PARTICIPANT INFORMATION SHEET
(Symptomatic Group)

Title of Study: A comparison of upper limb movement and coordination patterns in individuals with and without shoulder pain

University of Surrey Ref: FEPS 22-23 001 EGA.

PLEASE KEEP A COPY OF THIS INFORMATION SHEET FOR YOUR RECORDS

Section: Taking Part

Invitation Paragraph

We would like to invite you to participate in this research project. You are being invited to take part because you have expressed an interest in the study. Your participation is voluntary. This information sheet has been designed to give you details about the study and enable you to decide if you wish to participate or not. If you have any questions, you can contact us using the contact details at the end of this information sheet. This research is being conducted by Molly Hodges, who is currently studying for a PhD in the Centre for Biomedical Engineering at the University of Surrey.

What is the purpose of the study?

This study aims to enhance knowledge of upper limb movement, specifically how movement is coordinated. Shoulder pain can significantly impact on sufferers' lives and this research seeks to improve understanding of how shoulder pain effects movement patterns. Participants with shoulder pain will be compared to participants that are not experiencing pain. The project aims to use statistics and machine learning to classify different movement patterns.

Who is responsible for this study?

This study is the responsibility of Molly Hodges who is conducting it as part of a PhD at the University of Surrey. The primary supervisor for the project is Dr Matthew Oldfield. The supervisory team also includes Dr Aliah Shaheen from the University of Brunel and Dr Srdjan Cirovic from the University of Surrey.

Why have I been invited to take part?

You are invited to participate in this study because you have expressed an interest in receiving more information having seen our recruitment material. The study involves two groups of participants: individuals experiencing shoulder pain and individuals who are not currently experiencing shoulder pain. Each group has a different set of inclusion criteria that must be met. Please see below the criteria for each group. If you have any questions about the criteria or aren't sure whether you meet them, please contact Molly Hodges using the contact details provided.

Individuals not experiencing shoulder pain:

Inclusion Criteria:
- Individuals over 18 years of age
- Experienced no shoulder pain in the last year

Exclusion Criteria:
- Individuals with neuromusculoskeletal disorders of the Upper extremity or spine.
- Individuals experiencing pain in their upper extremity or spine
- Individuals with connective tissue disorders and systemic illnesses
- Individuals who have experienced a traumatic shoulder injury
- Individuals with a history of a fracture of the clavicle, scapula or humerus
- Individuals with a history of dislocation or separation of any shoulder complex joint.

Individuals experiencing shoulder pain

Inclusion criteria:
- Individuals over 18 years of age
- Currently experiencing shoulder pain and diagnosed with one of the following by a healthcare professional (e.g. physiotherapist or consultant):
    (a) Sub-acromial impingement Syndrome
    (b) Subacromial pain syndrome
    (c) Rotator cuff disease
    (d) Non-specific shoulder pain
    (e) Rotator cuff related shoulder pain

Exclusion criteria:
- Individuals diagnosed with frozen shoulder
- Individuals diagnosed with shoulder instability
- Individuals with shoulder pain diagnosed as originating from the spine and neck
- Individuals with neuromusculoskeletal disorders of the Upper extremity or spine.
- Individuals with connective tissue disorders and systemic illnesses
- Individuals who have experienced a traumatic shoulder injury
- Individuals with a history of a fracture of the clavicle, scapula or humerus
- Individuals with a history of dislocation or separation of any shoulder complex joint.

Do I have to take part?

Participation is voluntary and you do not have to take part. We will describe the study in this information sheet and will give you at least two days to read this before contacting you again. It is hoped that this will give you the opportunity to decide whether you wish to take part. Please contact us if there is anything that is not clear, if you have any questions, or need more information.

What will happen to me if I decide to take part?

