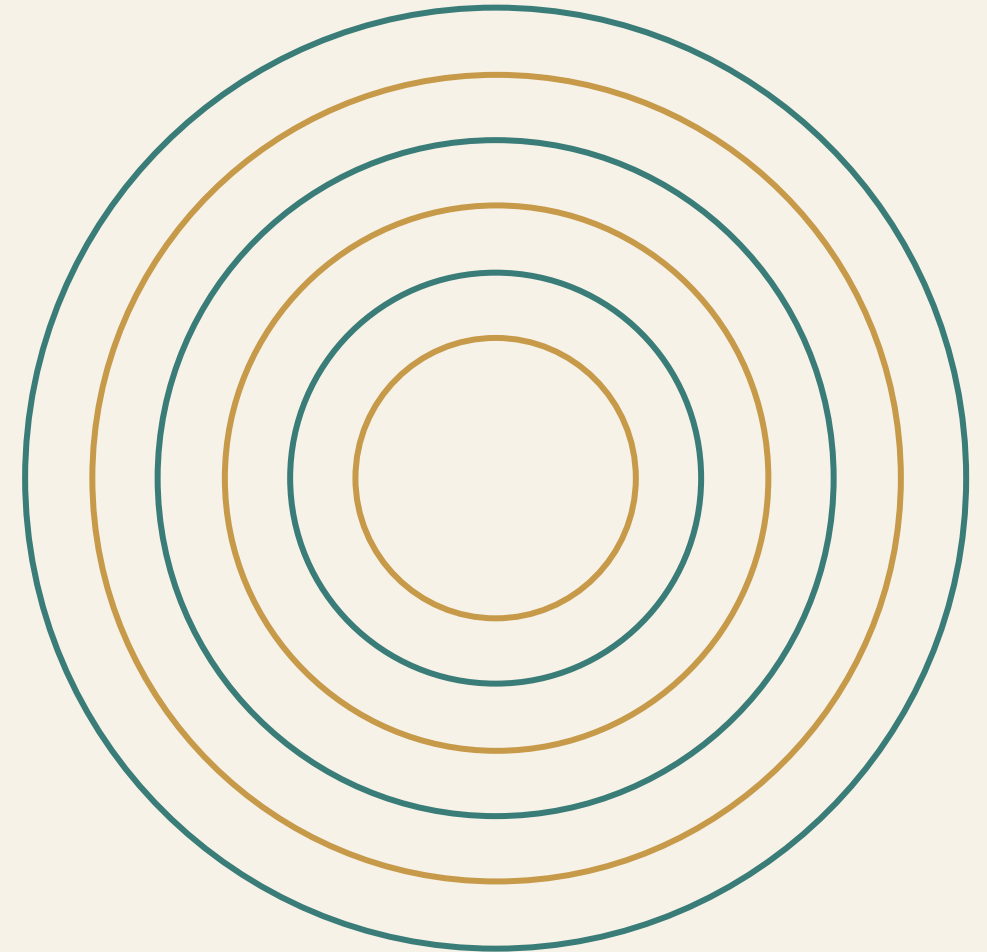


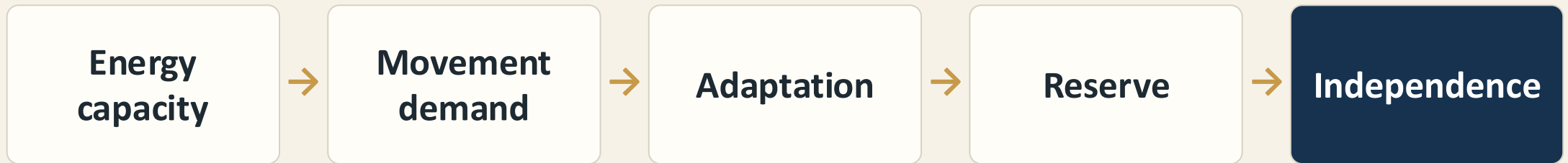
Activity: Building and Preserving Capacity

Movement, strength, balance, endurance, brain health, and independence



Golnosh Sharafsaleh, MD, MS, MBA, DipABLM, FAAFP, AGSF, CPE

From energy to activity



Today's learning goals

Separate everyday activity from structured exercise

Explain how sedentary living and frailty reduce reserve

Recognize gait, strength, balance, and endurance as functional health measures

Build a sustainable return-to-movement plan that begins at current capacity

“

Activity is the ability to move through the world.

The goal is function in daily life.

