

The Science of Aging Gracefully

The Lifelong Brain

A visual field guide to memory,
neuroplasticity, and the evolving mind.

Week 2 • The Brain at Every Age



Today's Roadmap



Part 1: The Brain Across the Lifespan

Part 2: Memory and Attention

10-Minute Break

Part 3: Neuroplasticity and Lifelong Learning

Part 4: Supporting Brain Health

PART 1

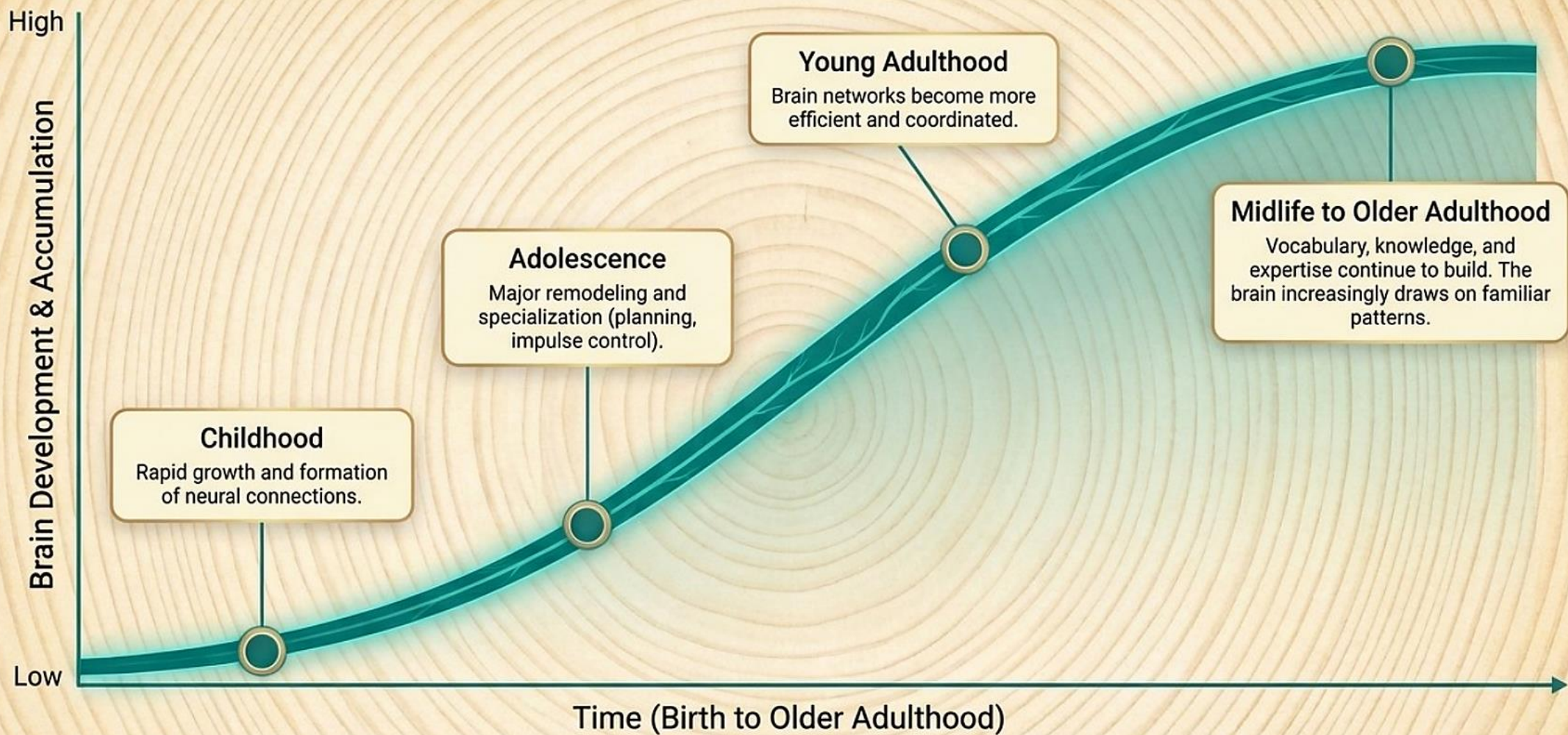
The Brain Across the Lifespan

“Brain development does not stop in childhood”

“Experience strengthens some neural pathways and weakens others”

“Learning, environment, and aging all shape the brain”

“The brain remains dynamic throughout life”



Brain development does not stop in childhood. Learning, environment, and aging shape the dynamic brain throughout life.

From Midlife to Older Adulthood



Knowledge and expertise continue to build

Processing speed may gradually slow

Multitasking may become more difficult

Vocabulary and accumulated knowledge often remain strong

The brain increasingly draws on experience and familiar patterns



Losses

Processing speed may gradually slow.

Multitasking may become more difficult.



Gains

Vocabulary and accumulated knowledge deepen.

Broader perspective and advanced emotional skills.



Stability

Core identity remains intact.

Foundational values and deep relationships.



Adaptation

The brain increasingly draws on experience and familiar patterns.

Strategic use of tools and refined routines.

Speed vs. Experience

Fluid Abilities

Processing new information quickly.

Solving unfamiliar problems
in the moment.

Working with raw speed and active
mental manipulation.

Crystallized Abilities

Vocabulary, extensive knowledge,
and deep expertise.

Life experience and pattern
recognition.

The ability to draw on an accumulated
library of past solutions.

**Different abilities peak at entirely different points
across adulthood. Slower does not mean less capable.**

Processing Speed Changes

Processing speed often slows gradually with age. More time may naturally be needed to respond, learn new technology, switch between tasks, or make decisions.



More time does not mean less understanding. Slower does not mean less capable.

Surprise & Discovery

Reflect on the concepts presented today and identify what stood out to you most.



"One thing that surprised me today..."

A new neuroscience fact

A myth debunked

An unexpected brain habit



Partner Activity: Take 60 seconds to finish this sentence, then share your response with your partner.

Questions?

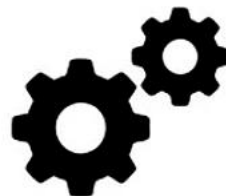
What are you wondering about?

Memory Is Not One Thing



Short-term memory

Holding information briefly in the mind.



Working memory

Holding and using information actively to complete a task.



Long-term memory

Storing information securely over long periods of time.



Procedural memory

Remembering how to do things (riding a bike, playing a piano).

Different forms of memory age differently. What feels like a “bad memory” is often highly specific to just one of these systems.

TRY IT!

 Semantic Memory & Categorization

Category Challenge

Test your rapid memory retrieval and observe how your brain organizes conceptual knowledge.



TIME LIMIT

45 Seconds

Instructions:

Pick one category on the right. Tell as many items as possible to your partner while they keep count before time runs out!



Pair up & get ready!



OPTION A

Animals

Mammals, birds, ocean creatures, farm & wild animals.



OPTION B

Foods

Fruits, vegetables, dishes, snacks & ingredients.



OPTION C

Cities

Local towns, global capitals, historic metropolises.



OPTION D

Kitchen Items

Utensils, cookware, appliances & pantry goods.



Notice: Pay attention to how your brain retrieves items in connected sub-clusters (e.g., grouping farm animals vs. wild animals) during recall.

What Did You Notice?

Your brain probably did not search randomly. It used patterns, categories, and connections.



Turn & Talk

With your partner, discuss:

1

Did your answers come in clusters?

2

Which category felt easiest — and why?

3

What did you do when you got stuck?

1



Clustering

Items often appear in connected groups, not one-by-one.

2



Retrieval cues

One word can unlock a chain of related memories.

3



Practice effect

Repeated recall strengthens access to stored knowledge.



Big Idea

Semantic memory is organized like a web. The more hooks you create, the easier it is to retrieve information.

**Strategy
beats effort.**

Attention Comes Before Memory

We cannot remember information we never fully noticed in the first place.



Did I forget it, or did I never fully notice it? Walking into a room and forgetting why is usually an attention drop, not a memory failure.

“Did I Forget It — Or Never Fully Notice It?”

