

# In-centre extended nocturnal haemodialysis: the effects on cardiovascular structure and physical function

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<b>Registration date</b> 27/07/2015	<b>Overall study status</b> Completed	<input checked="" type="checkbox"/> Protocol
<b>Last Edited</b> 18/08/2023	<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

Patients with established renal failure usually undergo haemodialysis for four hours, three times a week, in purpose-built units. This regime tends to place large strain on the heart and body. This strain can result in a number of different symptoms including dizziness, cramps and breathlessness. Haemodialysis itself causes the heart to enlarge and not work properly. In addition to this, most patients on dialysis are known to have very sedentary lifestyles due to the time commitments of their treatment, the nature of renal disease and related illnesses.

Extending dialysis sessions has been shown as one way of reducing the symptoms patients' experience. This also reduces the strain on the patient's heart and may improve heart health.

One potential way to provide longer sessions is to conduct the haemodialysis sessions overnight and this has the added benefit of freeing up time during the day. Currently the Leicester General Hospital is the only NHS centre in the UK to offer nocturnal haemodialysis sessions, in a hospital setting.

Some previous research by other groups has looked at how receiving dialysis overnight in dialysis units affects the heart. However they have not used the gold standard imaging techniques. Furthermore, no one has yet looked at the effects of nocturnal dialysis on physical function and activity levels. The aim of the study is to compare a thrice weekly in-centre nocturnal regime to the conventional four hour thrice weekly regime.

This exploratory study will use cardiac magnetic resonance imaging (the gold standard technique) to look at how nocturnal dialysis affects the heart. Additionally, we will use simple, validated methods to assess physical function and activity levels. We will collect data on body composition, nutrition, blood biochemistry and markers of inflammation, to look at associations between these results as well as with physical function and activity levels. We will also collect information on quality of life, sleep quality and symptom burden. All the outcomes collected will provide us with high quality or new information that will help in the design of larger studies in the future.

### Who can participate?

Adult patients on haemodialysis for more than three months.

What does the study involve?

There are two groups of participants: the intervention group and the control group. In the intervention group, participants interested in extended hours dialysis in a dialysis unit overnight will switch from conventional daytime treatment to extended treatment overnight. The control group will be made of participants on conventional day time treatment, who are matched to intervention patients and do not want to undergo extended treatment overnight.

What are the possible benefits and risks of participating?

Patients who receive extended treatment times in the overnight haemodialysis programme may expect to see improvements in their physical and psychological health. There are no other anticipated benefits to taking part in the research.

Where is the study run from?

Leicester General Hospital (UK)

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

September 2014 to July 2016

Who is funding the study?

Van Geest Heart and Cardiovascular Research Fund, Leicester (UK)

Who is the main contact?

Mr Darren Churchward

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## Contact information

### Type(s)

Public

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## Additional identifiers

### Protocol serial number

UNOLE 0528

## Study information

### Scientific Title

Maintenance In-centre nocturnal haemoDialysis: a feasibility study iNvestIGating the effects on cardiac structure and pHysical funcTion in comparison to conventional treatment

### Acronym

MIDNIGHT

### Study objectives

1. Cardiac structure and function, as measured by CMR and NICOM, will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.
2. Physical function, as measured by the short physical performance battery and sit-to-stand 60, will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.
3. The time spent physically active, as measured by accelerometry, will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.
4. Quality of life, as measured by validated questionnaires will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.
5. Body composition and nutritional status, as measured by bioelectrical impedance analysis and diet recall, will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.
6. Inflammatory and biochemical markers including, IL-6, IL-10, CRP, phosphate, calcium, and

other markers measured monthly, will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.

7. Dialysis efficacy will improve in haemodialysis patients who switch from a conventional four hour thrice weekly regime to a thrice weekly in-centre nocturnal regime compared to patients who remain on conventional four hour thrice weekly dialysis.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

NRES Committee East Midlands- Northampton, 09/07/2015, REC ref: 15/EM/0268

### **Study design**

Non-randomized controlled feasibility trial

### **Primary study design**

Interventional

### **Study type(s)**

Treatment

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

Topic: Renal disorders; Subtopic: Renal disorders; Disease: All Renal disorders

### **Interventions**

Intervention arm: Patients interested in extended hours dialysis in a dialysis unit overnight and consenting to participation in the trial will switch from conventional daytime treatment

Control arm: Patients on conventional day time treatment, who are matched to intervention patients and do not want to undergo extended treatment overnight, will be recruited.

### **Intervention Type**

Other

### **Primary outcome(s)**

As this is a feasibility study designed to inform future trial development, no single primary outcome will be selected. All outcomes collected are listed below:

1. Left ventricular mass in grams (using cardiac MR)
2. Cardiac output and other haemodynamic variables measured using the noninvasive cardiac output monitor (NICOM)
3. Physical performance, specifically gait speed, balance, muscular power and muscular endurance, as assessed by the short physical performance battery and the sit-to-stand 60 tests.
4. Habitual activity levels as assessed by accelerometry
5. Quality of life and perceived physical function assessed using short form 12 questionnaire, palliative outcome scale-symptoms renal questionnaire, Pittsburgh sleep quality index questionnaire, functional assessment of chronic illness treatment fatigue questionnaire, Leicester dialysis patient physical activity questionnaire.
6. Diet quality assessed by either dietary recall interview or food diary
7. Markers of malnutrition, inflammation, cardiovascular dysfunction and cardiovascular risk assessed by analysis of blood sample

8. Body composition (including lean tissue, fat tissue, fluid overload, body cell mass) assessed by bioimpedance spectroscopy (using body composition monitor)

**Key secondary outcome(s)**

Please see Primary outcome measures section.

**Completion date**

31/07/2016

## **Eligibility**

**Key inclusion criteria**

1. Be a prevalent haemodialysis patient for more than three months
2. Age 18 years or older
3. Able and willing to give informed consent

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 years

**Sex**

All

**Key exclusion criteria**

1. Unable to undergo CMR scanning (metal implants / prostheses, claustrophobia etc.)
2. Age <18 years
3. Unable or unwilling to give informed consent

**Date of first enrolment**

20/07/2015

**Date of final enrolment**

01/04/2016

## **Locations**

**Countries of recruitment**

United Kingdom

England

**Study participating centre**  
**University of Leicester**  
Department of Infection, Immunity and Inflammation  
Maurice Shock Medical Sciences Building  
University Road  
Leicester  
United Kingdom  
LE1 9HN

## Sponsor information

**Organisation**  
University of Leicester

**ROR**  
<https://ror.org/04h699437>

## Funder(s)

**Funder type**  
Charity

**Funder Name**  
Van Geest Heart and Cardiovascular Research Fund

## Results and Publications

### Individual participant data (IPD) sharing plan

**IPD sharing plan summary**  
Available on request

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>		31/10/2017	18/08/2023	Yes	No
<a href="#">Protocol article</a>	results	08/09/2016		Yes	No
<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes