

# Exercise Training in Chronic Kidney Disease

<b>Submission date</b> 14/01/2014	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
<b>Registration date</b> 21/02/2014	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 09/08/2019	<b>Condition category</b> Urological and Genital Diseases	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Kidney disease is increasingly common and now affects about 8% of the population. When the kidneys don't work properly, patients often suffer from a number of problems, including muscle weakness, extreme tiredness and increased risk of developing heart disease. Our research has shown that the muscles can be improved by regular muscle building exercise, and walking (aerobic) exercise can help to keep the heart healthy. The aim of this study is to find out whether a combination of muscle-building exercise and aerobic exercise can provide benefits to both the muscles and the heart in people with kidney disease.

### Who can participate?

Adults aged 18 and over with a chronic kidney disease (Stages 3b-5) and living in the Leicestershire area.

### What does the study involve?

Participants will attend the hospital for some tests to measure their fitness and their current health, including Magnetic Resonance Imaging (MRI) Ultrasound scans of the leg muscles, a heart function test, a blood sample and some questionnaires. Participants will then wear a small wrist device for one week to measure their usual activity levels. For the next six weeks, participants will carry on with their usual daily lives, after which they will return to the hospital to repeat the same tests as before. The participants will then start a 12-week course of supervised exercise classes for about 1 hour, three times a week. Participants will be randomly allocated to either just do aerobic-type exercises such as walking and cycling or to do a mixture of aerobic exercises and leg muscle-building strength exercises with weights. Before the first exercise class, participants will have a small muscle biopsy (sample) taken from the thigh muscle, and this will be repeated the following day after the exercise session. At the end of the 12-week course of exercise classes, the participants will return for another set of health and fitness tests and another muscle biopsy. The results will tell us about how aerobic and muscle-building exercise affects kidney patients, and will help us to advise people with kidney disease about the best types of exercise for them.

### What are the possible benefits and risks of participating?

There are no direct benefits of taking part in this study, although we hope that the participants will get fitter by taking part in the exercise classes. Ultimately, taking part in the study will help to provide better care for kidney patients in the future. Any clinically important results will be

passed on to the patients own GP (doctor). As with all physical activity, there is a very small risk of accident or injury during the exercise tests and classes, but all exercise will be supervised by specialist research staff and will take place on hospital premises with resuscitation equipment available and trained staff on hand. Taking blood samples from the arm may cause slight pain or bruising afterwards. For the muscle biopsies, the patient will be given an injection of local anaesthetic, which may cause some slight discomfort. The biopsy itself is not painful, but the area may ache for a while afterwards. There is a very low risk of infection or bleeding at the site of the biopsy.

Where is the study run from?

The study will be run at Leicester General Hospital. The MRI and ultrasound scans will be done at the Glenfield Hospital in Leicester, UK.

When is the study starting and how long is it expected to run for?

The study started in December 2013. Recruitment of kidney patients to take part in the study is expected to continue for about 3 years. After this, blood and muscle samples will be analysed in the laboratory for another 2 years. We expect the study to be completed by December 2018.

Who is funding the study?

Leicester-Loughborough Nutrition, Diet and Lifestyle Biomedical Research Unit, UK.

Who is the main contact for the study?

Dr Alice Smith  
Aa50@le.ac.uk

## Contact information

### Type(s)

Scientific

### Contact name

Dr Alice C Smith

### Contact details

Leicester Kidney Exercise Team  
University of Leicester Academic Unit  
Leicester General Hospital  
Leicester  
United Kingdom  
LE5 4PW  
-  
aa50@le.ac.uk

## Additional identifiers

### ClinicalTrials.gov (NCT)

NCT01061008

### Protocol serial number

Protocol version 1 dated 1st August 2013

# Study information

## Scientific Title

Exercise Training in Chronic Kidney Disease

## Acronym

ExTra CKD

## Study objectives

This study is designed to determine if delivering aerobic and resistance exercise together in a pragmatic rehabilitation programme can replicate the benefits seen when these forms of exercise were previously investigated separately, or if when combined the two modes of exercise interfere with each other and no benefit is received.

We hypothesise that a 12-week course of thrice-weekly supervised exercise classes comprising a combination of cardiovascular and resistance exercise will significantly improve muscle strength, mass and metabolism compared with cardiovascular exercise alone in patients with advanced pre-dialysis kidney disease.

## Ethics approval required

Old ethics approval format

## Ethics approval(s)

NRES Committee East Midlands - Northampton, 22/10/2013, ref 13/EM/0344

## Study design

Randomised study

## Primary study design

Interventional

## Study type(s)

Treatment

## Health condition(s) or problem(s) studied

Chronic kidney disease

## Interventions

Randomised study of supervised cardiovascular exercise versus supervised cardiovascular plus resistance exercise, with a 6 week usual activity run-in period for all participants.

12 week course of supervised exercise classes, duration approximately 1 hour, 3 times a week, consisting of either cardiovascular exercises alone or a combination of cardiovascular and lower body resistance exercises. Exercise intensity will be tailored to the individual and progressed through the 12 week course as individually appropriate.

## Intervention Type

Behavioural

## Primary outcome(s)

Muscle strength (total weight lifted during training sessions and estimated 1 repetition maximum of quadriceps extension) measured at 6 weeks, 12 weeks, 18 weeks

### **Key secondary outcome(s)**

1. Quadriceps Muscle size: Magnetic Resonance Imaging & 3D Ultrasonography. Measured at baseline, 6 weeks, 18 weeks
2. Exercise Capacity: VO<sub>2</sub>peak. Measured at baseline, 6 weeks, 18 weeks
3. Physical Function: Shuttle walk tests; sit to stand tests. Measured at baseline, 6 weeks, 12 weeks, 18 weeks
4. Daily Physical Activity: 7 day Accelerometry. Measured at baseline, 6 weeks, 18 weeks
5. Body composition: Weight, height, waist circumference. Measured at baseline, 6 weeks, 12 weeks, 18 weeks
6. Arterial Stiffness: Pulse Wave Velocity. Measured at baseline, 6 weeks, 18 weeks
7. Clinical parameters: Extracted from medical records. Measured at baseline, 6 weeks, 18 weeks
8. Muscle metabolism: Muscle biopsy. Measured at 6 weeks, 18 weeks
9. Plasma markers of inflammation and oxidative stress, Venous blood sample. Measured at baseline, 6 weeks, 18 weeks
10. Quality of Life: SF36 and EQ5D questionnaires. Measured at baseline, 6 weeks, 12 weeks, 18 weeks
11. Symptom perception: Chronic Kidney Disease Symptom Score. Measured at baseline, 6 weeks, 12 weeks, 18 weeks
12. Physical Activity habits and attitudes: Leicester Kidney Patient Physical Activity Questionnaire (comprising Duke Activity Status Index; GP Physical Activity Questionnaire; Leisure Time Exercise Questionnaire; Stage of Change Questionnaire; Self Efficacy Questionnaire). Measured at baseline, 6 weeks, 12 weeks, 18 weeks
13. Fatigue: FACIT-Fatigue Questionnaire & Visual Analogue Scale. Measured at baseline, 6 weeks, 12 weeks, 18 weeks
14. Appetite: Visual Analogue Scale. Measured at baseline, 6 weeks, 12 weeks, 18 weeks

### **Completion date**

01/12/2018

## **Eligibility**

### **Key inclusion criteria**

1. Male and female aged between 18 and 100 years
2. Established Chronic kidney disease (Stages 3b-5)
3. Attending Nephrology outpatient clinics in the Leicester region

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

**Sex**

All

**Total final enrolment**

41

**Key exclusion criteria**

1. Age <18 years
2. Unfit for the exercise programme due to physical impairment and significant co-morbidity (unstable hypertension, potentially lethal arrhythmia, myocardial infarction within previous 6 months, unstable angina, active liver disease, uncontrolled diabetes mellitus (HbA1c >9%), advanced cerebral or peripheral vascular disease)
3. Insufficient command of English to give informed consent or comply with the testing and training protocol. If the results indicate that the intervention is useful, future larger studies will include provision for those whose first language is not English.
4. BMI > 40 with waist circumference >102cm for males and >88 for females. Two measures of obesity have been included here to allow for the inclusion of individuals with a high BMI due to a larger muscle mass, as BMI is unable to discriminate between fat mass and fat free mass.

**Date of first enrolment**

02/12/2013

**Date of final enrolment**

01/12/2016

**Locations****Countries of recruitment**

United Kingdom

England

**Study participating centre**

**Leicester General Hospital**

Leicester

United Kingdom

LE5 4PW

**Sponsor information****Organisation**

University Hospitals of Leicester (UK)

**ROR**

<https://ror.org/02fha3693>

# Funder(s)

## Funder type

Government

## Funder Name

Leicester-Loughborough Nutrition, Diet and Lifestyle Biomedical Research Unit (National Institute of Health Research) (UK)

# Results and Publications

## Individual participant data (IPD) sharing plan

### IPD sharing plan summary

Not provided at time of registration

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	01/06/2018	08/05/2019	Yes	No
<a href="#">Basic results</a>			09/08/2019	No	No
<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Other publications</a>	secondary analysis	01/02/2019	08/05/2019	Yes	No
<a href="#">Other publications</a>	secondary analysis	01/08/2019	08/05/2019	Yes	No