Walking into
a room and
forgetting
why

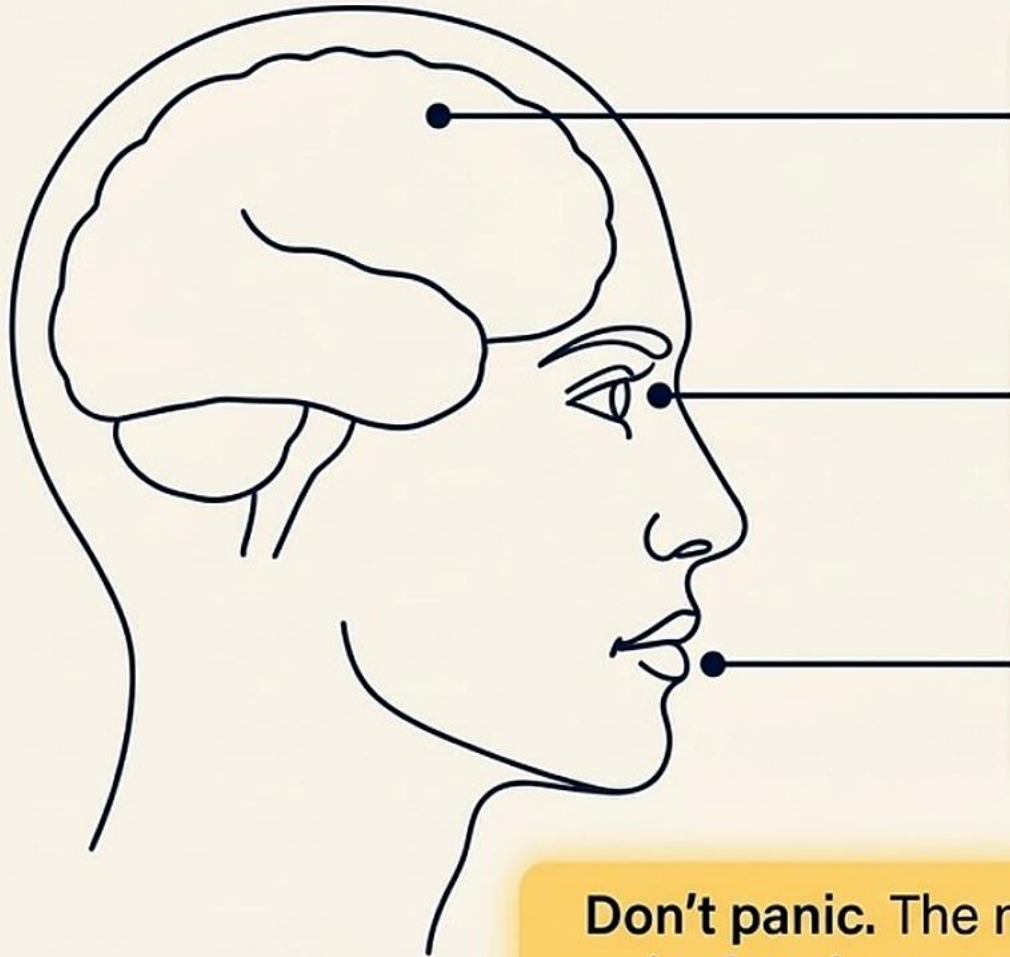
Putting keys
down while
talking

Reading
without
absorbing the
information

Missing part
of a
conversation
while
distracted

Sometimes the problem begins with attention, not memory

Why Are Names So Hard to Remember?



Context

Names often provide zero contextual memory clues (unlike professions or visual traits).

Recognition

A face may feel instantly familiar even when the verbal name is completely missing.

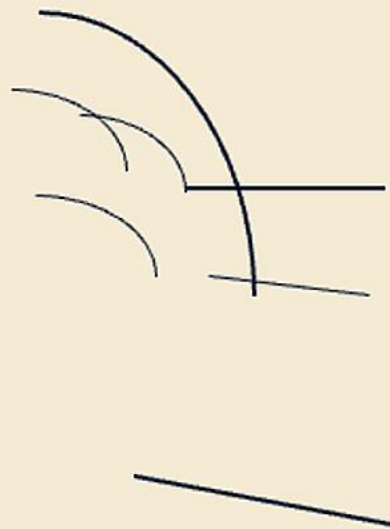
Interference

Stress and 'trying too hard' actively block the brain's retrieval pathways.

Don't panic. The name often returns later when the brain relaxes and the retrieval pathway clears.

