STUDY TITLE

INTERACTIONS BETWEEN PHYSICAL TRAINING AND MEDICATION IN PATIENTS WITH METABOLIC SYNDROME

INFORMED CONSENT FORM (30 AUGUST, 2017)

INFORMATION SHEET AND INFORMED CONSENT FOR THE PARTICIPANT
(adapted to August 30, 2017)

Study title. INTERACTIONS BETWEEN PHYSICAL TRAINING AND MEDICATION IN PATIENTS WITH METABOLIC SYNDROME

Research team:

• Ricardo Mora Rodríguez (Responsible for the project). University Professor, Exercise Physiologist; Faculty of Sports Sciences. University of Castilla-La Mancha (UCLM)

• Juan Fernando Ortega Fonseca. Graduate in medicine and surgery. Specialty in Sports Medicine. Doctor from the University of Castilla-La Mancha (UCLM).

• Félix Morales Palomo. Master in Exercise Sciences. Doctoral student at the University of Castilla-La Mancha.

• Miguel Ramírez Jimenez. Master in Exercise Sciences. Doctoral student at the University of Castilla-La Mancha.

Objective. Being overweight leads to abdominal obesity and this, over time, to hypertension, dyslipidemia and diabetes. To prevent this development, their doctor prescribes medication. The objective of this study is to determine if physical training amplifies the actions of the medications that you have been prescribed.

Requirements to participate. You and 40 other adults between the ages of 25 and 65 will participate in this study. All will be overweight and will not regularly participate in sports activities. In addition to being overweight and abdominally obese, you must have 2 other metabolic syndrome factors (hypertension, high fasting glucose or triglycerides, or low levels of “good” cholesterol). You are advised to seek a physician's opinion before enrolling in this study. You must not have any other endocrine pathology other than the one that resulted in the prescription of your medication. If you are a woman, you must not be pregnant or seek pregnancy in the next 4 months to participate in this study.

Other exclusion criteria will be: recent surgery, cardiovascular disease (especially coronary disease, heart valve disease, heart failure, complex ventricular arrhythmias), kidney, liver, endocrine (other than pre-diabetes), respiratory or neuromuscular diseases.

Preliminary / final tests. Before starting the study, a medical history with exploration will be taken, and you will be asked to undergo a sub-maximal and a MAXIMUM stress test, pedaling on a cycle ergometer. At rest and during exercise we measure the response of your heart using an electrocardiograph (in case you have not had this measurement from you in the last 12 months) to rule out abnormalities of the heart or other components of the cardiovascular system. In addition, during the test part of the air you exhale will be collected to calculate your

oxygen consumption and your maximum aerobic capacity. All these procedures will be performed by the sports medicine doctor of the research team.

Analytics. On the day of the preliminary / final test, you will be given a flyer to go to a clinical laboratory on an empty stomach for an extraction (approximately 10 cc of venous blood). You must allow at least 24 hours between the preliminary / final maximal effort test and the analytical one.

Physical Training: You will undertake to attend training sessions for 3-4 months at the university facilities on the Arms Factory campus. The exercise will be performed under the supervision of a sports science graduate and will be performed on an exercise bike. The training program will consist of 3 weekly sessions for 4 months of intense aerobic exercise. The workload will increase as training adaptations occur. At each exercise session, your heart rate will be measured. Your maximum heart rate and weight will be measured every 2 weeks.

Experiment Tests: Depending on the type of medicine you take, you will be asked to go to the laboratory in the morning (7-9 am), without having had breakfast or having trained during the previous 2 days on 4 occasions. These tests are different in that you will be in each of the following situations:

a) CONTROL. Participants refrain from exercising 48 hours before the test and from taking their medication 72 hours before the test.

b) TRAINED. Participants abstain from taking their medication 72 hours before the test and do an exercise session in the lab.

c) MEDICATION. Participants refrain from exercise 48 hours before the test but take their usual dose of medication.

d) TRAINED + MEDICATION. Participants take their usual medication before the test and do an exercise session in the laboratory.

Measurements in each test.

Estimation of body composition. It will be weighed naked and carved. Next, the waist circumference will be measured. The amount of body fat will also be calculated with a device that circulates through your body a weak electrical current that you will not feel (electrical bioimpedance).

Rest measurements. After these measurements, you will lie on a table, an elastic band will be placed around your chest to measure your heart rate, and a pressure cuff. Next, on the other arm, we will place a cuff that will be inflated to measure your systolic and diastolic pressure 3 times. Depending on the medication you take, (antihypertensive, hypoglycemic, statins) you will be given one of the following techniques. Measurement of your resting metabolism, by analyzing the exhaled air for 30 minutes. A non-invasive measurement of the speed of blood flow in your body called cardiac output. The ability of the cutaneous veins in the skin of your forearm to dilate and their production of nitric oxide in the blood. Auscultation of the femoral artery in the groin and the carotid artery in the neck to measure the shape and velocity of pressure waves at these locations.

Intravenous glucose tolerance test, infusion of glucose tracers to calculate your body's rate of glucose production. Placement of a transterminal sensor that will

measure glucose concentration on an outpatient basis.

Placement of a pressure cuff to measure blood pressure for 24 hours on an outpatient basis.

Measurements during exercise. Depending on what medication you take (antihypertensive, hypoglycemic, statins) some of the measurements described will be performed during rest.

Risks and discomforts. There is a risk of developing a small hematoma (effusion) where the blood is drawn on the arm. This risk is reduced by applying pressure for 10 minutes after removing the needle. There is a risk of infection, which is minimized with the sterile procedures that we follow and general care of the puncture that will be indicated. Some people get dizzy during arm skin punctures, but the risk of an accident due to dizziness is reduced by performing the puncture with you lying on the table. During the 3 minutes of occlusion of the flow to the forearm, you may feel your fingers tingle. This occlusion time is not long enough to create problems due to lack of irrigation and this sensation disappears after a few minutes.

At the end of the MAXIMUM stress test you may feel fatigued. In rare cases, dizziness, gastrointestinal disorders and even (in people with undiagnosed heart disease) sudden death may be experienced after exertion. If you notice dizziness, shortness of breath or sudden pain during this test or the others in this study, you should tell us immediately.

INFORMED CONSENT SHEET

NAME AND SURNAME

Date of Birth DNI

Address

Telephone contact

NAME PRINCIPAL INVESTIGATOR RICARDO MORA RODRÍGUEZ
Exercise Physiology Laboratory. Castilla-La Mancha university. Toledo

I have read the project information sheet and have had the opportunity to discuss the details with the principal investigator and ask him any questions. The person in charge of the project has explained to me the purpose of the tests that are going to be carried out and I have fully understood everything that has been explained to me.

I agree to take part in this study and understand that I am completely free to abandon it at any time I wish or refuse to perform any of the measurement procedures.

I understand that the tests carried out are part of a research project that will not bring me any personal profit, but that participation is voluntary. The results of this study are intended to promote knowledge in Biomedical Sciences and I understand that the procedures described have been approved by a clinical research ethics committee.

I fully and freely consent to participate in the project entitled: INTERACTIONS BETWEEN PHYSICAL TRAINING AND MEDICATION IN PATIENTS WITH METABOLIC SYNDROME

Volunteer's Signature_____ ____

Place and date

I confirm that I have explained to the volunteer (named above) the purpose and risks of the tests to be carried out.

Investigator's Signature_____ ____

Place and date___Toledo,