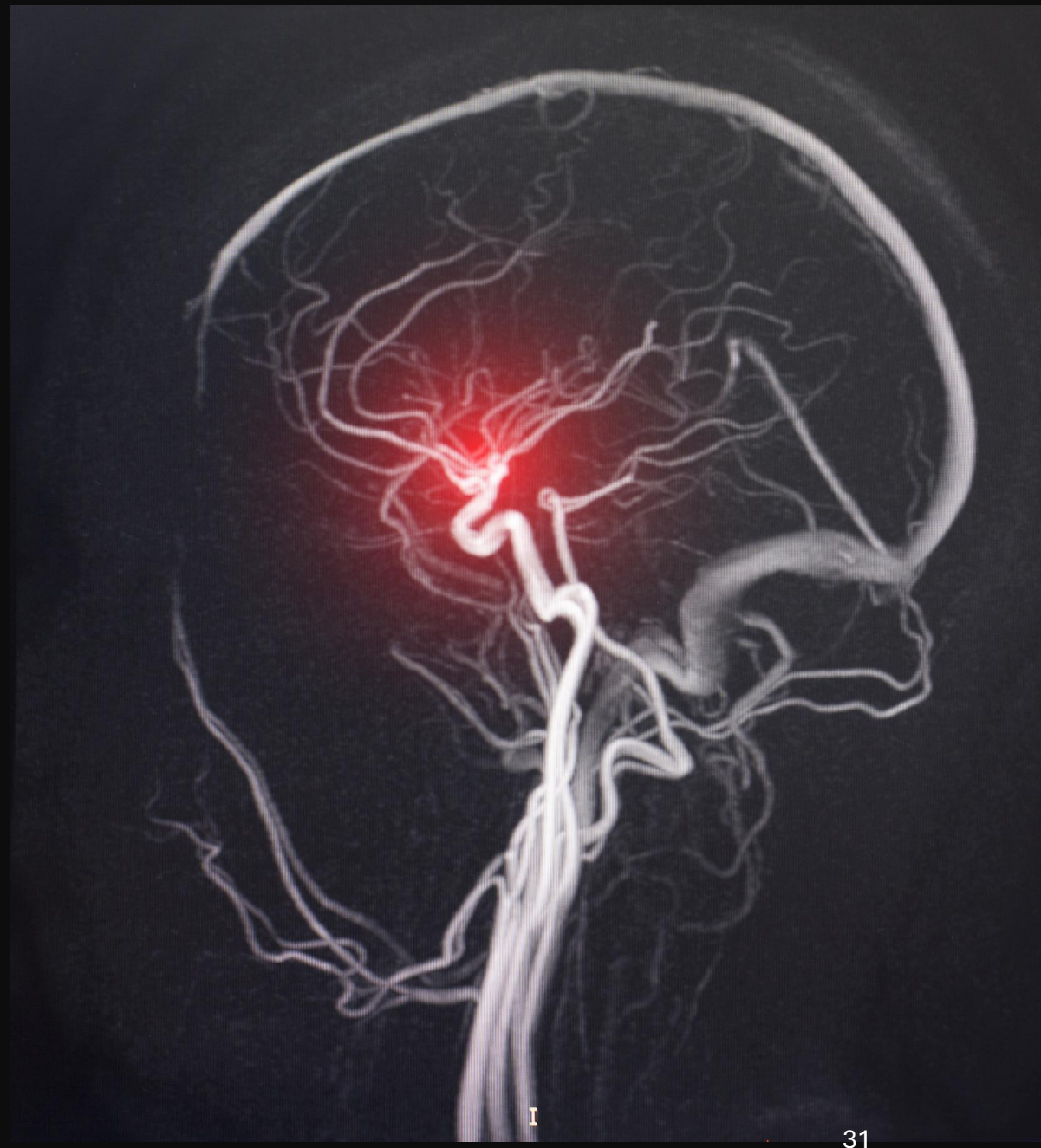
- Stroke recovery (even chronic)
- Traumatic brain injury / concussion
- Cognitive decline / brain fog
- Migraines
- Neuropathy
- Post-stroke depression/apathy
- Neurodegenerative disorders (supportive role)

How It Works

- **Five pillars of action:**
- Boosts BDNF
- Protects neurons from inflammation
- Improves microcirculation in the brain
- Enhances mitochondrial function
- Normalizes stress neurotransmitters

Stroke & Brain Repair

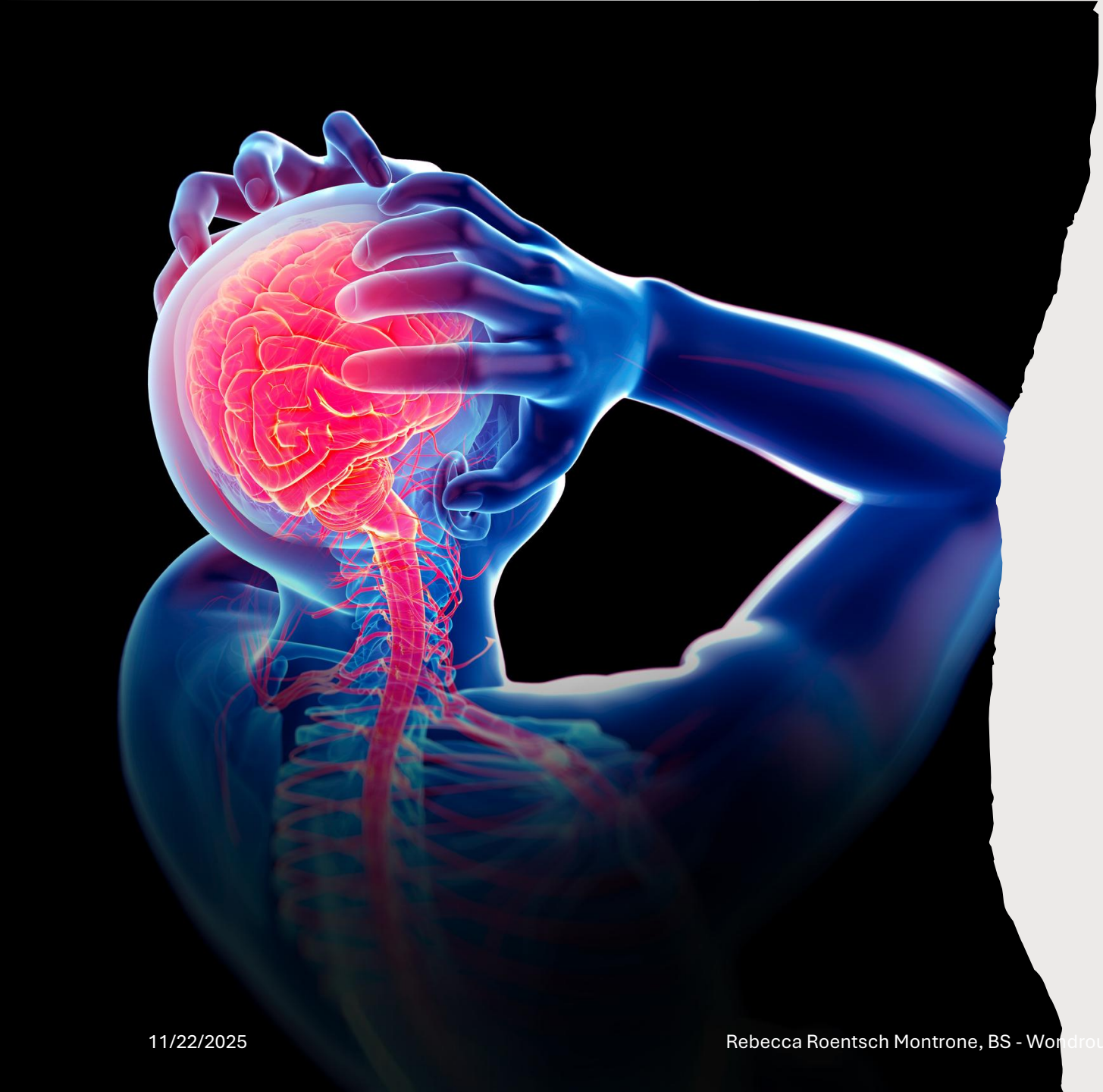
- Promotes rewiring of damaged pathways
- Supports speech, motor, and cognitive recovery
- Reduces inflammatory injury after ischemia
- Helps the brain “learn again”



TBI / Concussion

- Enhances cognitive speed
- Improves focus and working memory
- Calms neuroinflammation
- Supports long-term repair

Rebecca Roentsch Montrone, BS - Wondrous Roots, Inc.



Migraine

- Reduces brain excitability
- Calms trigeminal inflammation
- Supports mitochondrial energy
- Beautiful synergy with magnesium-L-threonate, RLA, CoQ10, glutathione

Mood & Motivation

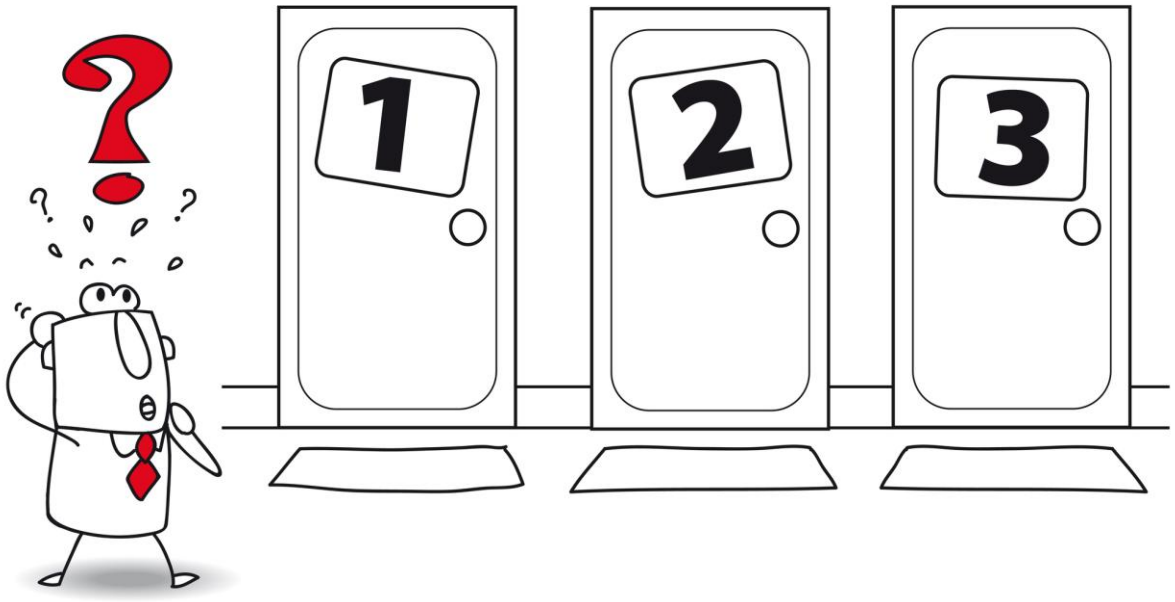
- Gentle dopaminergic support
- Normalizes serotonin tone
- Used in Russia for depressive symptoms
- No sedation • No stimulation

Safety Notes

- Not FDA-approved (big deal, right?)
- Generally well tolerated
- Possible mild nasal dryness or temporary headache
- Sold in U.S. as “research peptide — not for human consumption”

BUT – the good news is, we CAN get it and use it; we just have to agree that we are purchasing it for “research purposes only.” ***Oy, Vey!***

Semax vs N-Acetyl-Semax vs N-Acetyl-Semax Amidate



*Think of these three as **good → better → best** in terms of stability, brain penetration, and potency.*

Rebecca Roentsch Montrone, BS - Wondrous Roots, Inc.

1. Plain Semax (the original)

What it is:

- A synthetic peptide derived from ACTH(4-7) + Pro-Gly-Pro.
- Created in Russia; used clinically for stroke, TBI, cognitive impairment.

Pros:

- Proven human clinical use (Russia).
- Strong BDNF upregulation.
- Neuroprotective and anti-inflammatory.

Limitations:

- Less stable.
- Shorter duration of action.
- Lower lipophilicity → reduced BBB penetration compared to the newer analogs.
- Requires higher/frequent dosing.

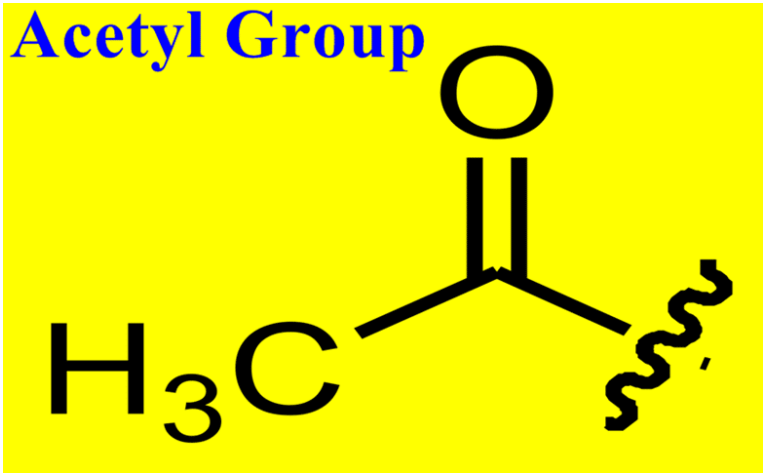
Think of **plain Semax** as the *baseline therapeutic peptide*.

2. N-Acetyl-Semax (NAS)

(NAS = Semax with an acetyl group added to the N-terminal)

What the acetylation does:

- Increases stability
- Increases lipophilicity
- Improves blood-brain barrier penetration
- Extends duration in circulation
- Enhances gene expression effects (BDNF, NGF, synaptic plasticity)



Functional upgrade:

- Stronger mood effects
- Stronger neuroplasticity signal
- Lower dose required for similar (or enhanced) effects

Best use cases:

- Cognitive enhancement
- Stroke support
- TBI recovery
- Mood/apathy
- Migraine support

*NAS is **noticeably more potent** than plain Semax.*

3. N-Acetyl-Semax *Amidate* (NAS-A or NA-Semax-Amidate)

This is the “premium” version used in higher-end nootropic circles.

What the *amidation* does:

- Converts the C-terminal carboxyl group into an *amide*
- Dramatically increases resistance to enzymatic breakdown
- Further improves stability in the nasal mucosa
- Enhances half-life
- Increases potency again compared to N-acetyl-Semax

Why amidation matters:

- Peptides are normally broken down quickly → amidation slows that down
- More peptide reaches the brain intact
- Lower doses needed
- Effects feel “cleaner” and more sustained

WHY IT MATTERS?

1.
2.
3.

People who use NAS-Amidate often report:

- Stronger focus
- Markedly enhanced BDNF-driven “neuroplasticity” feel
- Deeper calm/anti-anxiety effects
- Less frequent dosing required

Amidation = the biochemical equivalent of adding armor.

Bottom-Line Summary

- **Semax**
  → the classic Russian medical peptide (effective but less stable)
- **N-Acetyl-Semax**
  → upgraded for better brain penetration, stronger BDNF, longer action
- **N-Acetyl-Semax *Amidate***
  → *the most stable*, longest-lasting, highest-potency version
  (“Acetyl + armor plating.”)

Semax & Neurodegeneration

The wheels are turning… what about using Semax in conditions such as Alzheimer's, Parkinson's, ALS, mild cognitive impairment, etc.?

Why Explore Semax for Neurodegeneration?

- Boosts **BDNF, NGF, GDNF**
- Enhances **neuroplasticity**
- Reduces **neuroinflammation**
- Supports **mitochondrial function & ATP**
- Protects neurons under oxidative stress
- Improves cognitive performance

These mechanisms are relevant across ***all major neurodegenerative diseases***.

ALZHEIMER’S DISEASE

Alzheimer’s: Key Problems

- Low **BDNF** in hippocampus
- Synaptic loss
- Neuroinflammation
- Oxidative stress
- Mitochondrial failure

