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Performance Longevity

Bridging the Gap Between Healthspan and Lifespan

STEP BY KEISER

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12.4 years

The estimated gap between lifespan and healthspan in the United States.



The gap

Living longer does not necessarily mean living healthier, or maintaining the capacity to do what matters.

The growing gap between lifespan and healthspan is a central concern in healthy aging. While lifespan describes how long we live, healthspan considers how many of those years are lived in good health. In the United States, the estimated gap is 12.4 years. [10]

Physical function is an important part of healthspan. Even when disease is stable or absent, declining strength, power, balance, and endurance can limit independence and participation in everyday life.

Research demonstrates that measures such as gait speed and lower-extremity function are associated with disability, health outcomes, and survival. [1,2]

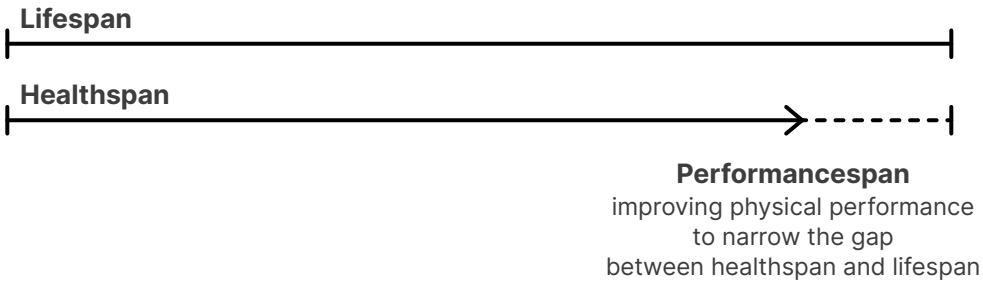
This presents an important opportunity: exercise can contribute to disease prevention and management, while targeted training can develop and preserve physical capacity, supporting both healthy aging and the ability to continue doing what matters. [14]

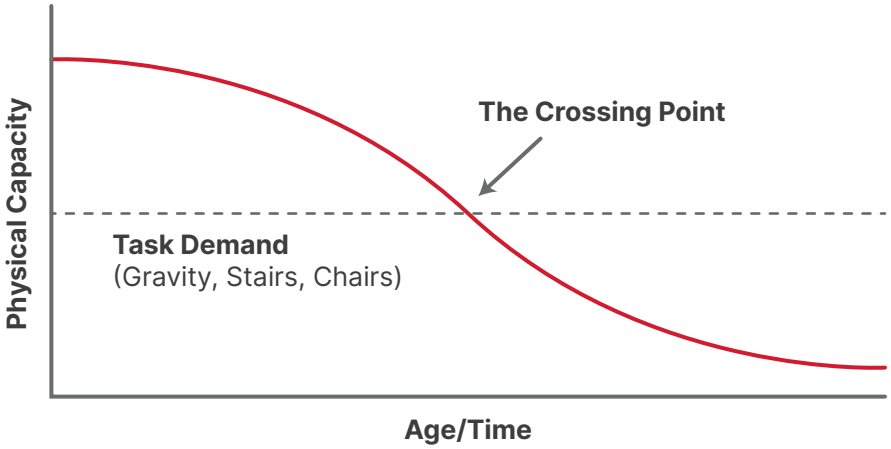
Physical capacity is an important dimension of healthy aging. However, broad measures of healthspan do not always capture whether someone has sufficient capacity to meet the physical demands of everyday life.

Lifespan describes how long we live. Healthspan describes how long we live in relatively good health. Performancespan brings a more specific dimension of healthy aging into focus: how long we retain sufficient physical capacity to meet the demands of the things we need and want to do.

Performance Longevity is the framework for extending performancespan: preserving and developing the capacity to meet the physical demands of daily life over time.

The goal is not to maintain peak performance throughout life. It is to build and preserve enough capability, consistency, and reserve to continue doing what matters for as long as possible.