6 Ways to Remember Names

Give your brain more than one hook: sound, image, meaning, and context.



A name sticks when it becomes a pattern—not just a sound.

1

Repeat it

Say the name back naturally, then use it once more in conversation.

2

Attach a cue

Link the name to a feature, place, or detail you noticed.

3

Make a scene

Create a vivid mental picture that moves or feels memorable.

4

Be curious

Ask one real question so the person has a story in your mind.

5

Use your phone

Add a quick note: where you met, child's name, or key context.

6

Ask again

When it slips, be honest and re-anchor the name right away.

Try this today: repeat the name, connect it to one cue, and use it again before you leave.

Perspective Shift

Consider how today's discussion reframes your understanding of memory and aging.



"One thing I understand differently now..."

How plastic the brain stays

The value of making errors

Wisdom vs processing speed

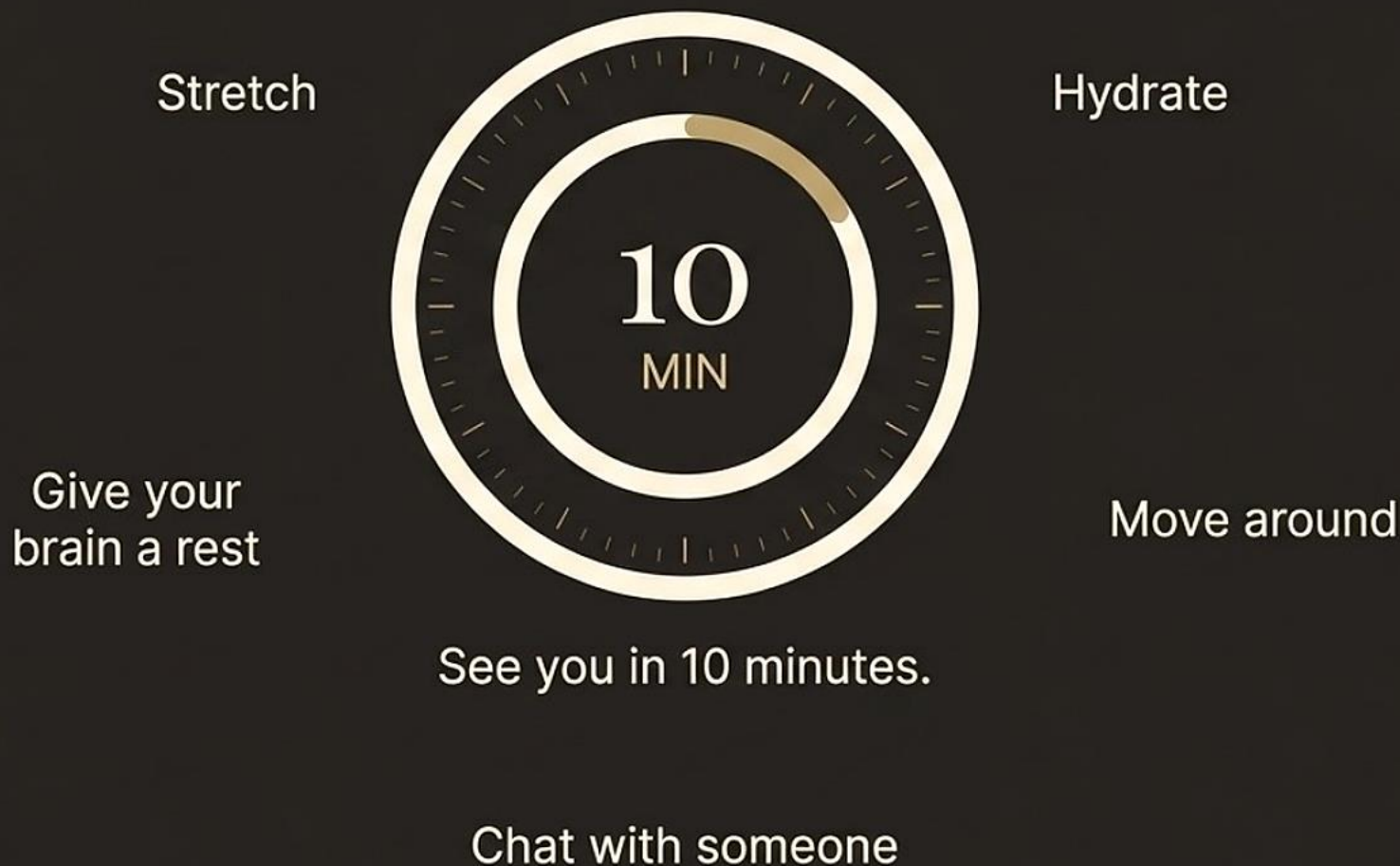


Key Insight: Reframing beliefs about brain health opens up new paths for lifelong learning and growth.

