No time to wait: daily step counts should be incorporated into physical activity guidelines.

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In the last several years, there have been many analyses on the role of steps on cardiovascular and cause-specific outcomes and mortality, evaluating not only the role of steps/day in different populations, but also the role of speed/cadence (stride length), the role of change of pace or the impact of intermittence of the physical activity [1-5]. This is of particular importance, as physical activity levels are worryingly low, with only 30% of adults being insufficiently active. A mere 22% of individuals over 65 years meet the WHO recommendations for minimum physical activity per week, with only 40% reporting regular physical activity and just one in five engaging in daily physical activity [2,3]. Importantly, based on various data, physical inactivity may be attributable to as many as 3.2 million deaths per year (with 2.6 million in low- and middle-income countries), and is the fourth highest risk factor for death in the world, ahead of unsafe sex, undernutrition, and alcohol use [6,7]. It is also worth emphasising that the global estimate of the cost of physical inactivity to public healthcare systems between 2020 and 2030 is about US$ 300 billion (approximately US$ 27 billion per year) if levels of physical inactivity are not reduced [6].

The recent meta-analysis by Ding *et al.* also raised these important issues, addressing all the most important endpoints that physical activity (PA) may impact, from all-cause mortality, cardiovascular incidence and mortality, and cancer incidence and mortality, to dementia, depressive symptoms, physical function and falls [1]. The authors also attempted to examine the effect of physical activity (PA) using different devices (accelerometer vs. pedometer-measured steps), which is mostly raised as a limitation of similar analyses; however, they failed to indicate what method is superior, which would be beneficial to make recommendations regarding the optimal method for step measurement. It seems, however, what obviously still needs to be confirmed, that the more important thing is to simply take steps and have physical exercise, rather than the method we used for steps calculation [1,5]. The authors also attempted to evaluate the effect of cadence (peak 30-min step cadence) on health benefits; however, the results were ultimately rather inconclusive [1]. While cadence is a significant factor in running speed, it is not the sole determinant. Optimising both cadence and stride length, along with other factors, is essential for improving speed, which seems to be better understood from a practical perspective [4]. It seems that the pacing (different exercise intensity) has more evidence on beneficial health outcomes, even in children and adolescents [8].

Another issue that still needs to be further investigated is what benefits we should expect when comparing the steps effect for generally healthy individuals and those with concomitant diseases, like diabetes, cardiovascular disease, cancer, and other concomitant chronic disease [1-5]. Despite the authors including patients with various conditions, they did not perform separate analyses for apparently healthy subjects and those with chronic diseases to ascertain

whether the effect of PA might differ. Considering the potential plateau effect of exercise at approximately 16,000 steps, observed in many available analyses, and the ongoing debate regarding the effect of 20,000 steps or more (extremely intensive PA) on health outcomes [5,9,10], it is regrettable that the authors limited their analyses (even acknowledging the potential paucity of data) to around 12,000 steps/day. Given the increasing number of people engaging in extremely intensive physical activity (with daily step counts exceeding 20,000-30,000), we need to determine whether we continue to observe health benefits consistent with the "the more, the better" rule, or whether such activity might even be harmful [5,9,10].

In their meta-analysis, the authors showed that comparing largely sedentary individuals averaging 2,000 steps per day (typically defined as basal activity, which is arguably a low reference number, even for those with health limitations, yet observed in previous analyses) with those averaging 7,000 steps per day, demonstrating substantial benefits from increasing step counts for the endpoints investigated [1]. However, it should be emphasised that the average adult takes between 3,000 and 4,000 steps per day (approximately 2.5 km), and that walking fewer than 5,000 steps per day is considered sedentary (some studies suggest a lower threshold, e.g. <4,300 [11]). Based on these results, which align with our previous analysis [5], a revision of the definition of a sedentary lifestyle to <4000 steps/day should be considered. It is also somewhat surprising, and at odds with previous analyses [12], that such an increase was not associated with a significant reduction in cancer incidence, warranting further investigation, specifically examining the types of cancers considered.