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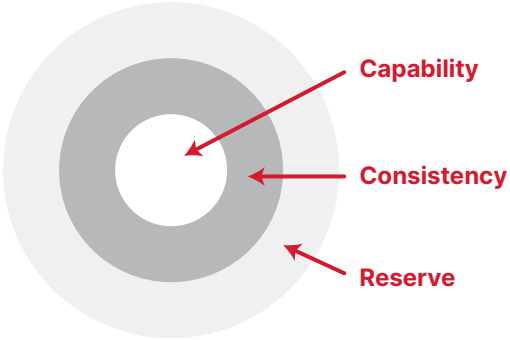
Capacity vs. demand

Every task has a physical demand, and that demand does not change because we age. A chair requires relatively the same amount of force and power to stand at age 90 as it does at age 20. What changes is our capacity to meet that demand. Inactivity, sedentary behavior, illness, or insufficient training can all contribute to declining capacity across the lifespan.

Measures of physical performance can identify these changes in function and predict future disability and mobility outcomes, while targeted exercise can improve physical capacity even in older and frail adults. [2,3,4] This means the margin between capacity and demand can be measured and expanded.

But being able to perform a task once does not tell us whether someone has enough capacity to remain independent. Independence requires enough physical capacity to meet the demands of life, consistently and with something left in reserve.

This gives independence three dimensions: capability, consistency, and reserve. Capability means you can perform the task once. Consistency means you can repeat it throughout the day. Reserve means you have enough capacity beyond the task demand to perform it when you are tired, distracted, carrying something, moving quickly, or responding to the unexpected.



Independence becomes more vulnerable as reserve is lost and the margin between capacity and demand narrows. This happens long before the capability to perform the task is lost.

A person may still climb the stairs but begin using the railing. They may still stand from a chair but use their hands, or complete an outing but need considerably more recovery afterward. The task is still possible, but there may be little or no capacity left in reserve, increasing the risk of falls, injury, or task failure.

The goal of training is therefore not simply to preserve capability. It is to develop enough capacity to support capability, consistency, and reserve.

That gives us a much richer way to think about independence. Instead of simply asking, “Can you still do it?” we also need to ask, “Can you still do it when life is unpredictable?”

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Strength isn’t enough. Independence depends on power, and power fades first.

Power and rapid force production

Muscular power declines faster than strength. That matters because having sufficient strength does not necessarily mean we can develop that force quickly enough, or produce the power required, to meet the demands of everyday life.

Strength describes how much force a person can produce. Power reflects the interaction between force and movement velocity, while rate of force development describes how rapidly force can be generated. Both are important when movements must be performed within a limited time. Research in older adults has shown that lower-extremity muscle power is strongly associated with physical performance, demonstrating that strength alone does not tell the whole story. [5]

This age-related loss of muscle power has recently been described as powerpenia, a term proposed to specifically identify the loss of skeletal muscle power with aging, disease, and/or physical inactivity. [6,11]

These changes reflect not only changes in muscle, but also changes in the nervous system and the ability to recruit and activate muscle rapidly.

A person can therefore retain enough strength to complete a controlled task while losing some of the speed needed for more demanding real-world situations. This can appear as slower movement, difficulty with stairs or rising quickly, or reduced ability to respond when balance is unexpectedly disrupted.

Power and rapid force production are trainable. High-velocity resistance training has been shown to improve muscle power and functional performance in older adults, while progressive resistance training more broadly improves strength and physical function. [6,7]

The lesson is bigger than power itself: different physical qualities contribute differently to our ability to meet the demands of life. Preserving independence requires identifying what capacity is becoming limited and training it appropriately.





Mind and body together

Physical exercise is foundational to both physical and cognitive health.

Exercise is often thought of primarily as a way to preserve strength, mobility, and physical function, but its benefits extend to the brain. Exercise interventions have demonstrated benefits for general cognition, memory, and executive function, including in older adults. [12,13]

Exercise supports cognitive health through physiological adaptations, while movement provides opportunities to engage and challenge cognition in action. Real-world tasks require us to detect information from the environment, decide how to respond, and act with the physical capacity available to us. [8,9]

Training can intentionally challenge this integration. Attention, sensory processing, decision-making, coordination, and response to changing demands can be incorporated into movement while physical capacity is developed.

Exercise provides a foundation for extending performancespan by supporting both physical and cognitive health. From that foundation, training can develop the integration of brain and body required to meet the demands of real life.

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Learn more

Understanding why capacity changes with age is only useful if we know what to do with that information.

Performance Longevity: Bridging the Gap Between Healthspan and Lifespan translates the science of aging, adaptation, and functional decline into a practical framework for working with older adults.

The course examines how aging influences the physical qualities that support independence and connects those changes to what we observe in movement, function, and performance.

Learners develop the decision-making skills to identify what may be limiting capacity, select an appropriate training stimulus, and adapt exercise based on the individual's response.

That process is organized through Keiser AIM: Assessment, Intervention, and Monitoring—assessing current capacity and needs, applying an appropriate intervention, and monitoring response to guide what comes next.

Medical, sensory, neurological, and cognitive considerations are integrated throughout, including scope of practice and collaboration with healthcare providers.

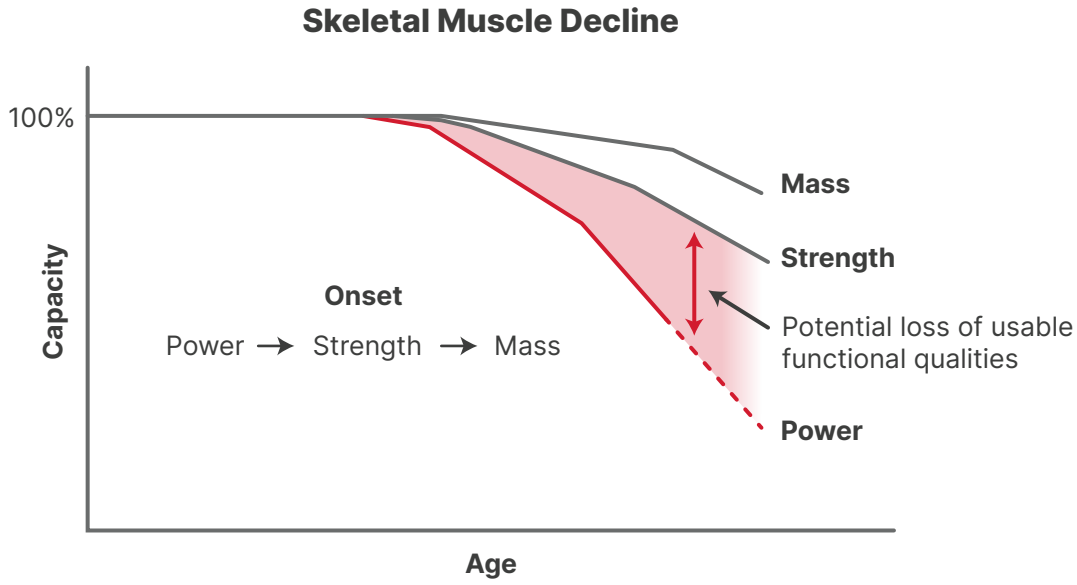
The goal is better decision-making: understanding what you see, knowing what to train, and using response to build capacity and extend performancespan.

KEISER ONLINE COURSE

Performance Longevity:

Bridging the Gap Between Healthspan and Lifespan

ksr.cm/PerformanceLongevity



Apply it

Performance Longevity moves from framework to practice when we apply it to building capacity and extending performancespan.

STEP brings these principles into practice through a structured system for assessing capacity, delivering progressive exercise, monitoring change, and engaging older adults in training designed to support independence.

Keiser equipment supports that application with technology designed to measure performance and deliver precise, progressive resistance across a wide range of abilities.

Together, education, programming, technology, and engagement create a pathway from understanding the science to applying it with purpose.



STEP solves the common challenges that cause other fitness programs to fail.

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