Questions?

What are you wondering about?

10-Minute Break



The Engine of Growth: Neuroplasticity



Learning continues vibrantly throughout life.

Practice and repetition strengthen these new pathways, altering the physical structure of the brain.

New experiences (novelty and manageable challenge) create entirely new neural patterns.

Brain connections strengthen through active use.

The brain can still change.
Neuroplasticity is the brain's inherent ability to physically adapt.

What Helps the Brain Learn?

Seven evidence-based catalysts that stimulate neural growth and deepen retention.



Repetition

Strengthens neural pathways through active recall.



Meaning

Connects new concepts to personal experience.



Novelty

Sparks dopamine and heightens mental focus.



Manageable Challenge

Targets the optimal zone between ease and frustration.



Practice

Transforms effortful deliberate effort into habit.



Social Interaction

Engages collaborative learning and mirror neurons.



Curiosity

Drives self-motivated discovery and deep interest.

SYNERGY

Combining multiple drivers accelerates neuroplastic change.



Core Principle: The brain adapts best when learning feels meaningful, engaging, and appropriately challenging.

Cognitive Strength

Recognize and celebrate the existing strengths and capabilities of your mind.



"One strength I appreciate about my brain..."

Pattern recognition & intuition

Problem-solving under stress

Curiosity & adaptability



Growth Mindset: Acknowledging your cognitive resilience builds confidence to tackle new challenges.

Try It! Learn a New Pattern

Engage your motor cortex and challenge your brain's coordination with this quick sequence.

1



Tap Both Knees

Start with a firm, simultaneous tap on both legs.

2



Clap Once

Bring your hands together in front of your chest.

3



Tap Your Fingers

Quickly touch each fingertip to your thumb.

4



Cross Arms & Tap Shoulders

Cross over your chest to tap opposite shoulders.

5



Repeat the Sequence

Flow through steps 1–4 smoothly in order.

6



Try It Slightly Faster

Increase your pace while keeping control.



Notice: Mistakes are a natural part of learning. Stumbling signals your brain to build and strengthen new neural pathways.

What Just Happened?

A quick breakdown of how your brain adapted, processed, and learned during these activities.



Paid Attention

Filtered distractions to focus deeply on new instructions.



Used Working Memory

Held and retrieved key items and categories in real time.



Coordinated Movement

Engaged motor pathways through physical tapping and gestures.



Made Mistakes

Triggered error signals that alert the brain to adapt.



Corrected Them

Adjusted rhythm and execution through real-time feedback.



Improved via Repetition

Strengthened neural circuits with practice and flow.



Neuroscience Takeaway: Struggle, errors, and adjustments are not signs of failure—they are the exact physical signals your brain uses to grow and rewire.

What Helps the Brain Learn?

Seven evidence-based catalysts that stimulate neural growth and deepen retention.



Repetition

Strengthens neural pathways through active recall.



Meaning

Connects new concepts to personal experience.



Novelty

Sparks dopamine and heightens mental focus.



Manageable Challenge

Targets the optimal zone between ease and frustration.



Practice

Transforms deliberate effort into automatic habit.



Social Interaction

Engages collaborative learning and mirror neurons.



Curiosity

Drives self-motivated discovery and deep interest.



SYNERGY

Combining multiple drivers accelerates neuroplastic change.



Core Principle: The brain adapts best when learning feels meaningful, engaging, and appropriately challenging.



Remember These 8 Items

Study the list for 30 seconds. Look away and test how many items you can accurately recall.



Apple



Chair



River



Candle



Bicycle



Soup



Window



Dog



Memory Tip: Weave these items into a vivid, funny story (e.g., an *apple* sitting on a *chair* floating down a *river*...) to anchor them deeper in long-term memory.