If you decide to take part, you will be given this information sheet to keep and will be asked to sign

a consent form to confirm your agreement to participate. You will be given a copy of the consent form to keep. This process will occur on arrival to the University of Surrey (Stag Hill Campus) Human Movement Laboratory. Following the consent process, you will be asked to fill out questionnaires to determine hand dominance, pain level and shoulder function (handedness questionnaire, Visual Analogue Pain Score and Oxford Shoulder Score). You will also be asked a short series of questions about yourself, history of shoulder pain, injury and treatment, and participation in activities involving the upper limb. Once the forms and questionnaires have been completed, your height and weight will be measured. The researcher will take you through a process to prepare you for the experiment.

During this process reflective markers will be attached to the upper body parts with hypoallergenic tape. The markers must be attached to the skin and not over clothing, therefore participants will be asked to remove their shirt and female participants to wear clothing that exposes the shoulder and shoulder blade (for example a sports bra or a thinly strapped vest). If you have any questions or concerns about this, please contact us for more information. The laboratory is equipped with a 10-camera optical motion tracking system (and video cameras) that will track the movement of your upper body using the markers attached to your skin. The video collected will be used to help with processing the three-dimensional motion capture data, for example in identifying issues with markers and to help identify the start and end points of movements. These videos will not be shared beyond the research team and once three-dimensional motion capture data has been processed these videos will be deleted.

All electronic data collected (including video data) will be stored on a secure University server.

A desk and a stool will be provided, and you will perform the practical part of the experiment in a sitting position. Firstly, you will be asked to perform a few set-up trials including holding the arms still and rotating your arm from the shoulder in multiple directions. These will be demonstrated to you by the researcher. Once the set-up tasks are complete you will be guided through six tasks, three range of motion (Abduction, Flexion and Extension), and three Activities of Daily Living (reaching for an object on a shelf, combing hair and reaching your hand to a back pocket). Each of the six tasks will be demonstrated by the researcher and you will practice them once before repeating each movement five times. You will receive a five-minute break between the two sets of three tasks. If at any point you do not wish to complete a task because of pain or any other reason you will be able to stop. If you have shoulder pain, you will perform the tasks with your symptomatic arm only. If you do not have shoulder pain, you will perform the tasks with both arms. The total time you will be required to spend in the Human movement Laboratory is estimated to be approximately 1.5 hours.

What happens if I do not want to take part or if I change my mind?

You are free to withdraw your data from the study up to 30 days after you study visit, without giving a reason. After this it will not be possible to withdraw research data that has been deidentified. There will be no adverse consequences in terms of your legal rights, that is, there will be no impact if you decide not to participate or withdraw at a later stage. To withdraw you should contact the chief investigator (Molly Hodges) or the principal PhD supervisor (Matthew Oldfield). Contact details for these individuals can be found towards the end of this information sheet.

What happens to my data if I want to withdraw?

If you withdraw consent, no further data would be collected. You can withdraw your personal data from the study at any time. To withdraw your personal data, you should contact the chief investigator (Molly Hodges) or the principal PhD supervisor (Dr Matthew Oldfield). It will not be possible to withdraw research data that has been anonymized. However, you will be able to withdraw any data up to 30 days after your visit.

What are the possible benefits in taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will improve the understanding of movement and coordination in the upper limb. It will also contribute to advancements in knowledge relating to shoulder pain, identifying differences between symptomatic and asymptomatic individuals. If you are interested, a summary of the study findings can be sent to you. Please contact the research team to arrange this. Please contact the research team to receive the results and be aware that the study will take over a year to complete and write up.

Are there any potential risks involved?

The tasks you will be asked to complete are everyday activities and should you experience any discomfort you will always be able to stop. If you experience new pain during the test please consider consulting your GP. If you do experience new pain, data collection will be stopped.

The cameras used during data collection give off high levels of infra-red light. Consequently, you should avoid staring directly into them. These cameras are on a gantry and will be out of your line of site. Removing the markers could cause mild discomfort, however, you will be able to remove these yourself if you wish. A risk assessment has been conducted for the area where the experiment is taking place and the experiment itself. If you are unhappy with any of the conditions, you are free to stop the experiment until any issue is resolved. The government and university guidelines in relation to Covid-19 will be followed at the time of each visit.

How is the project being funded?