Activity is larger than exercise

Movement shapes how the body functions throughout the day

Exercise and activity

Structured exercise

Planned sessions that target fitness or performance

Everyday activity

Walking, carrying, reaching, standing, stairs, and floor transitions

Functional capacity

What the body can do when life requires it

“

Function often tells us what laboratory numbers cannot.

A person can have reassuring results and still be losing independence.

What does function look like?

Transitions

Rising from a chair or the floor

Mobility

Walking across a parking lot or through a store

Daily demands

Carrying groceries or climbing stairs

Participation

Traveling, caregiving, playing, and socializing

The major components of capacity

Strength

Generate force

Power

Generate force quickly

Balance

Remain stable during change

Mobility

Move through space

Endurance

Sustain effort over time

Confidence

Trust the body enough to participate

The sedentary trap

Modern life removes the movement that once occurred automatically

“

The body adapts to what it does most often.

When stillness becomes the default, capacity begins to shrink.

Modern convenience removes movement

Chairs

Replace squatting and floor transitions

Cars

Replace routine walking

Elevators

Replace climbing

Screens

Replace physical tasks and position changes

“

Squatting, carrying, and rising from the floor are human skills.

They do not belong only to athletes.

NEAT: movement outside exercise

At home

Standing, cooking, cleaning, gardening

In transit

Walking, stairs, carrying

During work

Position changes, brief movement, active tasks

Why it matters

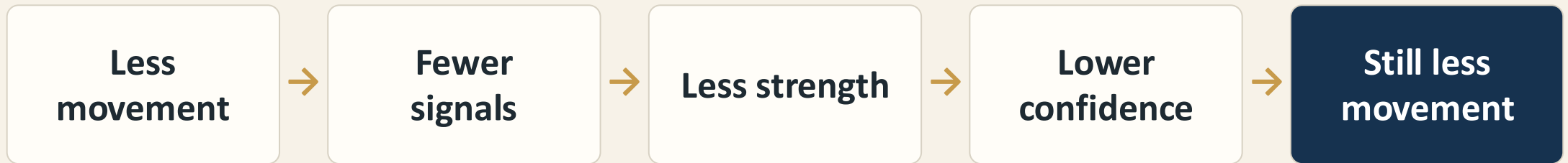
Frequent muscle and balance signals accumulate across the day

“

One workout does not erase an otherwise motionless day.

Exercise and sedentary time are related but distinct exposures.

How disuse reduces capacity



“

This is an environmental mismatch, not a moral failure.

The solution starts with redesigning the day, not blaming the person.

Frailty and the loss of buffer

Reserve determines how the body responds when life becomes difficult

“

Frailty matters more than a birthday.

A robust ninety-year-old and a frail sixty-five-year-old may recover very differently.

Frailty lives on a spectrum

Robust

High reserve and reliable recovery

Pre-frail

Early slowing, fatigue, weakness, or longer recovery

Frail

Small stressors can trigger major functional decline

What frailty can look like

Walking more slowly

Reduced strength or difficulty rising

Low activity and shrinking routines

Persistent exhaustion or prolonged recovery

Unintentional weight loss or declining nutrition

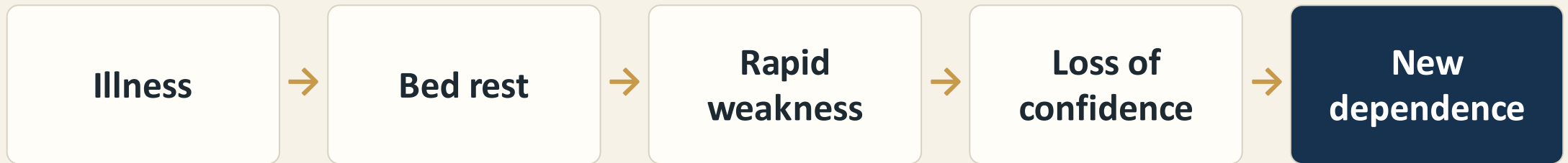
Imbalance and greater vulnerability to stress

“

Frailty becomes visible when the scaffolding disappears.

Illness, surgery, hospitalization, or a fall may reveal decline already underway.

Hospitalization as an inflection point



“

Frailty is a signal for action.

Pre-frailty and some established frailty can improve.

