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Why intensity is not a bad word - benefits and practical aspects of high effort resistance training to the older

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Dear Editor,

We would like to congratulate Hunter et al. [1] for their excellent work. If we may, we would like to further this discussion in order to clarify issues regarding practical aspects of high effort\(^1\) resistance training (RT) for older people.

Ageing is associated with a decrease in protein synthesis, specially type II fibers [2]; however, although the fractional rate of muscle protein synthesis is lower in the elderly than in the young, it increases to a comparable rate in both age groups in response to high effort RT [3]. Therefore, muscle mass and functional performance do not seem to be an inevitable effect of ageing, but rather a consequence of refraining from high effort physical activities. In agreement with this, Candow et al. [4] reported that 22 weeks of high effort RT eliminates age-related deficits in muscle mass and strength in older (60-71 years) when compared to young males (18-31 years). Other studies showed that when older and younger people are submitted to the same RT program, they show similar increases in muscle size [5] and that load progression and strength increases are similar among young and older men and women [6, 7]. The article by Hunter et al. supports this evidences and makes us question if the limited response by the elderly to RT seen in many cases may originate from over precaution in prescription of intensity of effort and the underestimation of their adaptive capacity, reinforced by physical activity guidelines for this population. For example, where RT has been implemented using a low effort prescription no significant improvements in any outcome measures occurred compared with a non-training control group [8]. Contrastingly, we have recently reported significant improvements in strength and body composition over a 6 months supervised RT intervention employing progressive introduction of higher efforts [9]

The importance of effort is not limited to muscle strength and hypertrophy. For example, Izumiya et al. showed that the activation of Akt partially reversed the negative effects of overfeeding in rats, including reductions in liver fat, adipocyte atrophy and improved glycemic control [10]. Considering that the activation of the mTOR axis may be related to type II fiber activation, and thus based upon Henneman’s size principle high motor efforts, it seems there are three important practical methods to achieve this:

\(^1\) We note that the term ‘effort’ is favoured here in place of ‘intensity’ to avoid the confusion that this can cause particularly with respect to resistance training (Steele, 2014) Steele J. Intensity; in-ten-si-ty; noun. 1. Often used ambiguously within resistance training. 2. Is it time to drop the term altogether? Br J Sports Med. 2014;48(22):1586-1588
using heavy relative loads, performing exercises at high velocity, and training to
momentary failure. Interestingly, Ibanez et al. [11] reported reductions in body fat and
increases in insulin sensitivity in older people with type 2 diabetes performing high
effort RT, even with an increase in caloric intake. Moreover, previous studies from
Paoli et al. [12, 13] showed concomitant reductions in body fat, increases in muscle
mass and improvements in health parameters in response to high effort RT in older
participants, without alterations in dietary habits.

Therefore, it is our opinion that the article by Hunter et al. [1] presents an
important message that should be considered by practitioners in order to help older
people to improve their health through high effort RT. Whilst adherence and
engagement present a challenge, we have demonstrated that it is possible to successfully
apply progressive introduction of higher effort RT in this population [9]. Possibly the
greater challenge though would be to combine efficiency and safety, especially because
ageing is associated with joint instability and a greater incidence of cardiovascular
problems such as arterial hypertension. In this regard, it might be wise to avoid the
performance of multiple sets and a high number of repetitions, since both seem to be
associated with higher cardiovascular stress [14-17]. Here, again, ‘intensity’ of effort
may not be a bad word, but volume may be.

References

[1] Hunter GR, Plaisance EP, Carter SJ, Fisher G. Why intensity is not a bad word:
and synthesis rate of muscle MHC and response to resistance exercise. Am J Physiol
training eliminates age-related deficits in muscle mass and strength in healthy older


