THE ARISING

The Capacity to Keep Going

FITNESS & ENDURANCE



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Fitness, independence, and the life a number should serve

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A hill, a flight of stairs, a walk with someone we love: physical capacity matters because it makes choices possible. A training number becomes useful when it helps us understand those choices. It becomes less useful when it replaces them.

This issue begins with a question that a wearable cannot answer on its own: what do you want to remain able to do? The answer might involve endurance, strength, balance, confidence, or access to a place where movement feels possible. These aims overlap, but they are not interchangeable. A higher estimate of aerobic fitness, the ability to sustain activity using oxygen, does not describe everything a person can do. A lower number does not settle what a person can gain.

Four lines of research help us explore fitness: how abilities change across decades; activity and frailty, when illness or injury becomes harder to recover from; rehabilitation after heart problems; and the LIFE trial of mobility in older adults. Together, they offer a fuller account of fitness without suggesting that one score predicts a person’s future.

General education, not an individualized exercise prescription. People with new symptoms, an unexplained decline, a recent cardiac event or significant limitations need an appropriately assessed plan. Research findings are not medical clearance.

1. Four questions that should stay separate

How do our abilities change as we age? The Swedish SPAF study followed a group of people, called a cohort, from their teens into their sixties. Researchers watched how their abilities changed. They did not assign people to spend their lives exercising or staying inactive, so the study cannot fully separate activity from other influences on health. [1]

Who was less likely to become frail? A review brought together studies that followed people over time. Those who stayed active or became more active were less likely to become frail later. This is a link, not proof that activity caused the whole difference: health and living circumstances can affect both activity and later illness. [2]

Does changing a program help? Randomized trials assign people by chance to different programs, making the groups more comparable. What matters is what the other group did. Comparing combined strength and aerobic training with no exercise asks a different question from adding strength work to an existing aerobic program. [3]

Can a program help people keep walking? LIFE assigned older adults with physical limitations to structured activity or health education. The main result it tracked was whether people lost the ability to walk 400 metres. This makes the trial particularly useful for a discussion about independence. [4]

These studies belong together because they reveal different parts of the problem. They should not be averaged into a universal longevity promise. A cohort can help identify a question; a trial can test a particular intervention; neither automatically tells a reader which plan is suitable today.

2. A second beginning: what LIFE actually tested

The LIFE trial enrolled 1,635 adults aged 70 to 89 who were not physically active, at eight US centers. Participants had physical limitations but could walk 400 metres when the study began. This last detail matters. The trial was not a test in every older adult, nor a trial of restoring walking in people already unable to complete that distance. [4]

Participants were assigned to structured, moderate-intensity physical activity or a health education program. The activity intervention combined center sessions twice weekly with home activity three to four times weekly and included aerobic, resistance and flexibility work. The comparison group attended workshops and did upper-body stretching. The assigned intervention was a supported program, not simply an instruction to exercise more. [4]

Over an average 2.6 years, about 30 in every 100 people in the activity group lost the ability to walk 400 metres, compared with about 36 in every 100 in the education group. The exact results were 246 of 818 people (30.1%) and 290 of 817 (35.5%). That is a difference in an everyday ability, not just a change on a fitness test. [4]

The gap was **5.4 percentage points**: roughly five fewer people out of every 100 in the activity group experienced this loss of mobility. That is what happened in these groups; it is not a promise for an individual.

Researchers also used a calculation that accounts for when people lost mobility. This produced a hazard ratio of 0.82, where 1 would mean no difference. The accompanying 95% confidence interval, 0.69 to 0.98, describes statistical uncertainty around the estimate under the study’s assumptions. It points toward a benefit, but leaves uncertainty about its size. Neither calculation tells us how many extra years someone would live. [4]

Lasting mobility disability was also less frequent: about 15 in 100 people versus about 20 in 100 (14.7% versus 19.8%). The calculation accounting for timing also favored activity: hazard ratio 0.72, with a 95% confidence interval of 0.57 to 0.91. The whole interval was below 1, the no-difference value. These results concern people’s ability to move. The study does not establish that every participant improved, that disability was eliminated, or that each component of the program contributed equally. [4]

Put harms beside benefits

Serious medical problems were reported in about 49 in 100 people in the activity group and 46 in 100 in the education group (49.4% and 45.7%). More were recorded in the activity group, but the result was uncertain: the risk ratio was 1.08, with a 95% confidence interval of 0.98 to 1.20. Because this range includes 1, the data do not clearly establish a difference between groups. They also do not show that exercise caused the problems or prove that the program was risk-free. [4]

The fair reading is that this particular supported program reduced major mobility disability in a defined at-risk population. Its value lies in a meaningful outcome, a randomized comparison and an explicit account of uncertainty. It provides reason to ask what remains possible later in life without promising that support, access or clinical assessment are optional.