This research is a student project forming part of a PhD. The studentship is being funded by the National Institute of Health Research Applied Research Collaboration Kent, Surrey and Sussex (ARC KSS) and forms part of a co-funding agreement between the ARC KSS and the University of Surrey.

Will my participation be kept confidential?

We are responsible for making sure your participation is kept confidential and any data is kept secure and used only in the way described in this information sheet. Your information may be reviewed for monitoring and audit purposes, by the University of Surrey and/or regulators who will treat your data in confidence. You will not be identified in any reports unless you have given permission for non-anonymised photographs and videos to be used during the informed consent process.

Will my data be shared or used in future research studies?

We would like your permission to use anonymised data in future research studies, and to share data with other researchers (e.g. in online databases/repositories). All personal information that could identify you will be removed before information is shared with other researchers or results are made public.

What will happen to the results of the study?

The results of the study will be published in scientific journals. They will also form part of a PhD thesis. Results may also be presented as part of conference presentations and other research outputs. You can contact the study team to find out the results of the research.

Who has reviewed this study?

This research has been reviewed by an independent group of people, called an Ethics Committee. This study was reviewed and given a favourable ethical opinion by the University of Surrey Ethics Committee.

Section: Your personal data

What is personal data?

'Personal Data' means any information that identifies you as an individual. We will be collecting and using some of your personal data that is relevant to completing the study and this section describes what that means.
The information that we will collect will include your name, contact details, height, weight, and video data which are regarded as 'personal data'. We will also collect health information about your shoulder which is regarded as 'special category personal data'. We will use this information as explained in the 'What is the purpose of the study' section above.

Who is handling my personal data?

The University of Surrey, who has the legal responsibility for managing the personal data in this study, will act as the 'Data Controller' for this study. The research team will process your personal data on behalf of the controller and is responsible for looking after your information and using it properly.

What will happen to my personal data?

As a publicly-funded organisation, we must only use i**dentifiable personal** information from people who have agreed to take part in research, and process this data fairly and lawfully. The University of Surrey processes personal data for the purposes of carrying out research in the **public interest**

and special category data is processed on an additional condition necessary for **research purposes.** This means that when you agree to take part in this research study, we will use and look after your data in the ways needed to achieve the outcomes of the study.

Your personal data will be held and processed in the strictest confidence, and in accordance with current data protection regulations. It is the University of Surrey Policy that research data that substantiates research findings or is of long term value should be preserved for a minimum of 10 years, project data (related to the administration of the project, e.g. participant's consent form) for at least 6 years. Personal data such as email adresses will be deleted as soon as data analysis is complete.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways or the research to be reliable and accurate. If you decide to withdraw from the study, we may not be able to withdraw your data. We will keep and use the minimum amount of your personally-identifiable information that we have already collected in order to complete the study.

If you wish to complain about how we have handled your personal data, you can contact our Data Protection Officer who will investigate the matter (dataprotection@surrey.ac.uk). If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful, you can contact the Information Commissioner's Office (ICO) (https://ico.org.uk/).

You can find out more about how we use your information https://www.surrey.ac.uk/information-management/data-protection and/or by contacting dataprotection@surrey.ac.uk .

Section: Further information

What if you have a query or something goes wrong?

If you are unsure about something you can contact the research team for further advice using the contact details at the bottom of this information sheet.

However, if your query has not been handled to your satisfaction, or if you are unhappy and wish to make a formal complaint to someone independent of the research team, then please contact:

Research Integrity and Governance Office (RIGO)
Research and Innovation Services
University of Surrey
Senate House, Guildford, Surrey, GU2 7XH
Email: rigo@surrey.ac.uk

The University has in place the relevant insurance policies which apply to this study. If you wish to complain or have concerns about how you have been treated during the course of this study, then you should follow the instructions given above.

Who should I contact for further information?

If you have any questions or require more information about this study, please contact the research team using the following contact details:

Chief Investigator: Molly Hodges, molly.hodges@surrey.ac.uk
Principal Supervisor: Matthew Oldfield, m.oldfield@surrey.ac.uk, 01483 684402

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Thank you for reading this information sheet and for considering taking part in this research.