

Reducing sedentary time in clinical populations: The Take a STAND for health study

Cumulative evidence has shown that sedentary behavior (i.e., excessive time spent while in a sitting or reclining posture) is a strong and independent factor predisposing to poor health-related outcomes and all-cause mortality in several populations. In this context, new interventions focused on reducing sedentary time could be of great therapeutic relevance. To date, however, studies assessing this topic remain scarce. This research program aims to comprehensively investigate the clinical, physiological, metabolic, and molecular effects of reducing sedentary behavior in specific clinical populations. To that end, we will perform three distinct randomized controlled trials and three acute laboratorial studies involving rheumatoid arthritis, bariatric and mild cognitive impairment patients. All of these studies are under the umbrella title Take a STAND for health. The 4-month parallel-group randomized controlled trials aim to investigate the feasibility and efficacy of a newly developed personalized intervention focused on replacing sedentary time with light-(or very light-) intensity physical activity in these populations. A multitude of gold-standard techniques will be applied to evaluate the effects of the intervention on several outcomes, including sedentary time (primary outcome), physical activity levels, clinical parameters specific to each condition, cardiometabolic risk factors, immune function, and health-related quality of life. In addition, skeletal muscle and blood samples will be collected and a variety of molecular analyses will be performed to gather knowledge on the potential mechanisms which underpin the response to this intervention. The cross-over acute studies mainly aim to unravel potential mechanisms underlying the effects of successive breaks in prolonged sitting (i.e., 3-minute bouts of light-intensity walking every 30 minutes for 8 hours) versus 30-minutes of exercise followed by prolonged sitting or prolonged sitting only (control condition), in a well-controlled laboratorial condition. We will assess physiological and metabolic parameters (i.e., arterial blood pressure, heart rate, insulin sensitivity surrogates, lipid profile, and inflammatory markers) throughout the experimental sessions. In addition, we will explore the molecular responses in skeletal muscle and in blood, elicited by the interventions, through targeted analyses of candidate genes and proteins potentially modulated by physical (in)activity as well as untargeted analyses, by means of proteomic and metabolomic approaches. Our research team involves several national and international leading experts who act from clinical to translational sciences; and our research facilities are perfectly suited to conducting the planned studies. Findings emerging from this research program will be of paramount clinical relevance since they could provide the foundation for new prescriptions focused on reducing sedentary behavior, which is an important, modifiable and so far, overlooked risk factor in clinical populations. From a scientific standpoint, this project will originate a body of cutting-edge data, which could be highly influential in broad scientific fields, including Medical Sciences, Exercise Science, Public Health, and Basic Sciences.