How Semax Supports Alzheimer’s

Strong **BDNF booster**

Enhances hippocampal plasticity

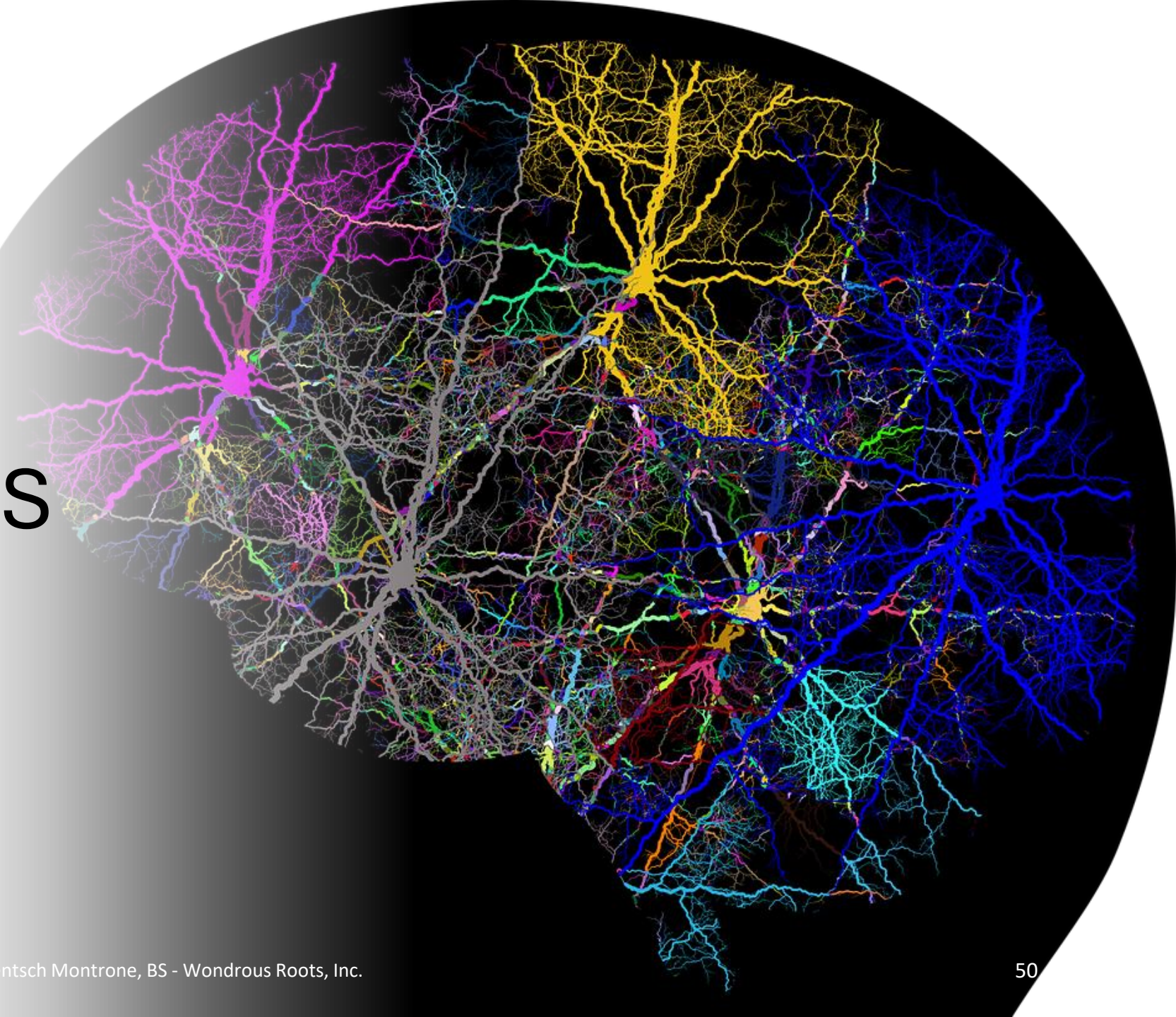
Reduces inflammatory cytokines

Supports mitochondrial function

Improves attention & memory circuits

Not curative—supports resilience, slows decline, improves function.

PARKINSON'S DISEASE



Parkinson's: Key Problems

- Dopaminergic neuron loss
- Low **GDNF**
- Mitochondrial dysfunction
- Cognitive slowing
- Apathy / low motivation

How Semax Supports Parkinson's

Increases **GDNF** (dopamine neuron survival factor!)

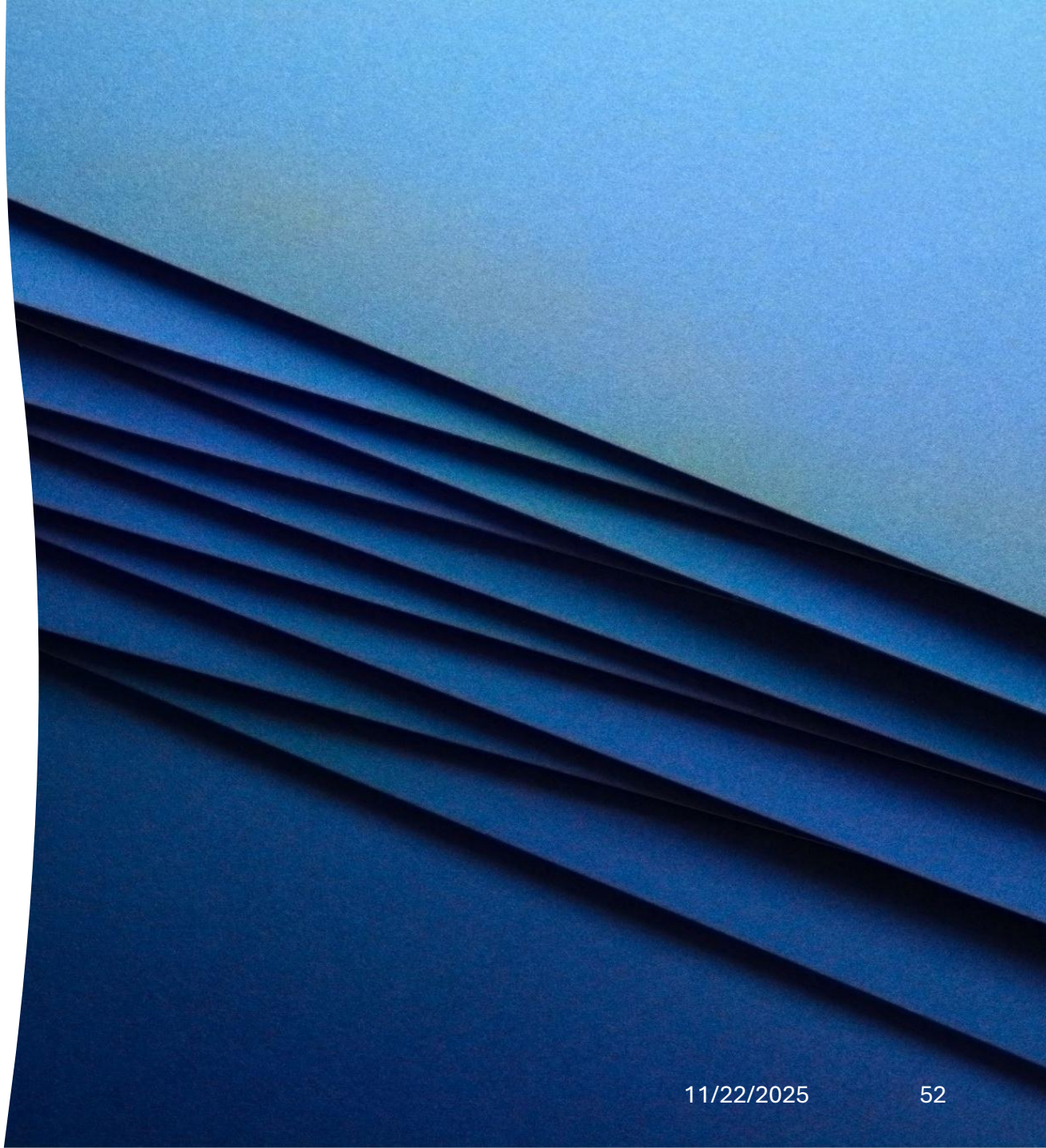
Boosts **BDNF** (motor learning, plasticity)