Gait as a vital sign

Walking integrates the brain, muscles, balance, circulation, and confidence

What gait reflects

Brain

Attention, planning, and coordination

Muscle

Strength, power, and propulsion

Balance

Vision, vestibular input, and proprioception

Heart and lungs

Oxygen delivery under demand

Energy

Capacity to sustain motion

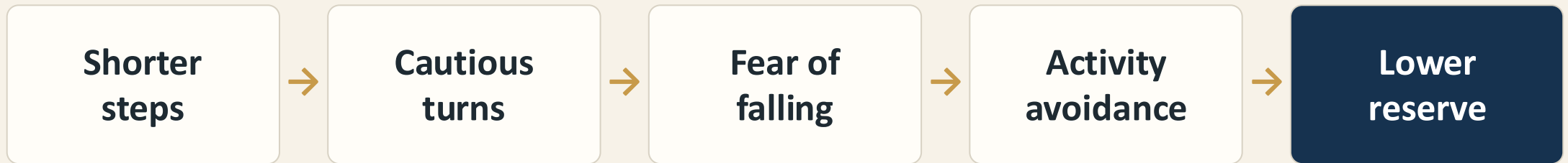
Emotion

Pain, fear, and confidence

Mrs. R was walking differently

The chart looked stable. Her movement told another story.

The clues behind slower walking



“

Fear of falling often appears before the first fall.

A cautious gait may be protective and still deserve attention.

What physical therapy uncovered

Strength

Weak hip stabilizers

Balance

Slower protective reactions

Confidence

Avoidance had reinforced fear

Response

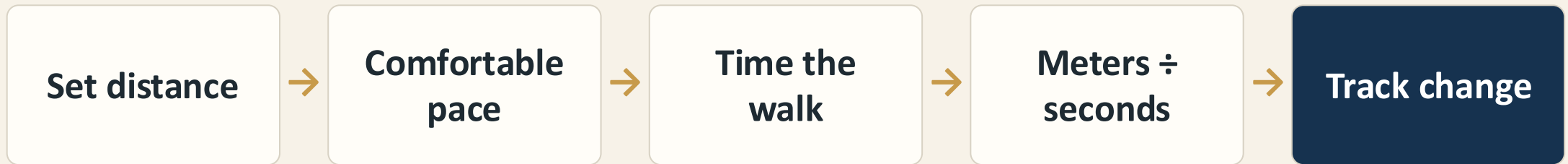
Targeted practice improved walking and participation

“

Change over time often matters more than one gait-speed number.

The trend tells the story.

Measuring gait speed



Pause and reset

Stand, hydrate, or step out as needed

Muscle: the organ of independence

Strength protects movement, metabolism, bone, and recovery

Sarcopenia affects more than appearance

Function

Rising, climbing, carrying, and walking become harder

Metabolism

Less muscle reduces glucose disposal

Stability

Lower strength and power increase fall risk

Recovery

Illness and hospitalization consume a smaller reserve

Mass, strength, and power

Muscle mass

How much tissue is present

Strength

How much force it can generate

Power

How quickly it can generate that force

“

**Power often determines whether a stumble
becomes a fall.**

The body needs force quickly, not eventually.

Muscle supports the whole system

Glucose

Active muscle clears and stores fuel

Bone

Loading stimulates bone and protects the skeleton

Joints

Strength improves support and mechanics

Brain

Movement provides sensory and cognitive input

Principles of strength training

Use resistance that challenges the muscle safely

Train major movement patterns, including pushing, pulling, carrying, squatting, and hinging

Progress gradually as the body adapts

Allow recovery while maintaining consistency

Modify for pain, injury, osteoporosis, cardiovascular disease, or other limitations

“

Strength training must become more important with age.

Aging increases the need for the signal that preserves muscle.

Balance, joints, and pain

Movement often stops because the body no longer feels safe

Balance integrates several systems

Vision

Where the body is relative to the environment

Inner ear

Head motion and orientation

Proprioception

Where joints and feet are in space

Strength and reaction

The ability to correct quickly

Cognition

Attention and movement planning

Confidence

Willingness to attempt the movement

“

Avoiding balance challenges can make balance worse.

The nervous system needs safe practice and feedback.

