

Title: Exercise-based secondary prevention program impacts physical activity behavior and cardiorespiratory fitness in older outpatients after acute coronary syndrome.

Authors: **Andrea Raisi, MSc** (Center for Exercise Science and Sport, University of Ferrara; PhD Program in Environmental Sustainability and Wellbeing, University of Ferrara), **Valentina Zerbini, MSc** (Center for Exercise Science and Sport, University of Ferrara; PhD Program in Environmental Sustainability and Wellbeing, University of Ferrara), **Jonathan Myers, MD, PhD** (Division of Cardiology, VA Palo Alto), ***Tommaso Piva, MSc** (Center for Exercise Science and Sport, University of Ferrara; PhD Program in Environmental Sustainability and Wellbeing, University of Ferrara), **Gianluca Campo, MD** (Cardiology Unit, Azienda Ospedaliera Universitaria di Ferrara), **Rita Pavasini, MD** (Cardiology Unit, Azienda Ospedaliera Universitaria di Ferrara), **Elisabetta Tonet, MD** (Cardiology Unit, Azienda Ospedaliera Universitaria di Ferrara), **Giovanni Grazi, MD** (Center for Exercise Science and Sport, University of Ferrara; Healthy Living for Pandemic Event Protection (HL-PIVOT) Network), **Gianni Mazzoni, MD** (Center for Exercise Science and Sport, University of Ferrara), **Simona Mandini, PhD** (Center for Exercise Science and Sport, University of Ferrara)

Background: Older cardiac patients show the highest risk of sedentary behavior and mobility limitation. Despite benefits of physical activity are well-recognized in secondary prevention programs, patients with acute coronary syndrome (ACS) are less likely to attend traditional center-based interventions.

Objectives: To examine long-term changes in behavior and exercise capacity of patients with ACS involved in a center- and home-based secondary prevention program.

Methods: A total of 118 patients (mean age 76 years) was analyzed. Main outcomes were long-term changes in self-reported weekly leisure-time physical activity (wLTPA), walking speed (WS) and estimated cardiorespiratory fitness (eCRF, VO_2 peak). Intervention program consisted of 7 individual on-site sessions including motivational interviewing to reach exercise goals. Exercise prescription was based on the results of a treadmill walk test to estimate VO_2 peak. Functional variables were assessed during each visit after discharge.

Results: Follow-up at 6-, 12-, and 24-months, was completed by 87, 76, and 70 patients respectively. wLTPA significantly increased during the follow-up period (median METs/h/week 2.5, 11.2, 12.0, and 13.4 at baseline, 6-, 12-, and 24-months, respectively; $P < 0.0001$). These results were associated with increasing median WS (2.9 ± 1.0 , 4.3 ± 1.2 , 4.5 ± 1.1 , 4.5 ± 1.2 km/h, respectively, $P < 0.0001$), and VO_2 peak (16.5, 21.4, 21.1, 21.3 mL/kg/min, respectively, $P < 0.0001$).

Conclusions: This early, individualized exercise intervention improved long-term adherence to a physically active lifestyle, walking capacity and eCRF in older patients after ACS. Results may provide valuable insights for the development of exercise-based secondary prevention programs.