Improves dopamine tone

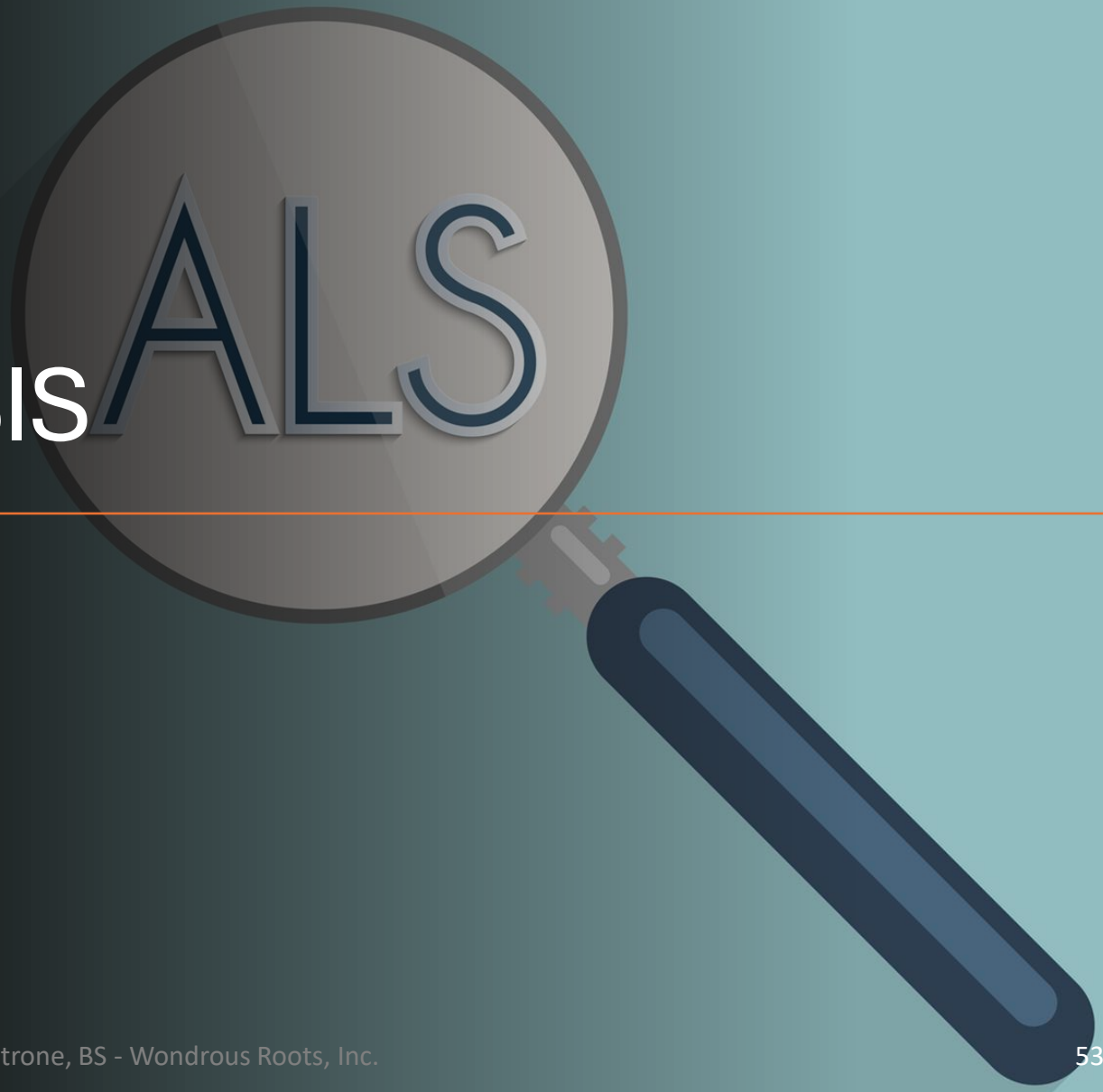
Supports mitochondrial efficiency

Enhances focus, motivation, executive function

Mechanistically aligned with neuroprotective PD support.



