

Treating heart failure with exercise: How much is enough?

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More than 14 million Europeans suffer from heart failure, roughly half of which is caused by diastolic heart failure, known by doctors as HFPEF. OptimEx, a new 3.5-year study funded by the European Union and coordinated by the Norwegian University of Science and Technology (NTNU), will look at whether exercise could be used both to prevent and treat HFPEF.

HFPEF, or Heart Failure with Preserved Left Ventricular Ejection Fraction, is the only cardiovascular disease that is increasing in prevalence and incidence in the Western world, probably because of the ageing population. It is characterized by stiffness of the heart muscle, which causes edema, breathlessness and an impaired ability to [exercise](#).

Women and the elderly are most commonly afflicted by diastolic [heart failure](#), but hypertension, diabetes, obesity and physical inactivity also represent important risk factors. However, there is no effective treatment for HFPEF, which makes it one of the most pressing unmet clinical needs in Europe.

OptimEx, a coalition of researchers from five European universities, will examine whether exercise could help treat or even prevent the development of this disease. The EU's Seventh Framework Programme for Research (FP7) has funded the project with a 3 million euro grant for 3.5 years, beginning in October 2013.

"Exercise has previously been found to improve cardiac function in [heart](#)

[failure patients](#), but still, our knowledge is very limited," says Professor and OptimEx coordinator, Ulrik Wisløff, who is also head of NTNU's K.G. Jebsen – Center of Exercise in Medicine. "The OptimEx study will give us answers on how to prevent and limit the extent of heart failure through exercise."

Wisløff said the group will use animal models to better understand the pathophysiological mechanisms involved in heart failure, and how exercise may be protective. That information will allow researchers to identify new therapeutic targets to develop medical treatments.

The study will also include a clinical trial of 200 patients, who will be randomly assigned to groups that will follow exercise protocols of different intensity and lengths. The groups will be followed for one year. Researchers will examine a number of questions:

1. How much exercise (duration, intensity, frequency,) is most effective and beneficial?
2. What are the leading pathophysiological mechanisms that are modified by different amounts of exercise?
3. How can doctors make sure that their patients continue to exercise as well as make longstanding lifestyle changes?
4. How can a better understanding of the mechanisms of the disease be translated into future targeted therapies, including drugs?

Another important aspect of the project involves the development and testing of telemedicine devices designed to make sure that patients are doing what they are supposed to do. For example, participants will wear accelerometers that will monitor daily activity. A feedback loop from the device to a central server makes it possible for the project staff to motivate participants to make adjustments to get back on track, if their activity level gets too low.

OptimEx is composed of the Antwerp University Hospital, the University of Graz, Leipzig University Hospital, the Technical University of Munich, the Norwegian University of Science and Technology and Vitaphone, a German company that will establish a telemedicine platform as part of the project.

Provided by Norwegian University of Science and Technology

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