

# Strength training, the forgotten component when prescribing physical exercise for health

## La fuerza, la olvidada en la prescripción del ejercicio físico para la salud

**José Antonio de Paz Fernández**

*Especialista en Medicina del deporte. Instituto de Biomedicina (IBIOMED). Facultad CCAA Física y el Deporte. Universidad de León.*

---

The condition of being new in order to accept or reject a paradigm, is two sides of the same counterfeit coin.

Some 9 years have passed since the WHO published its recommendations on physical activity for health, offering the general public some minimum recommended targets for daily physical activity. The main new feature of this guide is the inclusion of the recommendation to perform muscle-strengthening activities (musculoskeletal strengthening) at least two or three times a week, regardless of age (in fact from 5 years upwards)<sup>1</sup>. Even so, these recommendations are all too frequently not included in the general exercise guidelines provided by medical practitioners.

And it is even more disturbing to see how old beliefs, that are now known to be false, are still being maintained and conveyed, with regard to “how strength training for children is a bad thing” as it affects the growth cartilage, or produces myocardial hypertrophy ... or “strengthening activities are really bad for those with high blood pressure or heart conditions” etc. Numerous studies that demonstrate the safety and benefits of exercises of this type on healthy children<sup>2-4</sup>, obese individuals<sup>5</sup>, or with heart diseases<sup>6</sup>, have been published. However, despite all this scientific and professional evidence, it has not been possible to do away with these misconceptions.

Luckily for the health of the general public, physical exercise is currently being recommended for patients affected by most chronic or degenerative disorders. However, medical practitioners are still not clearly recommending muscle-strengthening activities and, in some cases, they are even expressly advising against such exercises. This point can be illustrated by a survey conducted on 272,887 non-hypertensive and 179,789 hypertensive Americans. The respondents were asked whether, during their visit to the doctor, they had been recommended

to exercise and, if so, whether they were recommended to do only aerobic exercises, solely strengthening exercises or a combination of the two<sup>7</sup>. 36.9% of the healthy respondents had not been advised to exercise, neither had 45.7% of the hypertensive respondents. Of those who had been advised to exercise, 23.1% and 15% were recommended to do combined exercises and 9.5% and 7.3% solely strengthening exercises, for healthy and hypertensive respondents respectively. And this is despite the consensus agreements on exercise published by the various medical specialty or patient welfare societies. Even so, unfortunately it is not uncommon for patients suffering from a chronic disease or with after-effects to be advised against strengthening exercises. This is despite the evidence to the contrary found in scientific publications, showing how important and safe it is to do strengthening exercises, either on their own or together with the traditional aerobic exercises. Such is the case for patients suffering from ischemic heart disease<sup>8,9</sup>, hypertension<sup>10</sup>, diabetes<sup>11</sup>, arthritis<sup>12</sup>, osteoporosis<sup>13</sup>, multiple sclerosis<sup>14</sup>, cancer survivors in general<sup>15</sup> and breast cancer survivors in particular<sup>16,17</sup>, chronic obstructive pulmonary disease<sup>18,19</sup>, chronic kidney disease<sup>20</sup>... and a long list of other diseases and disorders.

Due to the discrepancy between what is known through science and what is recommended by medical practitioners, there are reduced possibilities of functional improvement and an improvement in the quality of life of the healthy population and infirm population alike. It would be advisable for those in sports medicine to intensify their pedagogical efforts towards general and specialty medicine with regard to the prescription of strengthening exercises. There are sufficient scientific consensuses, stances and recommendations to make it possible to correctly prescribe strength training in the healthcare context, for the general public<sup>21,22</sup>, children<sup>23</sup>, and cardiac patients<sup>24</sup>.

---

**Correspondence:** José Antonio de Paz Fernández  
E-mail: japazf@unileon.es

Although it is true that the benefits of exercise on health are related to the duration, intensity and frequency of the exercises, it is no less true that there is a relationship between the amount of strength training and its benefits on health. Not every exercise in which a resistance is successively overcome can be considered to be suitable strength training or a beneficial exercise to improve strength.

Strength training or exercises are not contraindicated. However poor training (incorrect load selection, incorrect load progression, incorrect technical execution, inadequate and unsafe means, etc.) is contraindicated.