3. Read a fitness number in its own language

Aerobic capacity is the ability to supply and use oxygen during sustained activity. Muscular endurance is the ability to keep repeating an effort, and power is the ability to produce force quickly. These describe different abilities. Keep that distinction when looking at a dashboard or an exercise test. Ask what was measured, how it was obtained and what the measurement was intended to answer.

In the Swedish cohort, aerobic capacity was estimated, muscular endurance involved bench-press repetitions, and power used a jump test. These are different tasks. The cohort's average pattern cannot become a personal expiry date, and a result in one task cannot describe all of a person's strength or mobility. [1]

A useful record has three parts: the number, the conditions and the purpose. Were the method and setting comparable? Was the person recovering from illness or returning after a break? Does the measure address the activity that actually matters to them? These are interpretation questions, not a claim that any one contextual factor explains a change.

For wearable-specific measurement methods and their limitations, read the separate Wearables issue. For changes in the timing between heartbeats and what they may mean for recovery, use the HRV issue. Here, the important boundary is between a measurement and a decision: a display may prompt a question, but it does not independently diagnose a problem or authorize a training load.

A fictional example makes the distinction concrete. A reader wants to enjoy an outing with a friend. Their dashboard is unchanged, but they report that the same comfortable route feels easier and they need fewer pauses. Those observations are worth discussing without claiming that they prove reduced disease risk. Another reader sees an improving score but develops concerning symptoms. The score should not be used to dismiss the symptoms. Neither example is a clinical case or a prediction from the studies in this issue.

4. Better than what?

Combined aerobic and resistance training can be described as better than usual care, better than aerobic training alone, or better than resistance training alone. Each sentence asks a different question. In the heart-rehabilitation review, combined training improved a measure of how much oxygen the body could use during exercise compared with usual care without exercise. The average difference was 2.20 ml/kg/min: millilitres of oxygen per kilogram of body weight per minute. Compared with aerobic training alone, people doing both types of training walked about 22 metres farther in six minutes (21.98 metres on average). These are different comparisons, not two ways of describing the same gain. [3]

Those two figures should not be placed in a single list without naming their comparators. Nor should the mortality result versus non-exercising usual care be used to claim that adding lifting to an existing aerobic program extends life. The review concerns people with coronary heart disease and rehabilitation interventions; it is not a universal comparison of recreational fitness routines. [3]

Some oxygen-use and strength results combine different kinds of measurements, making them hard to translate into a target for an individual. The clearer comparisons suggest a useful question for a rehabilitation team: could a program that develops both endurance and strength help with the activities that matter to this person? They do not identify one best program for everyone.

5. From evidence to a useful conversation

Start with a function you value. Write down the activity, the reason it matters and what currently gets in the way. Distinguish a physical limitation from a practical barrier such as transport, time, cost, caregiving or access to a suitable place. This is a planning exercise, not a tested treatment protocol.

Then choose a question that the evidence can help answer. Someone returning after a long inactive period might ask how to build a supported, sustainable practice. Someone in cardiac rehabilitation might ask whether the program addresses both aerobic capacity and strength. Someone concerned about decline might ask what should be assessed before choosing a target.

Useful questions for the relevant clinician or rehabilitation professional include:

• What does my current limitation suggest we should assess?

• Which activities fit my condition and current capacity?

• What would count as meaningful progress in function?

• Which symptoms or changes should alter the plan?

• How should the plan adapt during illness, recovery or a change in circumstances?

The studies do not supply a single correct response for every person. The purpose of these questions is to keep decisions connected to the person's actual circumstances rather than to an isolated headline.

Finally, decide what to record and when to review it. A record can include the activity, how it felt, any relevant symptoms, the conditions and a question for the next appointment. There is no need to turn every day into a performance test. The result worth seeking is a practice that remains answerable to life outside the record.

