Clinical research and major health organizations outline the following specific, measurable benefits of a regular walking routine:

•**Mortality and Longevity:** As little as 15 minutes of fast walking daily is associated with a nearly 20% reduction in total and cardiovascular mortality.

•**Cardiovascular Health:** Regular walking increases aerobic capacity, helps control hypertension, and reduces the risk of heart disease and stroke.

•**Metabolic and Weight Control:** Walking combats obesity, helps manage weight, and regulates blood sugar by improving insulin sensitivity, which prevents or delays the onset of type 2 diabetes.

•**Neurological and Mental Health:** Walking lowers the risks of cognitive decline and dementia. It relieves symptoms of depression and anxiety by elevating mood, increasing brain-derived neurotrophic factor (BDNF), and lowering cortisol.

•**Musculoskeletal Health:** Walking slows the process of osteoporosis, builds bone and muscle strength, and protects the joints. It is specifically proven to ease joint pain and reduce the incidence of frequent knee pain in older adults with knee osteoarthritis.

GeroScience. 2023 Jul 26;45(6):3211–3239. doi: 10.1007/s11357-023-00873-8

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Daily steps and health outcomes in adults: a systematic review and dose-response meta-analysis

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Summary

Background Despite the rapid increase in evidence from the past decade on daily steps and health-related outcomes, existing systematic reviews primarily focused on few outcomes, such as all-cause mortality. This study synthesised the prospective dose-response relationship between daily steps and health outcomes including all-cause mortality, cardiovascular disease, cancer, type 2 diabetes, cognitive outcomes, mental health outcomes, physical function, and falls.

Methods For this systematic review and meta-analysis, we searched PubMed and EBSCO CINAHL for literature published between Jan 1, 2014, and Feb 14, 2025, supplemented by other search strategies. Eligible prospective studies examined the relationship between device-measured daily steps and health outcomes among adults without restrictions on language or publication type. Pairs of reviewers (BN, KO, ML, and TN) independently did the study selection, data extraction, and risk of bias assessment using the 9-point Newcastle-Ottawa Scale. Hazard ratios (HRs) from individual studies were synthesised using random-effects dose-response meta-analysis where possible. Certainty of evidence was assessed using GRADE. This trial is registered with PROSPERO (CRD42024529706).

Findings 57 studies from 35 cohorts were included in the systematic review and 31 studies from 24 cohorts were included in meta-analyses. For all-cause mortality, cardiovascular disease incidence, dementia, and falls, an inverse non-linear dose-response association was found, with inflection points at around 5000–7000 steps per day. An inverse linear association was found for cardiovascular disease mortality, cancer incidence, cancer mortality, type 2 diabetes incidence, and depressive symptoms. Based on our meta-analyses, compared with 2000 steps per day, 7000 steps

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Study Details

- Systematic literature search done in December 2024, without language restrictions.
- Identified 13 systematic reviews addressing daily steps and health outcomes
- This study examines the prospective dose-response association between daily steps and a wide range of health outcomes, including all-cause mortality, cardiovascular disease incidence and mortality, type 2 diabetes incidence,, cancer incidence and mortality, dementia, depressive symptoms, physical function, and falls.
- Our findings show consistent associations across all these outcomes despite variations in dose-response curves.
- *Notably, a stepping volume of 7000 steps per day is associated with 6–47% lower risks compared with 2000 steps per day across all examined outcomes.*
- *The relationship between cadence (a proxy for stepping rate or intensity) and health outcomes remains less consistent.*

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Overall, we found the evidence too limited to inform stepping rate recommendations. More research is needed to investigate the relationship between various cadence metrics and health outcomes independent of stepping volume, to determine which cadence metrics are the most relevant to public health messaging.

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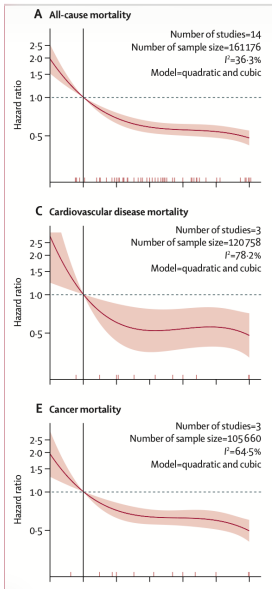

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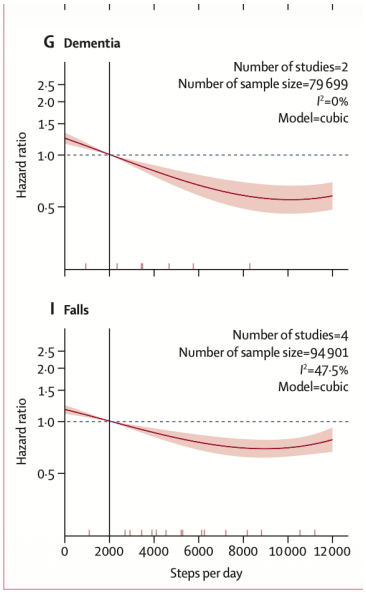