Another point in discussion for the benefits of walking is when to start regular PA? Thus, the authors rightly identified age as a potential differentiating factor, which we addressed in our previous analysis, suggesting a significantly lesser impact of physical activity in older versus younger adults (42.3 vs 48.7% all-cause death reduction [5]), supporting the approach “the earlier, the better” for starting PA is preferable. Interestingly, the authors’ results appear to contradict the aforementioned findings. Nonetheless, similarly to our results, the greatest effect on outcomes was achieved with higher step counts for younger versus older adults (in our study, 7-13 and 6-10 thousand, respectively) [5]. However, the authors’ results might suggest this is associated with a greater reduction of the investigated outcomes for older adults (especially for CVD incidence) [1]. Therefore, this issue still requires further investigation, and we cannot yet conclude whether differing step targets should be recommended for younger and older adults.

I believe we should also exercise caution with the wording (we faced the same problems after publication of our meta-analysis, that suggested significant health benefits at as few as 4000 steps/day [5]), as presenting in the meta-analysis the statistical attenuation or lack of improvement at 7000 steps and beyond for some of the investigated outcomes could be demotivating for many who currently achieve more than 7000 steps/day, particularly given that the authors’ results actually indicate the contrary. Examining the authors’ results for 12,000 steps, we observe a greater reduction, with, for example, a doubling of the risk reduction for cancer incidence (from 6 to 12%) and an additional 8% increase in all-cause death risk reduction (from 47% to 55%). Furthermore, there is a significant benefit above 7000 steps/day for all-cause mortality, cardiovascular disease incidence, cancer mortality, dementia and depressive symptoms, suggesting that more is better for longevity [1]. It would also be useful to ascertain

the degree to which changes of 500 steps/day (rather than 1000/day), as assessed in our analysis, which demonstrated a further 7% reduction in cardiovascular mortality for every 500-step increase [5], might be beneficial, as this could be far more motivating for the stepwise increase in daily step count for our patients.

Despite some of the aforementioned points that may still raise questions for discussion, the authors of the meta-analysis [1] deserve congratulations for their remarkable effort and critically important results. Based on these findings and numerous other available data suggesting a significant association between the daily steps and health outcomes [13] I firmly believe that, similarly to the recent International Lipid Expert Panel (ILEP) recommendations on simple tips for a healthy heart (ILEP-SMILE), which include step counts as part of the guidance (at least 4,000 steps per day; preferably 6-13,000 depending on age; and the more the better up to 20,000 steps/day) [10], daily step counts should be incorporated into all forthcoming guidelines (**Figure 1**).

Figure 1. Proposal for the forthcoming recommendations on physical activity (based on [15] and recent data [1,4-6,11,14]).

References:

1. Ding D, Nguen B, Nau T, et al. Daily steps and health outcomes in adults: a systematic review and dose-response meta-analysis. The Lancet Public Health 2025; doi: 10.1016/S2468-2667(25)00164-1.
2. Health at a Glance: Europe 2024. State of Health in the EU Cycle: https://www.oecd.org/en/publications/health-at-a-glance-europe-2024
3. https://www.who.int/news-room/fact-sheets/detail/physical-activity
4. Nascimento LR, de Oliveira CQ, Ada L, Michaelsen SM, Teixeira-Salmela LF. Walking training with cueing of cadence improves walking speed and stride length after stroke more than walking training alone: a systematic review. J Physiother. 2015 Jan;61(1):10-5. doi: 10.1016/j.jphys.2014.11.015.
5. Banach M, Lewek J, Surma S, Penson PE, Sahebkar A, Martin SS, Bajraktari G, Henein MY, Reiner Ž, Bielecka-Dąbrowa A, Bytyçi I. The association between daily step count and all-cause and cardiovascular mortality: a meta-analysis. Eur J Prev Cardiol. 2023 Dec 21;30(18):1975-1985.
6. Strain T, Flaxman S, Guthold R, Semenova E, Cowan M, Riley LM, Bull FC, Stevens GA; Country Data Author Group. National, regional, and global trends in insufficient physical activity among adults from 2000 to 2022: a pooled analysis of 507 population-based surveys with 5·7 million participants. Lancet Glob Health. 2024 Aug;12(8):e1232-e1243. doi: 10.1016/S2214-109X(24)00150-5.
7. WHF: Physical activity: vital to global health: https://world-heart-federation.org/wp-content/uploads/2021/05/WHF-Factsheet-Physical-activity.pdf
8. Zhou X, Li J, Jiang X. Effects of different types of exercise intensity on improving health-related physical fitness in children and adolescents: a systematic review. Sci Rep. 2024 Jun 21;14(1):14301. doi: 10.1038/s41598-024-64830-x.
9. Rogers EM, Banks NF, Jenkins NDM. Acute effects of daily step count on postprandial metabolism and resting fat oxidation: a randomized controlled trial. J Appl Physiol (1985). 2023 Oct 1;135(4):812-822.
10. What Happened When I Started Walking 20,000 Steps a Day: https://www.vogue.com/article/walking-20000-steps
11. Cheng SWM, Alison JA, Stamatakis E, Dennis SM, McKeough ZJ. Validity and Accuracy of Step Count as an Indicator of a Sedentary Lifestyle in People With Chronic Obstructive Pulmonary Disease. Arch Phys Med Rehabil. 2023 Aug;104(8):1243-1252.