6. A closer look at the research

How Physical Fitness Changed Over 47 Years

People who became active in adulthood also had better physical performance in this observational cohort.

A population curve can tell us something important about aging. It cannot tell a person that the useful part of training is over. A Swedish study following physical capacity across 47 years is most helpful when those two ideas remain separate.

The cohort included 427 people born in 1958, with objective assessments from adolescence into their sixties. Researchers examined estimated aerobic capacity, muscular endurance and power. Those measures describe different capabilities; calling all of them “strength” loses information.

What changed across the decades

Estimated aerobic capacity and muscular endurance peaked between ages 26 and 36 in both sexes. Decline was initially gradual and accelerated with age. The reported overall reduction from peak to age 63 ranged from 30% to 48%, depending on the outcome.

The variation among people also increased substantially. An average trajectory did not become everyone’s trajectory.

Higher activity earlier in life, and becoming active during adulthood, were associated with better performance.

This was an observational study. It did not randomly assign activity patterns, establish the ideal exercise program, or prove that one person could avoid a specified percentage of decline by following a particular routine.

Why the wording matters

A headline saying fitness “starts falling at 35” can be heard as a biological deadline. The study describes different peaks for different measurements and considerable variation among individuals. The useful clinical task is to assess current capacity and what can be developed from there.

Likewise, doing less than you could when younger does not automatically mean you have sarcopenia, a muscle disorder involving low strength, or a disability. Those require their own assessment. Someone can differ from their younger self and still gain meaningful function, confidence and reserve through appropriate training.

What this suggests for healthspan

A better follow-up conversation asks what the person can do, what they hope to keep doing, what limits them, and which measurements can track progress reliably. Endurance, power and aerobic capacity should not be collapsed into one supposedly definitive longevity number.

Everyone in this group came from one country and birth year. People who remained in a study for decades may also differ from those who left. These limits make it harder to assume that everyone else will follow the same pattern, while the long follow-up remains valuable.

This paper appeared in a December 2025 journal issue. Its long follow-up offers a valuable perspective. A long view can encourage earlier attention to capacity without implying that later effort has lost its value.

Sources and evidence

Rise and Fall of Physical Capacity in a General Population: A 47-Year Longitudinal Study December 2025 journal issue. Longitudinal observational cohort. [1]

Becoming More Active Linked to Lower Frailty Risk

A review of long-term observational studies found benefits associated with both sustained and increased activity.

Adults who stayed physically active over the years were less likely to become frail than those who remained inactive. People who became more active also did better. For longevity, that is a useful place to begin: with the capacity to continue participating in life.

Sgouropoulou and colleagues searched for relevant studies and combined findings where the studies could be compared, a process called a systematic review and meta-analysis. Their review in Geriatrics included 10 studies following 111,714 adults living in the community in Europe, Asia and North America. Six

studies contributed to the combined numerical result. This was observational evidence, so it identifies an association rather than proving that exercise caused the difference.

The pattern over years

The researchers looked beyond a single report of how much someone exercised. They compared people who remained active, people whose activity increased, and people who remained inactive. The review examined how activity changed over time and who became frail later.

People who stayed active had a lower risk of later frailty than those who stayed inactive. The estimated relative difference was 44%; for people who became more active, it was 38%. These do **not** mean that 44 or 38 people out of every 100 avoided frailty. How many people this difference represents depends on how common frailty was in the comparison group. The relative figures do not supply a personal forecast.

For readers who want the detailed estimates: the risk ratios were 0.56 (95% confidence interval 0.42-0.76) for staying active and 0.62 (0.57-0.68) for becoming more active. A ratio of 1 would mean no difference. Both ranges fall below 1, but these were observational studies, so even a clear statistical link does not prove cause and effect.

The authors had more confidence in the finding for people who stayed active than in the finding for those who became active: they rated the evidence moderate and low certainty, respectively. Better studies could change these estimates, especially the less-certain one. Results were similar in populations younger and older than 60 at the beginning of follow-up.

Why this matters

Frailty concerns reserve: how well a person can withstand illness, injury or another stress. Its consequences can include disability and loss of independence. An activity pattern that persists through ordinary weeks and years may therefore matter more than an impressive but brief burst of effort.

That is an interpretation of the evidence, not an exercise prescription. The review does not establish a particular routine, intensity or weekly target. Nor can it tell an individual how much their own risk will change.

