

Participation Information Sheet

Project title: Developing a clinically friendly method of measuring hip joint forces during physical exercises

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We would like to invite you to take part in our study. Before you decide whether to take part, we need you to understand what the study is about and what you would be doing if you agree to partake. Take your time to read this information sheet. If you have any questions, worries, problems or you would like more information about anything please do not hesitate to ask us.

Background of the research

Hip fractures commonly occur in older adults with poor bone strength, which can result in pain, reduce independence, and increase the risk of death. Weight-bearing exercise is often advised to promote the formation of new bone and improve bone strength. The amount of exercise required for new bone formation in the hip is unclear, given we cannot easily measure hip forces as traditional methods of measuring hip forces are very time-consuming.

What is the aim of the project?

The immediate aim is to develop a method to rapidly measure hip forces during exercise that will help clinicians monitor the appropriateness of an exercise.

How have I been selected?

You have been selected because you are a physically active adult, free from any medical conditions that would otherwise prevent you from vigorous exercise, and are within the age range of 18 to 70 years old.

Do I have to take part?

You do not have to take part if you don't want to, it is your choice as to whether you take part. If you want to talk to someone else about the study and ask their opinion before you decide you can. If you do decide to take part, we will ask you to sign the appropriate consent form. You have the right to drop out of the study at any time without explaining why.

Why might you not be able to take part in the study?

You will not be eligible to participate in this study if you have:

- Existing joint disease and metabolic, neurological, respiratory, or cardiovascular disorders
- A current pregnancy for female participants
- Currently experiencing musculoskeletal pain and those with a history of pain in the last 3 months
- Any history of lower limb joint replacement surgeries.

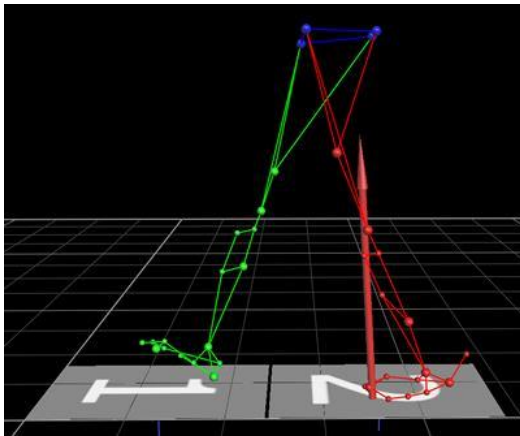
Vigorous physical activities would not be suitable for individuals, from a safety perspective, who fulfill any of the above criteria.

What will you be asked to do?

You will be required to attend one single session of testing, lasting approximately 2.5 hours, at the motion capture laboratory, within the University of Essex. During this period, the following will be undertaken:

1. Basic questionnaire of your physical activity levels (10 min)
2. Preparation to put on multiple sensors on your legs (30 min)
3. Warm-up (10 min)
4. Undergo low to vigorous short duration movement tasks: walking, running, jumping, hopping. These tasks are not continuous but are regularly interspersed with rest breaks. The aim of these tasks is not to tire you (1.5 hours). During these movements, we will collect movement data that looks like the image in Figure 1.
5. Cooldown and debrief (10 min)

Figure 1. Example of motion data collected



What if there is a problem?

If you have any problems, please do not hesitate to contact us. If it is a complaint or an issue regarding how you have been treated in the study, then it will be dealt with. See in more detail further on in this information sheet.

What precautions will you take to help protect me from the coronavirus?

First, the researcher will have performed a standard NHS COVID screening assessment over the telephone with you. Only participants who clear the screen on the day of assessment will be eligible to participate in the study. Second, only a maximum of three individuals will be in the laboratory at any one time, unless in instances of an emergency. Third, the researcher will have to wear face coverings. Fourth, strict hand hygiene practices will be maintained by the researcher. There will be hand sanitizers within the laboratory, and a washbasin is also present.

What can I do to help protect you from the coronavirus?

During the session, you will be asked to wear face coverings, unless during periods of physical exertion. You are encouraged to maintain hand hygiene practices before entering the laboratory, during the testing session. You should follow the most current government advice if you display any coronavirus symptoms following your visit. You should keep a copy of this information sheet, which contains the contact

details of the researcher and/or research team in case this information needs to be provided to the NHS Test & Trace service.

What are the possible benefits of this study?

There will be no direct personal benefit to you by participating in this study. However, information from this project will help in developing a crucial piece of clinical assessment technology, which would pave the way for the development of better treatments to improve bone health in older adults.

What if any relevant new information becomes available?

If any additional information becomes available, it will be conveyed to you through your chosen preferred method of communication.

What if I decide I don't want to carry on with the study?

If you decide at any time during the study that you no longer want to take part, you have the right to withdraw at any time, without giving any explanation as to why. Any data that has already been collected will continue to be used, however, no more data will be collected from you after you withdraw.

Who is funding and organizing the research?

This project is funded by The Academy of Medical Sciences, UK (<https://acmedsci.ac.uk/>).

How will data be used and stored?

Electronic data will be safely stored on the University of Essex cloud service (Box), which is password-protected and is accessible only to the Research and Investigators mentioned in this information sheet. Hardcopy data will be safely stored in a locked cupboard within a locked office room. The cupboard can only be accessed by the researcher and primary supervisor. The motion capture data collected from the movement assessments, including information of age, height, weight, and Sex, that does not contain personally identifying information, will be uploaded into a public repository, such as Figshare (<https://figshare.com/>).

The data will be used for research purposes, the results of which will be disseminated via peer-review scientific articles and scientific conferences.

Will my data be kept confidential?

All data will be kept confidential and unique participant numbers (e.g. "subj_01") will be allocated instead of using your name on any electronic files and hardcopy files.

What if you are unhappy with the conduct of this study?

If you have any concerns about any aspect of the study or you have a complaint, in the first instance please contact the principal investigator of the project (Dr Bernard Liew), using the contact details provided. If you are still concerned, and you think your complaint has not been addressed to your satisfaction or you feel that you cannot approach the principal investigator, please contact the departmental Director of Research in the department responsible for this project (Professor Jo Jackson. E-mail: jo.jackson@essex.ac.uk). If you are still not satisfied, please contact the University's Research Governance and Planning Manager, Sarah Manning-Press (e-mail: sarahm@essex.ac.uk). All research is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests.