## Bibliography

- World Health Organization. OMS | Recomendaciones mundiales sobre la actividad física para la salud. WHO. 2013. [https://www.who.int/dietphysicalactivity/factsheet\\_recommendations/es/](https://www.who.int/dietphysicalactivity/factsheet_recommendations/es/). Accessed January 21, 2019.
- Myers AM, Beam NW, Fakhoury JD. Resistance training for children and adolescents. *Transl Pediatr*. 2017;6(3):137-43.
- Faigenbaum AD. Youth Resistance Training: The Good, the Bad, and the Ugly—The Year That Was 2017. *Pediatr Exerc Sci*. 2018;30(1):19-24.
- Faigenbaum AD, Myer GD. Pediatric Resistance Training. *Curr Sports Med Rep*. 2010; 9(3):161-8.
- Goldfield GS, Kenny GP, Alberga AS, et al. Effects of aerobic training, resistance training, or both on psychological health in adolescents with obesity: The HEARTY randomized controlled trial. *J Consult Clin Psychol*. 2015;83(6):1123-35.
- Hollings M, Mavros Y, Freeston J, Fiatarone Singh M. The effect of progressive resistance training on aerobic fitness and strength in adults with coronary heart disease: A systematic review and meta-analysis of randomised controlled trials. *Eur J Prev Cardiol*. 2017;24(12):1242-59.
- Mu L, Cohen AJ, Mukamal KJ. Prevalence and predictors of resistance and aerobic exercise among hypertensive adults in the United States. *J Hum Hypertens*. 2015;29(6):394-5.
- Marzolini S, Oh PI, Brooks D. Effect of combined aerobic and resistance training versus aerobic training alone in individuals with coronary artery disease: A meta-analysis. *Eur J Prev Cardiol*. 2012;19(1):81-94.
- Xanthos PD, Gordon BA, Kingsley MIC. Implementing resistance training in the rehabilitation of coronary heart disease: A systematic review and meta-analysis. *Int J Cardiol*. 2017;230:493-508.
- de Sousa EC, Abrahim O, Ferreira ALL, Rodrigues RP, Alves EAC, Vieira RP. Resistance training alone reduces systolic and diastolic blood pressure in prehypertensive and hypertensive individuals: meta-analysis. *Hypertens Res*. 2017;40(11):927-31.
- Nery C, Moraes SRA De, Novaes KA, Bezerra MA, Silveira PVDC, Lemos A. Effectiveness of resistance exercise compared to aerobic exercise without insulin therapy in patients with type 2 diabetes mellitus: a meta-analysis. *Brazilian J Phys Ther*. 2017;21(6):400-15.
- Vincent KR, Vincent HK. Resistance Exercise for Knee Osteoarthritis. *PM&R*. 2012;4(5 Suppl):S45-S52.
- Bolam KA, van Uffelen JGZ, Taaffe DR. The effect of physical exercise on bone density in middle-aged and older men: A systematic review. *Osteoporos Int*. 2013;24(11):2749-62.
- Kjølhede T, Vissing K, Dalgas U. Multiple sclerosis and progressive resistance training: a systematic review. *Mult Scler J*. 2012;18(9):1215-28.
- Fuller JT, Hartland MC, Maloney LT, Davison K. Therapeutic effects of aerobic and resistance exercises for cancer survivors: a systematic review of meta-analyses of clinical trials. *Br J Sports Med*. 2018;52(20):1311.
- Cheema BS, Kilbreath SL, Fahey PP, Delaney GP, Atlantis E. Safety and efficacy of progressive resistance training in breast cancer: a systematic review and meta-analysis. *Breast Cancer Res Treat*. 2014;148(2):249-68.
- Santos WDN dos, Gentil P, de Moraes RF, et al. Chronic Effects of Resistance Training in Breast Cancer Survivors. *Biomed Res Int*. 2017;2017:1-18.
- Iepsen UW, Jørgensen KJ, Ringbaek T, Hansen H, Skrubbeltrang C, Lange P. A Systematic Review of Resistance Training Versus Endurance Training in COPD. *J Cardiopulm Rehabil Prev*. 2015;35(3):163-72.
- Liao W -h., Chen J -w., Chen X, et al. Impact of Resistance Training in Subjects With COPD: A Systematic Review and Meta-Analysis. *Respir Care*. 2015;60(8):1130-45.
- Chan D, Cheema BS. Progressive Resistance Training in End-Stage Renal Disease: Systematic Review. *Am J Nephrol*. 2016;44(1):32-45.
- American College of Sports Medicine. Progression Models in Resistance Training for Healthy Adults. *Med Sci Sport Exerc*. 2009;41(3):687-708.
- Kraemer WJ, Ratamess NA. Fundamentals of resistance training: progression and exercise prescription. *Med Sci Sports Exerc*. 2004;36(4):674-88. <http://www.ncbi.nlm.nih.gov/pubmed/15064596>. Accessed February 3, 2019.
- Behm DG, Faigenbaum AD, Falk B, Klentrou P. Canadian Society for Exercise Physiology position paper: resistance training in children and adolescents. *Appl Physiol Nutr Metab*. 2008;33(3):547-61.
- Williams MA, Haskell WL, Ades PA, et al. Resistance Exercise in Individuals With and Without Cardiovascular Disease: 2007 Update. *Circulation*. 2007;116(5):572-84.

# Analizador Instantáneo de Lactato Lactate Pro 2

arkray  
LT-1730

- Sólo 0,3 µl de sangre
- Determinación en 15 segundos
- Más pequeño que su antecesor
- Calibración automática
- Memoria para 330 determinaciones
- Conexión a PC
- Rango de lectura: 0,5-25,0 mmol/litro
- Conservación de tiras reactivas a temperatura ambiente y
- Caducidad superior a un año



Importador para España:



c/ Lto. Gabriel Miro, 54, ptas. 7 y 9  
46008 Valencia Tel: 963857395  
Móvil: 608848455 Fax: 963840104  
info@bermellelectromedicina.com  
www.bermellelectromedicina.com



Monografías Femedé nº 12  
Depósito Legal: B. 27334-2013  
ISBN: 978-84-941761-1-1  
Barcelona, 2013  
560 páginas.



Dep. Legal: B.24072-2013  
ISBN: 978-84-941074-7-4  
Barcelona, 2013  
75 páginas. Color



## Índice

Foreward  
Presentación  
1. Introducción  
2. Valoración muscular  
3. Valoración del metabolismo anaeróbico  
4. Valoración del metabolismo aeróbico  
5. Valoración cardiovascular  
6. Valoración respiratoria  
7. Supuestos prácticos  
Índice de autores

## Índice

Introducción  
1. Actividad mioeléctrica  
2. Componentes del electrocardiograma  
3. Crecimientos y sobrecargas  
4. Modificaciones de la secuencia de activación  
5. La isquemia y otros indicadores de la repolarización  
6. Las arritmias  
7. Los registros ECG de los deportistas  
8. Términos y abreviaturas  
9. Notas personales

Información: [www.femedé.es](http://www.femedé.es)