

Letter to the Editor (QJM)

Title: Celebrating 100 years of VO₂max

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The year 2023 marks the 100th anniversary of the “maximum oxygen intake” (VO₂max), first described by Hill and Lupton in the QJM in 1923.¹ These authors suggested an upper limit to oxygen intake depending on the capability of the cardiorespiratory system to deliver inspired oxygen to the working muscles.

Since then, whether the cardiorespiratory system (oxygen delivery), the exercising muscles (capillarization and mitochondrial oxidative capacity) and/or regulation by the central nervous system primarily limit VO₂max has been heavily debated.² In fact, this remains to be unambiguously clarified even today. However, a major role of the cardiorespiratory system for VO₂max is now undisputed, if large muscle groups are involved during intense exercise (e.g., 2-legged pedaling).³

Nowadays, VO₂max is among the most assessed parameters in sports medicine. It defines the upper limit of aerobic endurance performance, varying from values below 15 mL/min/kg in heart failure patients to >90 mL/min/kg in elite endurance athletes.^{4,5} Only a few weeks of exercise training or training cessation suffice to improve or reduce VO₂max, respectively, rendering it a sensitive indicator of cardiorespiratory fitness. Since the cardiorespiratory system capacity determines health and well-being, a high VO₂max is associated with reduced mortality risk and longevity – independent of age, sex, ethnicity and comorbidities.⁶ Consequently, VO₂max has emerged as important biomarker of cardiovascular health and is even called upon to be included in routine assessment of risk factors in clinical practice. VO₂max is 100 years old – and fitter by the day!

The authors declare no competing interests.

References

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