

Publication**New Data-based Cutoffs for Maximal Exercise Criteria across the Lifespan.****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 4614338**Author(s)** Wagner, Jonathan; Niemeyer, Max; Infanger, Denis; Hinrichs, Timo; Streese, Lukas; Hanssen, Henner; Myers, Jonathan; Schmidt-Trucksäss, Arno; Knaier, Raphael**Author(s) at UniBasel** [Schmidt-Trucksäss, Arno](#) ;**Year** 2020**Title** New Data-based Cutoffs for Maximal Exercise Criteria across the Lifespan.**Journal** Medicine and science in sports and exercise**Volume** 52**Number** 9**Pages / Article-Number** 1915-1923

To determine age-dependent cutoff values for secondary exhaustion criteria for a general population free of exercise limiting chronic conditions; to describe the percentage of participants reaching commonly used exhaustion criteria during a cardiopulmonary exercise test (CPET); and to analyze their oxygen uptake at the respective criteria to quantify the impact of a given criterion on the respective oxygen uptake ($\dot{V}O_2$) values.; Data from the COMplete-Health Study were analyzed involving participants from 20 to 91 yr of age. All underwent a CPET to maximal voluntary exertion using a cycle ergometer. To determine new exhaustion criteria, based on maximal respiratory exchange ratio (RERmax) and age-predicted maximal HR (APMHR), one-sided lower tolerance intervals for the tests confirming $\dot{V}O_2$ plateau status were calculated using a confidence level of 95% and a coverage of 90%.; A total of 274 men and 252 women participated in the study. Participants were nearly equally distributed across age decades from 20 to >80 yr. A $\dot{V}O_2$ plateau was present in 32%. There were only minor differences in secondary exhaustion criteria between participants exhibiting a $\dot{V}O_2$ plateau and participants not showing a $\dot{V}O_2$ plateau. New exhaustion criteria according to the tolerance intervals for the age group of 20 to 39 yr were: RERmax ≥ 1.13 , APMHR210 - age $\geq 96\%$, and APMHR208 ≥ 0.7 age $\geq 93\%$; for the age group of 40 to 59 yr: RERmax ≥ 1.10 , APMHR210 - age $\geq 99\%$, and APMHR208 ≥ 0.7 age $\geq 92\%$; and, for the age group of 60 to 69 yr: RERmax ≥ 1.06 , APMHR210 - age $\geq 99\%$, and APMHR208 ≥ 0.7 age $\geq 89\%$.; The proposed cutoff values for secondary criteria reduce the risk of underestimating $\dot{V}O_{2max}$. Lower values would increase false-positive results, assuming participants are exhausted although, in fact, they are not.

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