

EXERCISE PRESCRIPTION FOR THE HEART

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The link between physical inactivity and coronary heart disease is universally known. It is estimated that over 30% of coronary heart disease worldwide is due to physical inactivity. This evidence draws attention to the importance of exercise in both primary prevention and in secondary prevention measures such as cardiac rehabilitation. Besides the direct positive impact on cardiovascular health, exercise training has been found to impact in a positive way also indirectly on some milestone risk factors such as hypertension, insulin resistance and glucose tolerance, and lipid profile. International guidelines include exercise training beside pharmacological therapies, developing a specific type of training modality tailored for each subpopulation of cardiovascular patients and their risk factors. In the clinical practice, it is not always feasible grouping patients into a specific category, due to the variety of their co-morbidities and risk factors. The purpose of this lecture is to introduce the innovation of the recent evidence based notions appeared in the scientific literature, trying to insert them into clinical practice giving a simple but yet effective instrument to the health care professional.

We start announcing physical activity-physical fitness dilemma, the different types of exercise protocols (arranged for intensity, method, type, application, control and setting) and the three descriptors of exercise dose (duration, frequency and intensity). Then we will define METs and kilo calories utilization as the two fundamental approaches to describe energy expenditure, and in conclusion of this prefatory section, we will mark out the importance of cardiopulmonary exercise test as the gold standard for the assessment of functional evaluation in exercise prescription in everyone who need to undergo an aerobic training program,

describing VO₂ at the first and second ventilatory thresholds and peak VO₂ as the headlines of the aerobic energetic yield during incremental exercise, outlining the recent trend to shift from a ‘range based’ to a ‘threshold-based’ aerobic exercise intensity prescription.

The second section of the lecture will sum up the guidelines for specific subgroups of population:

- General population, in a setting of primary prevention;
- Older adults, describing the combination of different training and the effects of sedentary lifestyle on the health and cardiovascular and skeletal system;
- Children, and the importance of school-based physical education program in decreasing in prevalence of obesity, reductions in blood lipids, increasing in PA levels and fitness;
- Women, for whom literature is still poor and not well developed;
- Cardiac patients suitable for cardiopulmonary rehabilitation and the importance of anaerobic threshold as the benchmark which can guarantee the safety keeping the exercise intensity below the myocardial ischemia threshold but yet achieving the desideratum outcome of rehabilitation.

The third section of the work summarizes some notions on the latest topics appeared in literature:

- Prescription and proscriptio of resistance training in secondary prevention of cardiac patients;
- Interval training and the comparison between two different type of model and the impact on work performance;
- High intensity interval training in patients with coronary heart disease and chronic heart failure compared with the results provided by continuous aerobic exercise training;

- The importance of placing the risks in perspective in order to tip the scales always in advance of benefits and never of dangers related to physical activity.

We finally end up announcing the recent proposes on how barriers in exercise prescription in clinical practice can be overtaken, in order to finally allow every health care professional to use with trust and safety one of the most costless and promising therapeutic option we are provided with.