Give Your Brain a Strategy

Use memory hooks that make the list easier to organize, picture, and retrieve.

1 Create a story

Connect the items in a quick, memorable sequence.

2 Visualize the objects

Make each object vivid, colorful, or exaggerated.

3 Group them together

Sort related items so your brain has fewer pieces to hold.

4 Place them around home

Imagine each item in a familiar spot or room.

5 Use rhythm or humor

Add a silly phrase, beat, or joke to make it stick.

6 Recall all eight

Pause, mentally walk through the strategy, then retrieve the list.

Strategies work because they give memory more than one pathway back.

Memory Supports Are Smart

Tools reduce mental load, build consistency, and help protect independence.

1 Calendars

Keep dates, appointments, and commitments visible.

2 Written lists

Capture tasks before your brain has to hold them.

3 Phone reminders

Use alerts for moments when timing matters.

4 Pill organizers

Make medication routines clear and reliable.

5 Routines

Let repetition do some of the remembering.

6 Consistent places

Keep keys and glasses in the same home base.

7 Ask for repeats

Request information again when you need another pass.

8 Protect independence

Supports help people stay confident and capable.

Memory support is not a weakness — it is a smart strategy for everyday life.

Normal Aging vs. Something to Notice

Some memory changes are common. Others are worth naming and discussing.

Common changes

- Occasionally forgetting a name
- Taking longer to learn something new
- Misplacing something and finding it later

These can be frustrating, but they often reflect slower retrieval — not a loss of ability.

Worth discussing

- Getting lost in familiar places
- Repeating the same questions frequently
- Difficulty managing familiar tasks
- Significant changes in judgment or daily functioning

When changes affect safety, independence, or daily life, bring them to a healthcare provider.

The goal is not to worry — it is to notice patterns and get support early.

Supporting the Brain: Biological Care

Healthy habits don't stop aging, but they optimize how well your brain networks function.



Move your body.

Drives blood flow, supports heart health, and directly nourishes brain networks.



Nourish well.

Provides the specific nutrients your cells need to function and repair damage.



Get quality sleep.

Essential for consolidating memories and helping the brain clear out cellular waste.



Manage stress.

Protects the brain from cortisol overload, which aids in attention and memory retrieval.

Action Commitment

Select one specific habit to support your brain's ongoing vitality and growth.



"One thing I want to do to support my brain..."

Try a novel skill or hobby

Increase daily physical activity

Engage in deeper social connection



Daily Habit: Stating or writing down a concrete action triples the likelihood of long-term follow-through.

The Big Takeaway

Key principles of lifelong brain resilience, continuous growth, and cognitive vitality.



Lifelong Plasticity

The brain adapts and restructures throughout every stage of life.



Reframing Aging

Aging is dynamic restructuring, not simple unavoidable decline.



Cognitive Balance

Processing speed slows while wisdom and synthesis remain strong.



Power of Experience

Accumulated knowledge enriches complex neural pathways.



Enduring Growth

Neuroplasticity operates actively across all adulthood decades.



Holistic Pillars

Movement, active learning, social connection, and physical health.



Core Insight: Cognitive vitality is actively sustained through daily habits, continuous learning, and meaningful social engagement.



Biological Care

(Movement,
quality sleep,
and managing
stress)



Strategic Adaptation

(Using tools,
routines, and
relying on
crystallized
expertise)



Lifelong Learning

(Novelty,
neuroplasticity,
and social
connection)



**The
Experience
of a
Resilient,
Graceful
Brain**



Questions?

What are you wondering about?

Week 3: Bones, Muscles, and Movements

Exploring physical aging, functional resilience, and mobility adaptation strategies.



Core Focus

Supporting physical longevity & functional independence.



Physical Aging & Resilience

Understanding systemic physical shifts and factors that promote vitality.



Muscular & Skeletal Changes

Key structural alterations in bone density and muscle mass over time.



Exercise, Nutrition & Rest

The foundational triad for maintaining tissue health and recovery.



Fall Prevention & Mobility

Proactive safety strategies, balance training, and environmental tweaks.



Debunking "Use It or Lose It"

Separating evidence-based practice from common physical activity myths.