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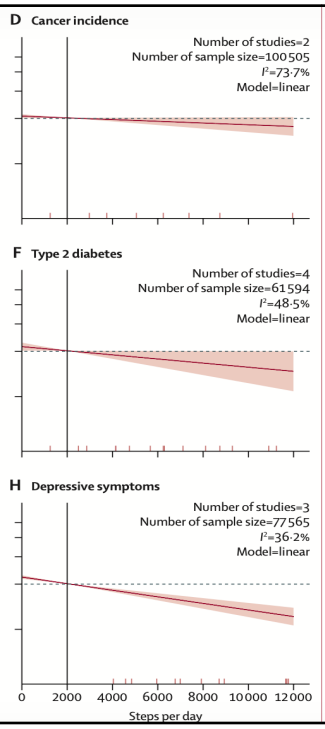

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REVIEW

The multifaceted benefits of walking for healthy aging: from Blue Zones to molecular mechanisms

Zoltan Ungvari · Vince Fazekas-Pongor · Anna Csiszar · Setor K. Kunutsor

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Abstract Physical activity, including walking, has numerous health benefits in older adults, supported by a plethora of observational and interventional studies. Walking decreases the risk or severity of various health outcomes such as cardiovascular and cerebrovascular diseases, type 2 diabetes mellitus, cognitive impairment and dementia, while also improving mental well-being, sleep, and longevity. Dose-response relationships for walking duration and intensity are established for adverse cardiovascular outcomes. Walking's favorable effects on cardiovascular risk physical activity guidelines by walking briskly for 30 min per day for 5 days can reduce the risk of several age-associated diseases. Additionally, low-intensity physical exercise, including walking, exerts anti-aging effects and helps prevent age-related diseases, making it a powerful tool for promoting healthy aging. This is exemplified by the lifestyles of individuals in Blue Zones, regions of the world with the highest concentration of centenarians. Walking and other low-intensity physical activities contribute significantly to the longevity of individuals in these regions, with walking

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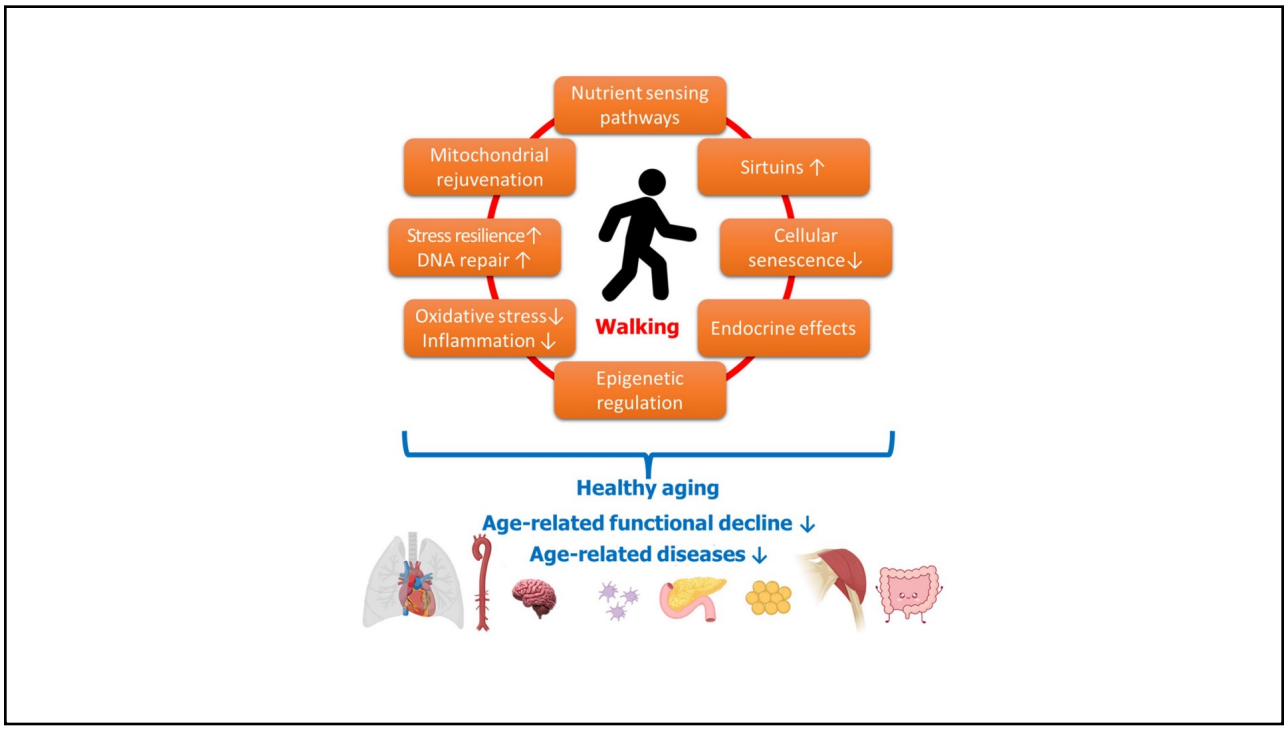
Nutrient sensing pathways
Mitochondrial rejuvenation
Sirtuins ↑
Stress resilience↑ DNA repair ↑
Cellular senescence↓
Oxidative stress↓ Inflammation ↓
Walking
Endocrine effects
Epigenetic regulation
Healthy aging
Age-related functional decline ↓
Age-related diseases ↓

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