AMYOTROPHIC LATERAL SCLEROSIS



ALS: Key Problems

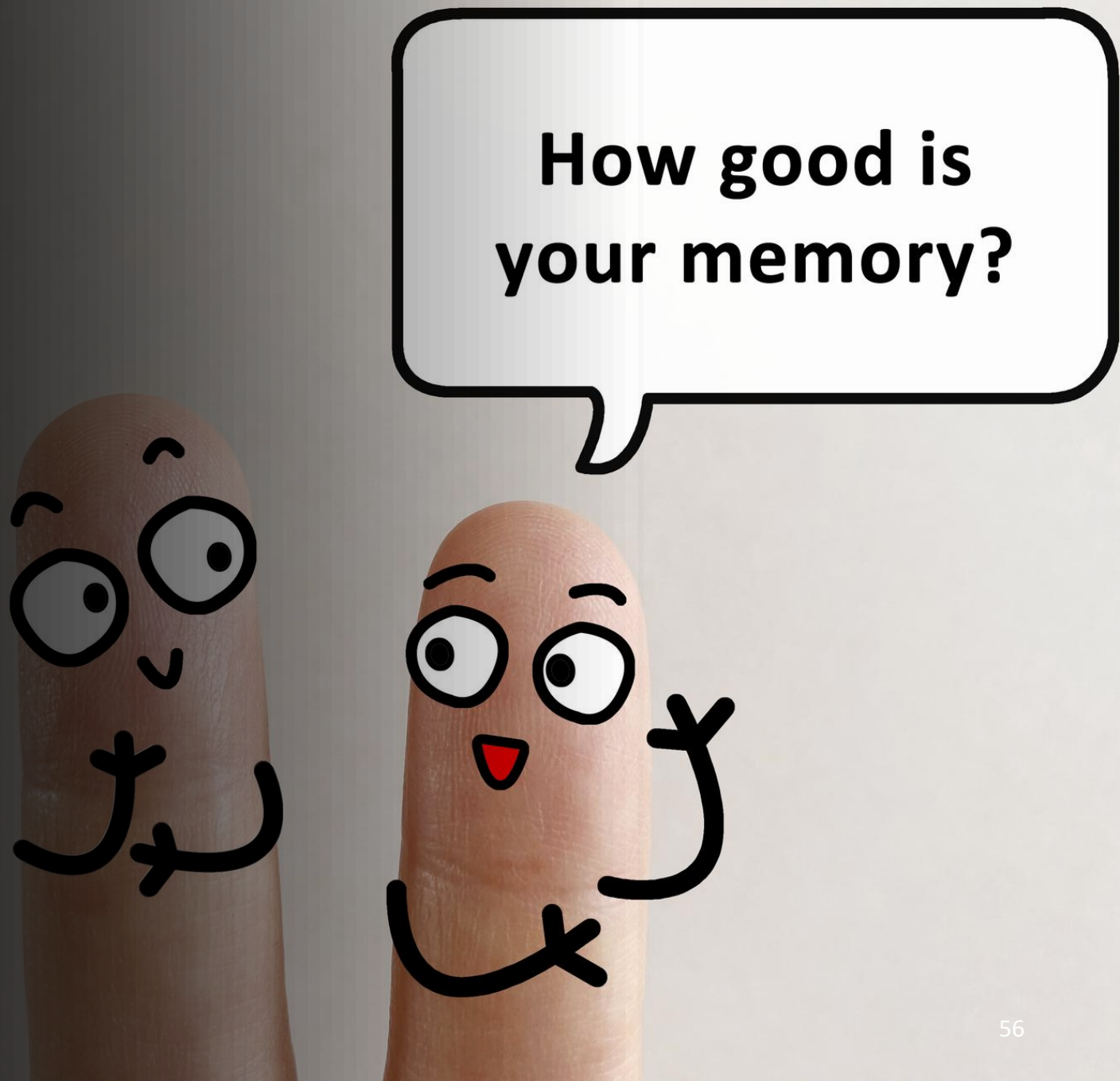
- Rapid motor neuron degeneration
- Severe oxidative stress
- Neuroinflammation
- Mitochondrial collapse

How Semax Could Support ALS

- **BDNF** supports motor neuron survival
- **GDNF** reduces axonal degeneration
- Reduces inflammatory toxicity
- Stabilizes mitochondrial function
- May improve function & slow decline

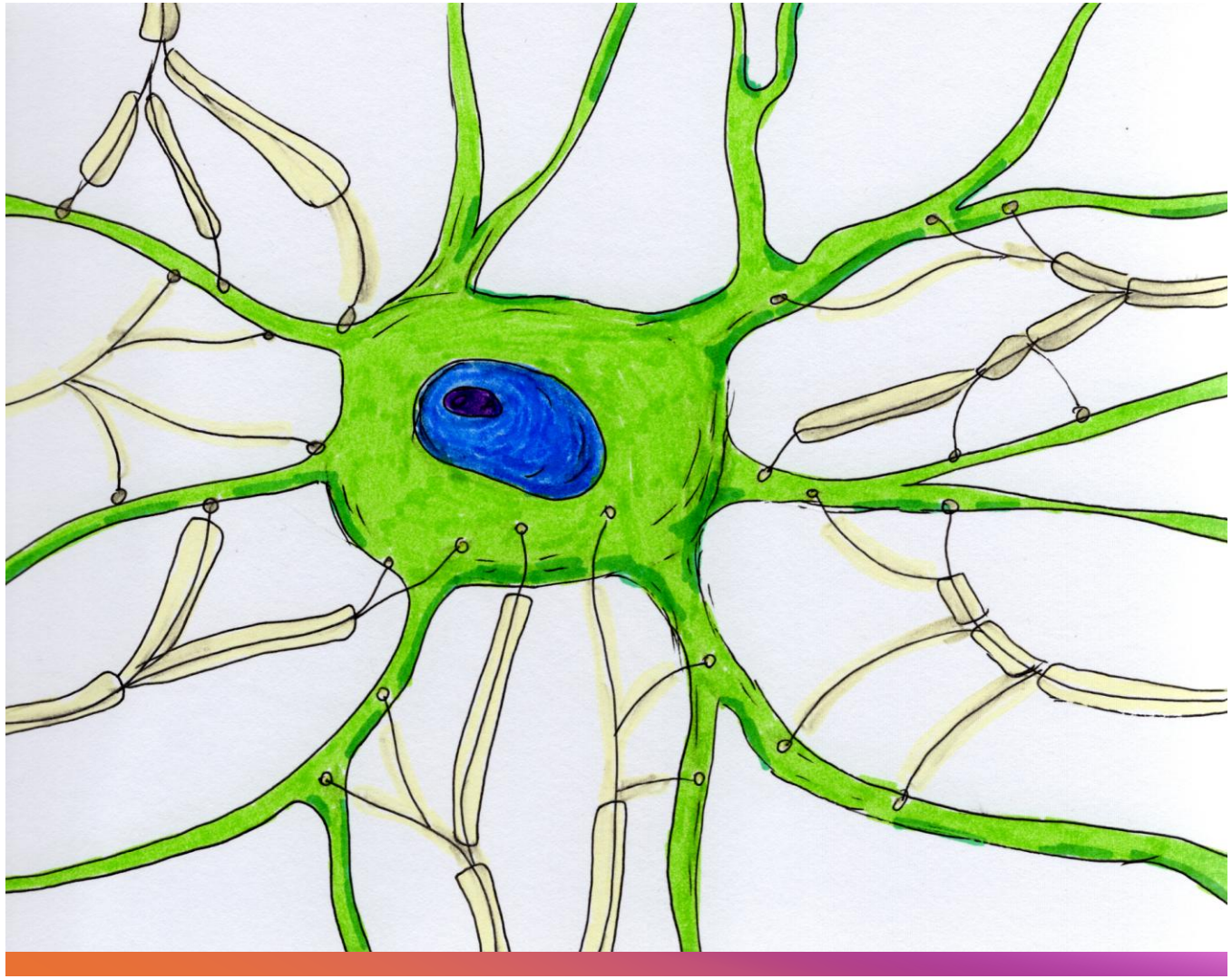
Not a cure — but mechanistically meaningful support.

MILD COGNITIVE IMPAIRMENT



MCI: The “Golden Window”

- Early memory changes
- Slowed processing
- Reduced neuroplasticity
- Mild vascular impairment



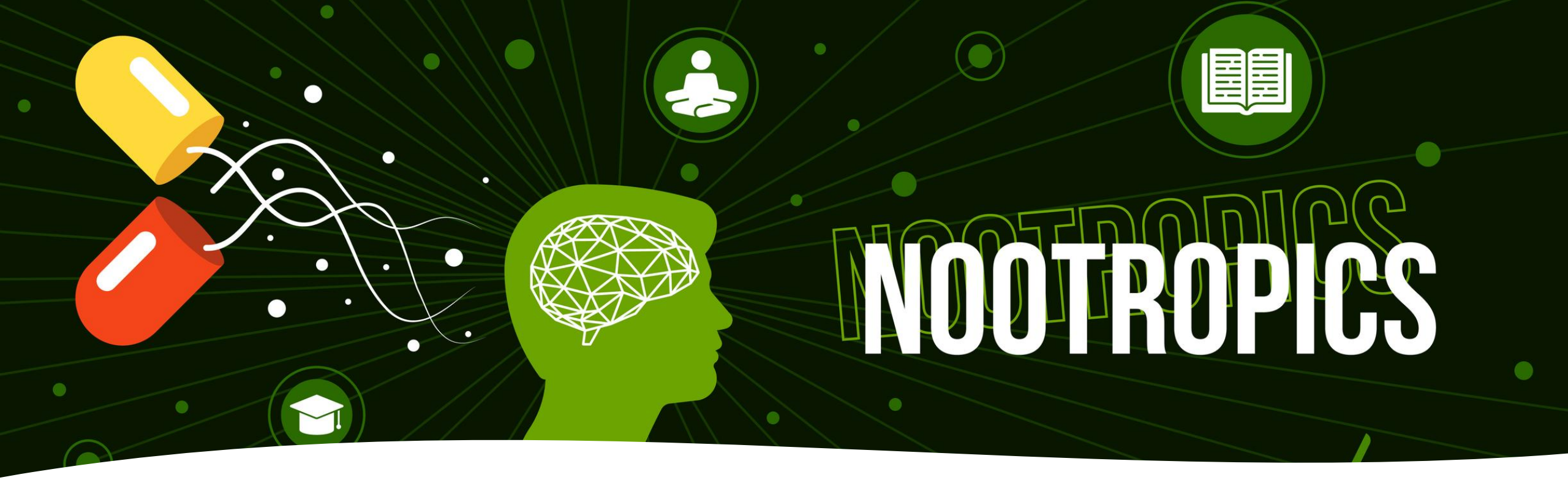
How Semax Helps MCI

- Boosts BDNF → better synaptic signaling
- Improves processing speed
- Reduces neuroinflammation
- Supports brain energy
- Enhances memory & attention
- One of the most promising nootropic supports for early decline.

AGE-RELATED BRAIN DECLINE

Normal Aging: What Declines

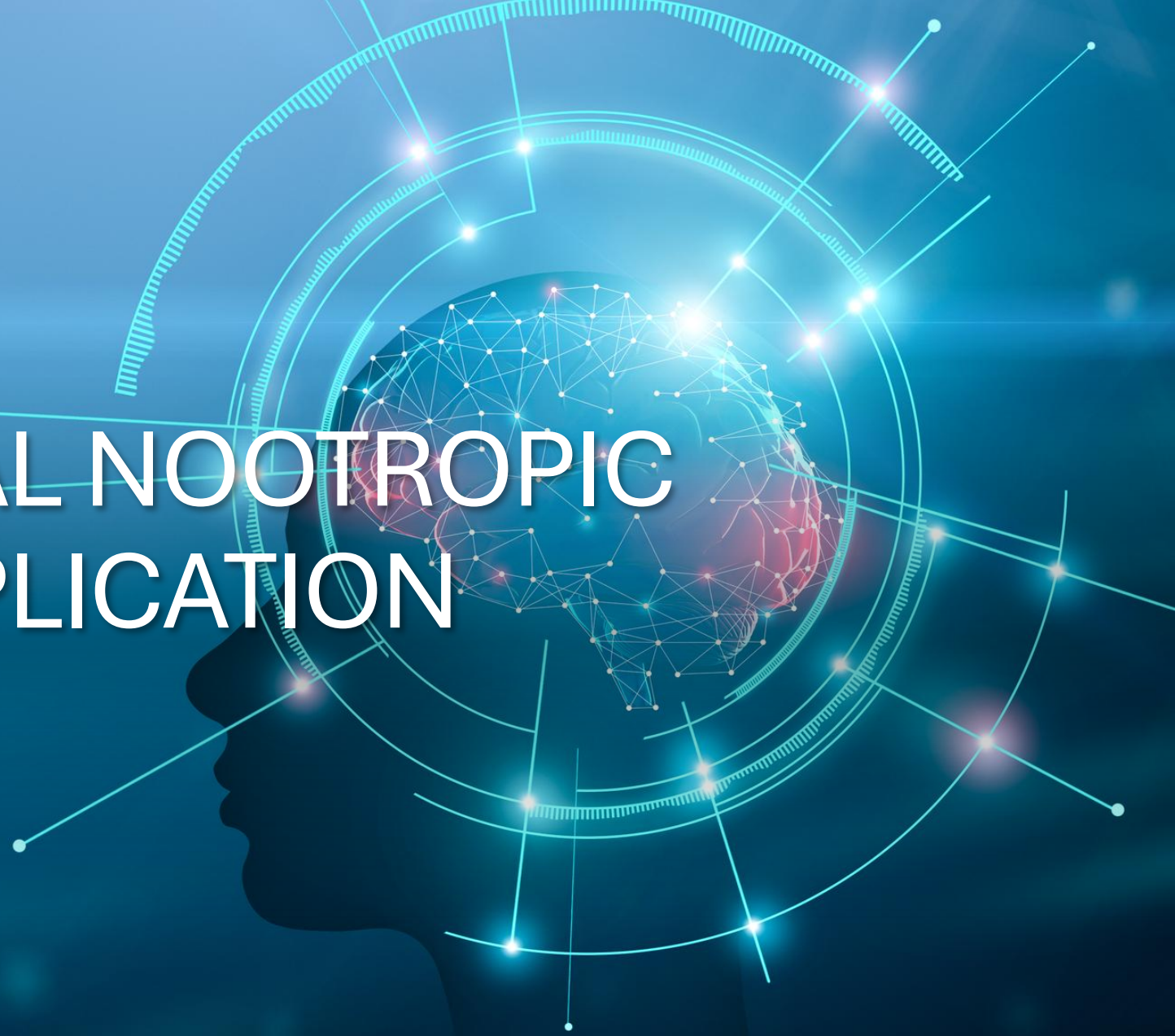
- BDNF drops
- Mitochondria weaken
- Neuroinflammation rises
- Synaptic density falls
- Processing speed slows



Semax as a Neuroprotective Nootropic

- Reverses age-related BDNF drop
- Supports mitochondrial energy
- Enhances cognitive endurance
- Boosts attention & working memory
- Helps maintain neuroplasticity
- Like methylene blue — but via BDNF + neurotrophic pathways.

GENERAL NOOTROPIC APPLICATION



Who Already Uses Semax?

- Students
- Programmers
- High-focus professionals
- Older adults
- People recovering from illness
- Individuals with brain fog

Why It Works as a Nootropic

- Not a stimulant
- Not a sedative
- Enhances *cognitive function*, not just energy
- Boosts neuroplasticity, memory, motivation
- Reduces brain inflammation
- Supports mitochondrial output

⭐ BIG PICTURE SUMMARY

Why Semax Deserves Attention

- Semax/N-acetyl-semax/N-acetyl-semax amidate may help:
- Slow neurodegenerative decline
- Support brain resilience
- Improve memory, focus, mood
- Enhance neuroplasticity
- Strengthen mitochondrial function
- Improve recovery from injury

Not treating disease pathology —
but enhancing the *brain's own repair and resilience mechanisms*.

Wow!

What an exhilarating discovery this has been — not only for those facing serious neurological challenges right now, such as post-stroke, post-concussion, or traumatic brain injury, but for **all of us** who care about preserving, strengthening, and protecting our brains as we age. N-acetyl-semax and its analogs represent a remarkable new addition to the **brain-health toolkit**: a peptide that stands strong on its own yet becomes even more powerful when combined with other nootropic and neuroprotective strategies. Whether paired with glutathione, methylene blue, plasmalogen precursors, or mitochondrial powerhouses like CoQ10, PQQ, NAD, and R-lipoic acid, this therapy opens a new frontier in cognitive support and long-term brain resilience. It's not about treating disease — it's about **elevating the brain's ability to repair, adapt, and thrive**. A truly exciting horizon for us all.

Where People Are Obtaining It

- Peptide sciences / research peptide vendors
- Limitless Life Nootropics – Peptides.org
- NH Nootropics (Amazon)
- Quality Research Chemicals N-Acetyl-Semax Amidate (Amazon)

All labeled for *research use only*

⭐ Very Abbreviated Research-Use Guideline

Typical Use:
1–2 sprays per nostril, 1–2x daily (morning preferred).

Potency Note:
Amidate version = stronger → often lower dose.

Cycle:
5 days on / 2 off OR 10 days on / 10 off.

Tips:
Sniff gently, don’t use right before bed, refrigerate.

Reminder:
Sold as **research peptide only** — not FDA-approved.

Disclaimer

This presentation is for **educational purposes only** and is **not medical advice**.

Semax, N-Acetyl-Semax, and related analogs are **not FDA-approved** and are sold in the United States only as **research peptides**.

Nothing in this webinar is intended to diagnose, treat, cure, or prevent any disease.

Please consult your licensed healthcare provider before making changes to your health plan.