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Establishing a life course cohort for advances in the prevention, diagnosis and treatment of sarcopenia

Submission date
26/11/2018

Recruitment status
No longer recruiting

Registration date
12/03/2019

Overall study status
Ongoing

Last Edited
02/05/2025

Condition category
Musculoskeletal Diseases

[ ] Prospectively registered
[X] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Loss of muscle mass and muscle strength (known as sarcopenia) occurs as people get older. This can lead to loss of independence and reduced quality of life. The aim of this study is to find out about the role of muscle health in people from mid-life onwards. The information from this research could increase our understanding and help find ways to help people stay healthy, independent and active throughout their life.

Who can participate?
The researchers are interested in how muscle changes between ages 18 and 85, so people must be in this age range to take part. There are also some medical reasons why a person cannot take part, including being on blood-thinning medication (such as warfarin), being on medication like steroid tablets and having diabetes.

What does the study involve?
The study is made up of a home visit followed by two clinic visits to the Clinical Ageing Research Unit (CARU) in the Campus for Ageing and Vitality which is based at the site of the former Newcastle General Hospital. The home visit involves a broad range of questions, covering working life, day to day life and health. The two clinic visits are usually a week apart. They include tests of grip strength and balance; a scan of bone and muscle called a DEXA scan which uses a low-dose of x-rays; collecting a small tissue sample (a biopsy) of one of the thigh muscles; a fasting blood test and use of a special set of scales to measure muscle (called bioimpedance scales).

What are the possible benefits and risks of participating?
While there are no immediate benefits in taking part in this study to participants personally, the information gained may improve what is known about muscle health and the effect on staying healthy and independent throughout our lives. It is also hoped that participants will enjoy taking part. The muscle biopsy will be taken after the skin and surrounding area is numbed by injecting local anaesthetic. The injection and biopsy may cause some minor discomfort and bruising after biopsy and may be uncomfortable for a few days. Muscle biopsy is a simple procedure removing

only a small amount of muscle with a low risk of complications. In very rare cases permanent muscle weakness, infection or a patch of numbness might occur.

Where is the study run from?
NIHR Newcastle Biomedical Research Centre (UK)

When is the study starting and how long is it expected to run for?
Recruitment: June 2018 to September 2024; Follow-up: May 2025 to March 2028

Who is funding the study?
NIHR Newcastle Biomedical Research Centre (UK)

Who is the main contact?
Study PI: Prof Miles Witham
Miles.witham@newcastle.ac.uk

Contact information

Type(s)
Principal investigator

Contact name
Prof Miles Witham

ORCID ID
https://orcid.org/0000-0002-1967-0990

Contact details
3rd Floor Biomedical Research Building
Campus for Ageing and Vitality
Newcastle University
Newcastle upon Tyne
United Kingdom
NE4 5PL
+44 (0)191 208 1317
Miles.witham@newcastle.ac.uk

Type(s)
Scientific

Contact name
Prof Miles Witham

Contact details
3rd Floor Biomedical Research Building
Campus for Ageing and Vitality
Newcastle University
Newcastle upon Tyne
United Kingdom

NE4 5PL
+44 (0)191 208 1317
Miles.witham@newcastle.ac.uk

Type(s)
Public

Contact name
Prof Miles Witham

Contact details
3rd Floor Biomedical Research Building
Campus for Ageing and Vitality
Newcastle University
Newcastle upon Tyne
United Kingdom
NE4 5PL
+44 (0)191 208 1317
Miles.witham@newcastle.ac.uk

Additional identifiers

Integrated Research Application System (IRAS)
246888

Protocol serial number
39042

Study information

Scientific Title
MASS_Lifecourse: establishing a life course cohort for advances in the prevention, diagnosis and treatment of sarcopenia

Acronym
MASS Lifecourse (Muscle Ageing and Sarcopenia Study Lifecourse)

Study objectives
There is considerable interest in understanding what causes sarcopenia in order to develop new approaches to prevention, diagnosis and treatment. To gain a detailed understanding of sarcopenia across a range of ages, we have designed the Muscle Ageing Sarcopenia Study (MASS_Lifecourse) in collaboration with members of the public and patients.

The aims of the study:
1. To determine if it is acceptable and feasible to recruit adults across a range of ages to undergo detailed studies of skeletal muscle including biopsy
2. To understand how lifestyle is related to the characteristics of muscle
3. To use advances in technology (an omics approach) to identify mechanisms of sarcopenia and biomarkers for early diagnosis
4. To use findings from 2 and 3 to develop new approaches to treatment and also to invite

participants to relevant trials
5. To secure funding for maintaining and expanding the cohort

Ethics approval required
Old ethics approval format

Ethics approval(s)
North East – Newcastle & North Tyneside 1 Research Ethics Committee, 10/08/2018, REC ref:18/NE/0220

Primary study design
Observational

Study design
Observational; Design type: Longitudinal

Study type(s)
Diagnostic

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

Interventions
Current interventions as of 02/05/2025:

1. Sample and recruitment
The aim was to recruit 260 participants (with a roughly even split between women and men) aged 18 to 85 years of age. Participants will be recruited from primary care, secondary care and the NIHR Bioresource Centre Newcastle cohort.

For primary care, this will be from GP surgeries which act as participant identification centres in the North East and North Cumbria Clinical Research Network. The relevant GP surgeries will be asked to identify patients who meet the study inclusion and exclusion criteria, before posting a recruitment pack (participant information sheet, letter from GP in support of the study, reply slip and pre-paid envelope) to potential participants. For secondary care, those meeting the study criteria and attending Newcastle upon Tyne Hospitals NHS Foundation Trust (NuTH) clinics, such as the Metabolic Bone Clinic at the Freeman Hospital, will also be eligible and will be provided with a recruitment pack by the clinician. For NIHR Bioresource Centre Newcastle, the Bioresource team will post the study recruitment pack to those meeting the eligibility criteria (and only those who have not already had four study invitations in the past year).

Those expressing an interest in participating (via completion and return of a reply slip provided within the recruitment pack from GP [primary care], NuTH clinician [secondary care] or NIHR Bioresource) will then be contacted by phone by the lead researcher. This will be an opportunity to confirm the inclusion and exclusion criteria, as well as answering any questions about the study. The next step for those who remain eligible and interested in taking part will be a home visit.

2. Home visit (week 1)
The initial consent will be obtained by an appropriately trained researcher as part of the home visit. The notion of process consent will be adopted throughout this study and at each active

research phase carried out with the participant. This means that endurance of consent will be verified at each contact and prior to any of the research procedures (namely at DEXA and muscle biopsy).

The home visit will comprise assessment of demographics, medical conditions and questions related to sarcopenia, frailty, quality of life, disability, mood, social support and tests of memory /reasoning. The trialists will also complete measures of muscle function such as grip strength and how quickly participants can stand from a chair and sit down several times. At the end of the visit, participants will be given a water-resistant wrist-worn activity monitor to wear to measure physical activity for one week.

3. First clinic-based assessment (week 2/3)
The trialists will arrange private transport, or reimburse reasonable travelling expenses, in order for participants to reach the Clinical Aging Research Unit (CARU) in the Campus for Ageing and Vitality at a prearranged date and time. The trialists will make participants aware that a family member, friend or carer can accompany them if they wish. This assessment will cover removal (or collection if already removed) of the physical activity monitor, DEXA scan to assess muscle mass, biopsies of muscle, and lunch for the participant (and family member, if required). As biopsy of muscle is included in this visit avoiding Friday clinic appointments. This would ensure participants are not being left over the weekend without an immediate point of contact should they have any concerns after biopsy.

The DEXA scan will take around 20 minutes and involves exposure to a very small amount of ionising radiation. The chance of a person developing cancer as a result of this exposure is extremely small.

For the biopsy of the vastus lateralis (one of the muscles on the front of the thigh), participants will first be checked again for any contraindications to biopsy. Where a participant takes aspirin, it will be confirmed that this has been stopped for at least 14 days prior to the procedure. They will then undergo a muscle biopsy under aseptic conditions and using a local anaesthetic. The wound from the biopsy site is closed with small adhesive strips. The samples collected will be used to determine the expression of different genes in skeletal muscle and a portion also frozen for future analyses.

There is no need to fast before the muscle biopsy procedure. The trialists will aim to complete the biopsy before 1pm to allow the observation period to be complete by a convenient time. This clinical procedure will last 30 minutes after which participants will be observed for 2 hours (as previously described).

A key clinical member of the research team will telephone participants within two days post biopsy to check that they do not have any concerns about the biopsy site.

4. Second clinic-based assessment (week 3/4)
The trialists will arrange for a second visit to the CARU, again with transport provided or costs reimbursed. Participants will undergo the collection of fasting bloods and bioimpedance assessment of body composition. Breakfast will then be provided for the participant. An assessment will be made of the wound healing process. Blood pressure will be checked. Feedback will be sought from the participant about the study. The trialists will also check whether each participant is happy to be contacted regarding future studies.

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Previous interventions:

1. Sample and recruitment
The aim is to recruit 160 participants (with a roughly even split between women and men) aged 45 to 85 years of age and divided equally across the age range. Participants will be recruited from primary care, secondary care and the NIHR Bioresource Centre Newcastle cohort.

For primary care, this will be from GP surgeries which act as participant identification centres in the North East and North Cumbria Clinical Research Network. The relevant GP surgeries will be asked to identify patients who meet the study inclusion and exclusion criteria, before posting a recruitment pack (participant information sheet, letter from GP in support of the study, reply slip and pre-paid envelope) to potential participants. For secondary care, those meeting the study criteria and attending Newcastle upon Tyne Hospitals NHS Foundation Trust (NuTH) clinics, such as the Metabolic Bone Clinic at the Freeman Hospital, will also be eligible and will be provided with a recruitment pack by the clinician. For NIHR Bioresource Centre Newcastle, the Bioresource team will post the study recruitment pack to those meeting the eligibility criteria (and only those who have not already had four study invitations in the past year).

Those expressing an interest in participating (via completion and return of a reply slip provided within the recruitment pack from GP [primary care], NuTH clinician [secondary care] or NIHR Bioresource) will then be contacted by phone by the lead researcher. This will be an opportunity to confirm the inclusion and exclusion criteria, as well as answering any questions about the study. The next step for those who remain eligible and interested in taking part will be a home visit.

2. Home visit (week 1)
The initial consent will be obtained by an appropriately trained researcher as part of the home visit. The notion of process consent will be adopted throughout this study and at each active research phase carried out with the participant. This means that endurance of consent will be verified at each contact and prior to any of the research procedures (namely at DEXA and muscle biopsy).

The home visit will comprise assessment of demographics, medical conditions and questions related to sarcopenia, frailty, quality of life, disability, mood, social support and tests of memory /reasoning. The trialists will also complete measures of muscle function such as grip strength and how quickly participants can stand from a chair and sit down several times. At the end of the visit, participants will be given a water-resistant wrist-worn activity monitor to wear to measure physical activity for one week.

3. First clinic-based assessment (week 2/3)
The trialists will arrange private transport, or reimburse reasonable travelling expenses, in order for participants to reach the Clinical Aging Research Unit (CARU) in the Campus for Ageing and Vitality at a prearranged date and time. The trialists will make participants aware that a family member, friend or carer can accompany them if they wish. This assessment will cover removal (or collection if already removed) of the physical activity monitor, DEXA scan to assess muscle mass, biopsies of muscle, and lunch for the participant (and family member, if required). As biopsy of muscle is included in this visit avoiding Friday clinic appointments. This would ensure participants are not being left over the weekend without an immediate point of contact should they have any concerns after biopsy.

The DEXA scan will take around 20 minutes and involves exposure to a very small amount of ionising radiation. The chance of a person developing cancer as a result of this exposure is extremely small.

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There is no need to fast before the muscle biopsy procedure. The trialists will aim to complete the biopsy before 1pm to allow the observation period to be complete by a convenient time. This clinical procedure will last 30 minutes after which participants will be observed for 2 hours (as previously described).

A key clinical member of the research team will telephone participants within two days post biopsy to check that they do not have any concerns about the biopsy site.

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Intervention Type
Other

Primary outcome(s)
Sarcopenia phenotype assessed using walking speed, grip strength, chair rise time, tests of standing balance and measurement muscle mass (using appendicular lean mass from DXA scan) at baseline

Key secondary outcome(s)
Physical and mental health assessed at baseline:
1. Presence of frailty, assessed using the Fried frailty and the electronic frailty index (EFI)
2. Cognitive and psychosocial function, assessed using standardised mini-mental state examination (SMMSE), Montreal Cognitive Assessment (MoCA), Geriatric Depression Scale (GDS) and Short Form 36 (SF-36) Health Survey Questionnaire
3. Lifestyle exposures, assessed using reduced Food Frequency Questionnaire, Rapid Assessment of Physical Activity questionnaire and objectively-measured physical activity levels over 7 days using a GeneActiv wrist-worn accelerometer (Activinsights, Cambridge, UK)
4. Endocrine markers (TFTs, IGF-1 and cortisol) assessed from blood sample
5. Muscle transcriptome assessed by RNA sequencing of biopsy sample of vastus lateralis muscle using a deep-phenotyping/omics approach

Completion date
31/03/2028

Eligibility

Key inclusion criteria
Current inclusion criteria as of 02/05/2025:

Primary care source:
Registered patient with one of the participating GP surgeries identified as PIC via North East and North Cumbria Clinical Research Network

Secondary care source:
Attending a NuTH clinical area

NIHR Bioresource:
Participants identified by the NIHR Bioresource Centre Newcastle as being eligible for the study and who have not previously expressed a wish to no longer be contacted about further studies

For all recruitment sources:
1. Has capacity to consent
2. Within the study age range (18-85 years)
3. Not taking any anticoagulant or antiplatelet medications (see below under exclusion criteria), with the exception of aspirin bei

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Previous inclusion criteria:

Primary care source:
Registered patient with one of the participating GP surgeries identified as PIC via North East and North Cumbria Clinical Research Network

Secondary care source:
Attending a NuTH clinical area

NIHR Bioresource:
Participants identified by the NIHR Bioresource Centre Newcastle as being eligible for the study and who have not previously expressed a wish to no longer be contacted about further studies

For all recruitment sources:
1. Has capacity to consent
2. Within the study age range (45-85 years)
3. Not taking any anticoagulant or antiplatelet medications (see below under exclusion criteria), with the exception of aspirin being taken for primary prevention (i.e. where there is no diagnosis of cardiovascular disease)

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group

Adult

Lower age limit
18 Years

Upper age limit
85 Years

Sex
All

Total final enrolment
260

Key exclusion criteria
1. Inability to give informed consent
2. As the study involves muscle biopsy, individuals who are taking medications that increase bleeding risk are excluded, specifically:
2.1. Anti-coagulant medication: warfarin, injected low-molecular weight heparins such as dalteparin, and direct oral anticoagulant drugs such as rivoxaban and apiaxaban
2.2. Anti-platelet medication such as clopidogrel or prasugrel. This also includes aspirin where an individual has a known history of cardiovascular disease. Aspirin being taken where there is no history of cardiovascular disease is acceptable, as we would consider there to be minimal risk of stopping the aspirin for 14 days prior to biopsies
3. Individuals known to have diabetes mellitus, due to the increased risk of infection at the biopsy sites
4. Individuals currently taking medication that suppresses the immune system (such as prednisolone or methotrexate), due to the increased risk of infection or poor healing of the biopsy sites
5. We appreciate it is unlikely in the age range of the participants, but nevertheless we would exclude anyone who was pregnant, due to the exposure to small amount of ionising radiation during the DEXA scan
6. Individuals who use a wheelchair or who are unable to walk without assistance, as we would anticipate that the muscle biopsy procedure would not be feasible in these groups
7. An individual who the NuTH clinician/GP feels it is inappropriate for the researchers to approach - the NuTH clinician/GP may consider an individual unsuitable for approach for reasons such as end stage terminal disease or safety risk

Date of first enrolment
09/10/2018

Date of final enrolment
30/09/2024

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Clinical Ageing Research Unit
Campus for Ageing and Vitality
Newcastle upon Tyne
United Kingdom
NE4 5PL

Sponsor information

Organisation
Newcastle upon Tyne Hospitals NHS Foundation Trust

ROR
https://ror.org/05p40t847

Funder(s)

Funder type
Government

Funder Name
NIHR Newcastle Biomedical Research Centre

Results and Publications

Individual participant data (IPD) sharing plan
The data sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		01/07/2022	01/09/2022	Yes	No
HRA research summary			20/09/2023	No	No