What remains uncertain

People who stay active may also differ in health, income, diet and access to care. Illness can itself reduce activity, making cause and effect difficult to separate. Pooling studies with different methods adds uncertainty.

The encouraging finding is that the association was not confined to people who had always been active. Rising activity also tracked with lower frailty risk. The next step is to test how real programs help people build and sustain that change-and whether those programs preserve function over the long term.

Primary research links appear in the source list below. Study publication: August 11, 2026. [2]

Adding Strength Training to Cardiac Rehabilitation

A review of randomized trials found improvements in exercise capacity, strength and quality of life.

Heart rehabilitation has long centered on aerobic exercise such as walking or cycling. A systematic review in Sports Medicine-Open asks what happens when resistance training joins it. The answer points toward a broader view of recovery: fitness, strength and the ability to do more in daily life.

Gois and colleagues synthesized randomized controlled trials involving people with coronary heart disease. The trials compared combined aerobic and resistance training with aerobic training alone, resistance training alone, or usual care without exercise. Different comparisons answer different questions and should not be treated as interchangeable.

What improved

Compared with non-exercising usual care, combined training improved peak oxygen consumption, strength measures and health-related quality of life. The reported between-group mean difference in relative peak oxygen consumption was 2.20 milliliters per kilogram per minute. This is a measure of exercise capacity, not a direct measure of years of life gained.

The comparison with aerobic training alone is especially relevant to existing rehabilitation programs. Combined training generally performed better on oxygen uptake, six-minute walking distance, several measures of muscle strength and quality of life. Across the combined studies, the average difference in six-minute walking distance was about 22 meters.

Against resistance training alone, the combined approach also improved peak oxygen consumption. Together, the findings suggest that aerobic and strength work can contribute complementary benefits rather than requiring an either-or choice.

Read the mortality claim carefully

The review reported fewer deaths with combined training than with non-exercising usual care. That comparison does not isolate the effect of adding strength work to an aerobic program. It should not be turned into a claim that a particular lifting routine prevents death or extends an individual's lifespan.

Supervised rehabilitation also differs from attempting a new program alone after a cardiac event. The review cannot settle the safest or most effective mix for every patient.

The useful question

For someone entering cardiac rehabilitation, a practical conversation is whether the program develops both aerobic capacity and strength, and how the team adapts those elements to their condition. Exercise after a heart event belongs within an individualized rehabilitation plan.

The larger longevity idea is straightforward. Recovery is about more than a test result. Walking farther, carrying something comfortably and feeling capable in the world are outcomes worth measuring. Longer follow-up will help show how durable the gains are and which program designs deliver them most safely.

Primary research links appear in the source list below. Study publication: August 3, 2026. [3]

Sources and further reading

[1] Maria Westerståhl, Gustav Jörnåker, Eva Jansson, et al. Rise and Fall of Physical Capacity in a General Population: A 47-Year Longitudinal Study. Journal of cachexia, sarcopenia and muscle. 2025 Dec;16(6):e70134. DOI: 10.1002/jcsm.70134. PMID: 41243424. Read the primary publication record.

[2] Danai Sgouropoulou, Maria-Iosifina Kasdagli, Demosthenes B Panagiotakos, et al. Long-Term Physical Activity Patterns and Risk of Future Frailty: A Systematic Review and Age-Stratified Meta-Analysis. Geriatrics (Basel, Switzerland). 2026 Aug 11;11(4):104. DOI: 10.3390/geriatrics11040104. PMID: 42645008. Read the primary publication record.

[3] Caroline Oliveira Gois, Alana Lalucha de Andrade Guimarães, Lino Sérgio Rocha Conceição, et al. Effect of Combined Aerobic and Resistance Training on Exercise Capacity, Muscle Strength, Quality of Life, and Mortality in Patients with Coronary Heart Disease: A Systematic Review with Meta-analysis. Sports medicine - open. 2026 Aug 03;12(1):112. DOI: 10.1186/s40798-026-01080-3. PMID: 42543470. Read the primary publication record.

[4] Marco Pahor, Jack M Guralnik, Walter T Ambrosius, et al. Effect of structured physical activity on prevention of major mobility disability in older adults: the LIFE study randomized clinical trial. JAMA. 2014 Jun 18;311(23):2387-96. DOI: 10.1001/jama.2014.5616. PMID: 24866862. Read the primary publication record.

Related reading

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