12. Shreves AH, Small SR, Walmsley R, Chan S, Saint-Maurice PF, Moore SC, Papier K, Gaitskell K, Travis RC, Matthews CE, Doherty A. Amount and intensity of daily total physical activity, step count and risk of incident cancer in the UK Biobank. Br J Sports Med. 2025 Jun 3;59(12):839-847.
13. Yuan L, Tian Z, Jia X, Chen Z. The Association Between Daily Step Count, Step Frequency and the Risk of Chronic Obstructive Pulmonary Disease: A Cross-Sectional Study Using NHANES Data. Int J Chron Obstruct Pulmon Dis. 2025 Jul 8;20:2325-2335.
14. Banach M, Fogacci F, Atanasov AG, Pantea Stoian A, Jóźwiak J, Bytyci I et al. A 360° perspective on cardiovascular prevention: the International Lipid Expert Panel SiMple tIps for the heaLthy hEart (ILEP-SMILE). Archives of Medical Science. 2025;21(3):711-8. https://doi.org/10.5114/aoms/205732.
15. Visseren FLJ, Mach F, Smulders YM, Carballo D, Koskinas KC, Bäck M, et al.; ESC National Cardiac Societies; ESC Scientific Document Group. 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice. Eur Heart J. 2021;42(34):3227-3337.

Recommendation	Class	Level
It is recommended that adults of all ages to engage in at least 150 to 300 minutes of individualized moderate-intensity[1] aerobic physical activity (PA) per week, or 75 to 150 minutes of vigorous-intensity[2] PA, preferable an equivalent combination of both, to reduce all-cause and cause-specific mortality, cardiovascular events and mortality, cancer incidence, the onset diabetes, dementia, depressive symptoms, and falls, while improving physical function.	I	B
It is recommended that adults begin regular exercise - preferably every day - as early as possible to effectively invest in their health and prevent civilization diseases.	I	A
In addition to regular physical activity (PA), it is recommended to optimally manage all other cardiovascular risk factors using the ILEP-SMILE algorithm to prevent the atherosclerosis or atheroma plaque progression.	I	A
It is recommended that adults who are unable to perform 150 minutes of moderate-intensity physical activity (PA) per week should remain as active as their abilities and health conditions allow, making gradual attempts to increase their level of PA.	I	B
At least 4,000 steps per day is recommended, with a preference for 7,000 to 13,000 steps depending on age (the more, the better, up to an average of 20,000 steps per day), as an alternative to minutes of activity, to reduce all-cause and cause-specific mortality, cardiovascular mortality, and morbidity.	IIa	B
It is recommended to vary the pace (cadence[4]) while walking every day to effectively stimulate the cardiovascular system.	I	B
A sedentary lifestyle involves spending most of your day sitting or lying down with little to no PA. It is defined as spending 6 or more hours per day in sedentary activities or taking fewer than 4,000 steps per day.	IIa	B
It is recommended to reduce sedentary time to engage in at least light activity throughout the day to reduce all-cause and CV mortality and morbidity.	I	B

[1] Walking at a moderate pace (4.1–6 km/h), slow cycling (up to 15 km/h), activities such as painting, decorating, vacuuming, gardening, doubles tennis, ballroom dancing, or water aerobics; breathing is faster but still allows for speaking in full sentences (needs to be individualized); [2] Walking at a fast pace (>6 km/h), jogging or running, cycling at speeds greater than 15 km/h, swimming laps, or playing tennis; breathing is very hard and incompatible with comfortably carrying on a conversation (needs to be individualized); [3] Watching TV, using a computer, or working at a desk, etc.; A cadence of 100-120 steps per minute is generally considered a healthy threshold for moderate exercise, while cadences >120 steps per minute indicates vigorous activity.

Figure 1