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Physical Activity, an Essential Part of Primary and Secondary Disease Prevention

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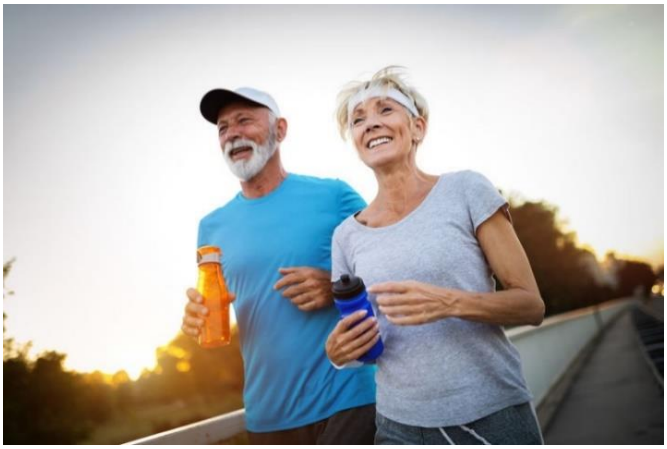

As humans we are designed to move. ACSM defines physical activity as “any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure” (1). Regular physical activity has been proven to reduce all-cause mortality and decrease the overall risk of adverse cardiovascular events (2,3). A dose response relationship between physical activity and health is present. Current recommendations from ACSM advise 150 minutes a week of moderate intensity aerobic activity or 75 minutes a week of vigorous intensity aerobic activity (1). Physical activity is found to decrease blood pressure through improving arterial function, improving insulin sensitivity ultimately reducing circulating blood glucose, as well as improving mortality rates 15%-28% in patients with a history of adverse cardiac events (2,3). Supervised physical activity in the form of exercise-based cardiac rehab has even become an essential part of secondary prevention (3).

Hypertension, often referred to as the silent killer, is an extremely prevalent cardiovascular disease risk factor in a majority of developed countries. Unfortunately, it has been discovered that in 2011 hypertension that was left untreated was responsible for 54% of deaths due to stroke and 47% of deaths due to ischemic heart disease caused by endothelium damage (3). Exercise may improve endothelial cell function allowing increases in vasodilatory factors such as nitric oxide, decreases in vasoconstrictor factors such as norepinephrine, and ultimately increasing the vessel diameter which has the downstream effects of taking a workload off of the heart (3). Such improvements in arterial function through physical activity, especially in the form of supervised exercised based cardiac rehab, have been found to reduce blood pressure 5-7 mmHg in hypertensive individuals and 2-4 mmHg in individuals with average blood pressure (3). Fantastic responses can be found in blood glucose regulation as well.

Physical activity has long been known to be beneficial in diabetic care. Elevated blood glucose increases the risk for acute and chronic health issues including macrovascular and microvascular complications (3). Exercise training improves insulin sensitivity leading to improvements in insulin-mediated glucose disposal. The mechanisms include increases in available glucose transporters (GLUT4) in skeletal muscle ultimately improving glucose disposal (3). However, the effect of physical activity on insulin action is found to only last a few days placing a huge importance on consistent exercise to induce chronic improvements in blood glucose regulation.

Exercise based cardiac rehabilitation has been a key part of secondary prevention and may enhance peak VO2, alleviate symptoms such as fatigue/dyspnea, and ultimately improve quality of life in individuals who have experienced adverse cardiac events (4). A recent study conducted by Li-Ying Kuo et al. in 2016 has reported beneficial outcomes in CAD patients and post CABG patients including higher event free rates (4). This study concludes that the mortality risk was 2-fold higher in patients with acute MI, CABG, or PCI who attended less than 25% of cardiac rehabilitation attendance (4). The 1 year and 5-year mortality rates were even found to decrease 58% and 19% for those patients with greater cardiac rehabilitation attendance (4). In order to achieve the fantastic benefits of physical activity previously mentioned, it is key to get and keep your patients moving!

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