Pain and imaging tell different parts of the story

Structure

Arthritis and tissue change may contribute

Support

Weakness and reduced range can amplify pain

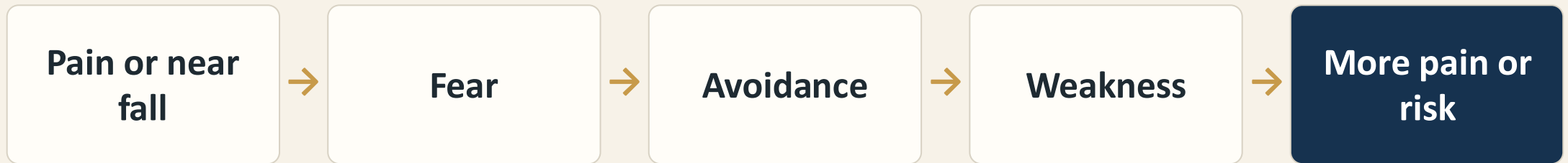
Nervous system

Fear and guarding alter movement

Safety

Sharp, worsening, traumatic, or systemic pain needs assessment

The pain and fear cycle



Mrs. T stopped when she felt better

Physical therapy worked. The maintenance signal disappeared.

“

Confidence returns through repeated safe experiences.

The body learns trust through movement, not reassurance alone.

Endurance sustains participation

Strength starts movement. Endurance keeps it going.

“

Endurance means having something left for the rest of the day.

It is daily capacity, not marathon performance.

What endurance supports

Daily tasks

Finish shopping, cooking, or household work

Recovery

Tolerate illness, travel, or a demanding week

Connection

Keep enough energy for relationships and purpose

Cognition

Support cerebral blood flow and mental stamina

Mr. H had a margin of safety

His walking routine did not prevent pneumonia. It supported recovery.

Sustainable endurance options

Walking

Adaptable and widely accessible

Cycling

Cardiovascular demand with lower joint impact

Swimming or water exercise

Whole-body work with buoyancy

Other choices

Dancing, hiking, rowing, or active daily tasks

“

Ten minutes done regularly can matter more than an exhausting burst.

Duration and consistency come before intensity.

Moderate intensity without a device

Breathing

Faster but controlled

Talk test

Full sentences remain possible, but singing is difficult

Effort

Sustainable rather than punishing

Caution

Symptoms, medications, and health conditions can change the response

The weekly activity guideline

Adults generally aim for at least 150 minutes of moderate aerobic activity each week

Muscle strengthening is recommended on at least two days

Older adults should include balance activity

People with limitations should be as active as their abilities and conditions allow

Benefits begin below the full target; activity can accumulate in smaller segments

“

The guideline is a destination, not the starting line.

Current capacity should determine the first step.

Movement and the brain

Mobility and cognition share blood flow, metabolism, coordination, and engagement

How movement supports the brain

Blood flow

Improves vascular responsiveness and oxygen delivery

Metabolism

Supports insulin sensitivity and cellular energy

Neuroplasticity

Promotes signaling that supports learning and adaptation

Mood and sleep

Reduces avoidable cognitive load

Coordination

Challenges attention and brain-body integration

Connection

Keeps people participating in the world

“

Movement improves the odds. It does not promise prevention.

Brain resilience grows through many pathways, not one guarantee.

“

Mobility preserves identity by preserving participation.

Leaving home, connecting, exploring, and contributing all require movement.

The return to movement

Capacity responds to participation long after people assume it is fixed

A PERSONAL STORY

My own return to movement

Bilateral hip replacement changed how I understand pain, loss, and
regained capacity

“

The body does not require perfection. It requires participation.

Capacity remains responsive to use.

Rebuilding starts in the present

Current baseline

Begin with what is possible now

Small exposure

Choose a dose the body can recover from

Repeated practice

Let consistency create adaptation

Progression

Increase challenge when the current dose becomes tolerable

“

Progress is measured forward, not backward.

The goal is not to recreate a younger body.

A sustainable return-to-movement plan

Reduce long periods of sitting with brief movement

Practice one functional transition, such as chair rises or stairs

Add strength, balance, and endurance at a tolerable dose

Choose activities that fit pain, access, and preference

Track recovery and adjust gradually

Seek physical therapy or medical guidance when safety is uncertain

What do you want movement to protect?

Use the prompts that feel helpful; sharing remains optional

Your Week 4 reflection

Function

Which physical ability matters most to your independence?

Pattern

Where has movement quietly disappeared from your day?

Barrier

Is pain, fear, time, access, or confidence the main obstacle?

First step

What movement can you repeat safely this week?

What to carry forward

Activity includes all movement that preserves daily function

Sedentary environments allow capacity to disappear quietly

Frailty reflects reduced reserve and can often be influenced

Gait, strength, balance, and endurance reveal how systems work together

Movement supports the brain by preserving circulation, adaptation, and participation

Sustainable activity begins at the current baseline and progresses gradually

“

You do not need to reclaim youth. You need to stay engaged.

Next: Longevity and the foundations of Lifestyle Medicine

Reflection: My Relationship with Movement

How do you currently feel about your physical activity level?

What types of movement or exercise do you enjoy most?

What makes movement difficult for you right now?

- ☐ Pain
- ☐ Fatigue
- ☐ Lack of motivation
- ☐ Fear of injury
- ☐ Lack of time
- ☐ Balance concerns
- ☐ Joint problems
- ☐ Shortness of breath
- ☐ Not knowing where to start
- ☐ Stress or burnout
- ☐ Other: _____

Functional Movement Reflection

Activity is not only about workouts.

It is also about what your body allows you to do in everyday life.

Do any of the following feel more difficult than they used to?

- ☐ Climbing stairs
- ☐ Carrying groceries
- ☐ Standing from a chair
- ☐ Walking long distances
- ☐ Getting up from the floor
- ☐ Reaching overhead
- ☐ Maintaining balance
- ☐ Recovering after busy days
- ☐ Keeping up with family or grandchildren

Are there activities you have stopped doing because they feel harder physically?

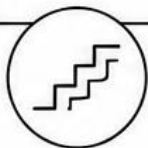
Functional Strength Matters

In geriatrics, we often focus less on appearance
and more on **functional strength**—
the strength needed for daily life.



STANDING FROM A CHAIR

Get up and down
safely and
independently.



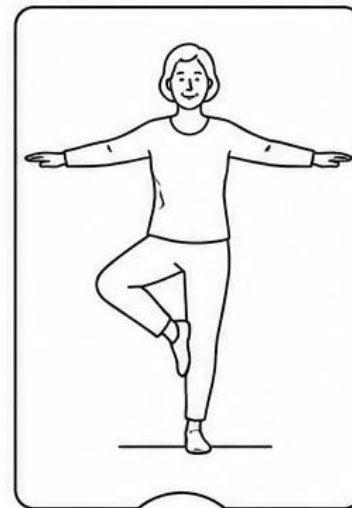
CLIMBING STAIRS

Move up and down
stairs with strength
and confidence.



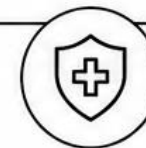
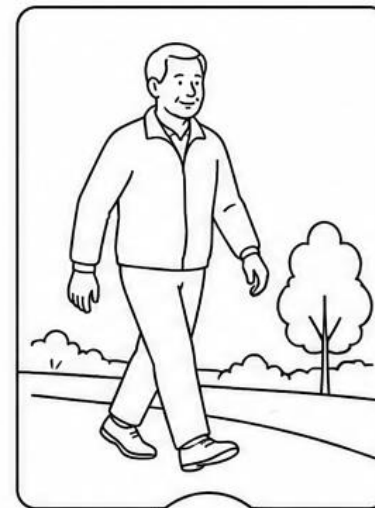
CARRYING OBJECTS

Carry groceries,
bags, or other items
with ease.



MAINTAINING BALANCE

Stay steady on your
feet and reduce the
risk of falls.



RECOVERING AFTER ILLNESS OR INJURY

Bounce back faster
and maintain your
independence.



Functional strength supports independence, resilience, and quality of life.

Small, consistent efforts today help you stay strong for the things that matter most tomorrow.

My Current Activity Baseline

On average, how many days per week do you intentionally move your body?

_____ days/week

How many days per week do you perform strength or resistance exercises?

_____ days/week

How many hours per day do you spend sitting?

_____ hours/day

Do you feel physically stronger, weaker, or about the same compared to 5 years ago?

☐ Stronger

☐ About the same

☐ Weaker

Weekly Movement Goals

Choose 1–3 realistic goals for this week

- ☐ Walk for _____ minutes _____ days/week
- ☐ Practice balance exercises _____ days/week
- ☐ Strength train _____ days/week
- ☐ Stretch or improve mobility _____ days/week
- ☐ Take movement breaks during the day
- ☐ Walk after meals
- ☐ Reduce sedentary time
- ☐ Spend more time outdoors moving

My personal movement goal:

Confidence & Safety Reflection

Do you worry about falling?

- ☐ Frequently
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

Have you fallen within the past year?

- ☐ Yes
- ☐ No

Do you avoid certain activities because you are worried about injury or balance?

Reflection: Looking Ahead

What type of movement brings you the most enjoyment?

What physical ability would you most like to preserve as you age?

What is one realistic movement goal you would like to focus on over the next month?

How might improving your strength, mobility, or endurance improve your quality of life?
