



# Gait Speed Reveals Clues to Lifelong Health

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Rasmussen et al<sup>1</sup> present compelling evidence that reduced gait speed in generally healthy adults in their 40s already reflects relatively worse physical and cognitive function and an accelerated rate of aging compared with adults with normal gait speed. Slower gait speed at midlife was also associated with lower early childhood indicators of brain health. On the basis of a unique population of 904 individuals from New Zealand followed up regularly for more than 40 years, since age 3 years, the authors assessed the rate of aging with 2 validated indicators: an independent perception of the rate of facial aging and a physiological index that measures the rate of change in 19 markers of body system health, including body mass index, waist-to-hip ratio, glycated hemoglobin level, leptin level, blood pressure (mean arterial pressure), cardiorespiratory fitness (maximum oxygen consumption), forced expiratory volume in 1 second, ratio of forced expiratory volume in 1 second to forced vital capacity, total cholesterol level, triglyceride level, high-density lipoprotein cholesterol level, ratio of apolipoprotein B100 to apolipoprotein A1, lipoprotein(a) level, creatinine clearance, blood urea nitrogen level, C-reactive protein level, white blood cell count, gum health, and caries-affected tooth surfaces.

Why are these findings important for practice, research, and health policy? First, although gait speed has become a widely accepted indicator of health risk in late life, including risk of hospitalization, disability, dementia, and mortality,<sup>2-5</sup> its application earlier in adulthood is less clear. The study by Rasmussen et al<sup>1</sup> confirms that a subset of persons in their 40s already show indicators of future health challenges and are already aging more quickly than their peers. Furthermore, this study suggests that unknown factors that had already affected 3-year-old children also influenced their health and function 40 years later. As stated by Rasmussen et al, "Gait speed at midlife may be a summary index of lifelong aging with possible origins in childhood central nervous system deficits."<sup>1</sup>

What should we do with this information? Gait speed appears to be a valuable signal of potential health concerns in midlife adults. Could clinicians screen gait speed as part of health checkups for all adults? Although Rasmussen et al<sup>1</sup> do not provide a clear cut point for reduced gait speed, they do suggest that rates of aging, cognition, and brain health are most affected among persons in the lowest quintile of gait speed. For usual gait speed, using the authors' data, I would suggest a cut point of approximately 1.1 meters per second. What could clinicians do for adults identified by this screen? The rate of aging indicator includes multiple potentially actionable physiological indexes, including blood pressure, fitness, markers of obesity, hyperlipidemia, glycated hemoglobin, lung function, and dental health.<sup>1</sup> Could insurers and practitioners include gait speed and these indicators in their preventive health plans starting much earlier, perhaps even in young adults? Certainly, as the authors suggest,<sup>1</sup> midlife adults with slow gait speed are a potential target for interventions to prevent late-life disability and dementia.

What are the implications for early childhood? Although the associations persisted after accounting for childhood socioeconomic status, there are many things we do not know about these children, including their prenatal care, birth weight, childhood illnesses, sensory function, home situations, or environmental risks. The markers of childhood brain health were all performance tests that might have been influenced by other important issues, such as sensory function, anxiety, familiarity with tasks, or how well a child felt on the day of testing. We should not assume that poor results of cognitive testing in 3-year-old children in any way doom them to lifelong problems, but

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rather, look broadly at what might be contributing to poorer performance and explore strategies to ameliorate these contributors.

Finally, the work of Rasmussen et al<sup>1</sup> as a whole suggests that brain health underlies all these findings. Certainly, multiple studies<sup>6</sup> confirm that walking speed reflects multiple aspects of brain health and aging. However, associations of gait speed and brain structure among these midlife individuals were weak. We should continue to learn more about how brains change across the life span, in terms of neural organization, connectivity, neurotransmitters, receptors, and subtle pathologic abnormalities. The human brain is dynamic; it is constantly reorganizing itself according to exposures and experience. It is affected as an end organ by many other organ systems. Perhaps in this sense, brain health, reflected in brain structure, cognition, and gait speed, is not necessarily a first cause, but rather may be a consequence or mediator of lifelong opportunities and insults.

Nevertheless, gait speed is a simple, inexpensive indicator of well-being across adulthood. Let's pay attention and use it.

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#### ARTICLE INFORMATION

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