Sheffield Teaching Hospitals NHS
NHS Foundation Trust

Dr K P S Nair
Consultant in Neurology
Sheffield Teaching Hospitals NHS Foundation Trust
Royal Hallamshire Hospital
SHEFFIELD
S10 2JF

Secretary: 0114 2712769
Email: siva.nair@nhs.net

Participant information sheet for persons with upper limb spasticity following a stroke to participate in a research study

Version 6

Study Title:	A new therapy for post-stroke arm spasticity: Sheffield Adaptive Patterned Electrical Stimulation (SHAPES) – a co-designed system improvement followed by a powered multi-arm randomised control trial
Short Title:	SHAPES
Study Sponsor	Sheffield Teaching Hospitals NHS Foundation Trust
Project Reference:	STH 20998
Ethical Panel Reference:	REC: 22/LO/0203
NIHR Reference:	The study is supported by project funding received by the National Institute for Health Research's 'Invention for Innovation' (i4i) Programme, Project Reference: NIHR201642
Chief Investigator:	Dr Sivaraman KP Nair**,** Consultant in Neurology

Introduction:

You are being invited to take part in a research study.
Before you decide it is important for you to understand why the research is being done and what it will involve. Please take the time to read this information sheet carefully. It provides the purpose of this study, what will happen to you during the study and risks and discomforts you may experience. The procedures will be explained to you by the research staff.

Please take the time to read the following information carefully and discuss it with friends, family and your GP if you wish to do so.

Ask the research staff if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to be involved.

1. What is the purpose of the study?

Following a stroke people often experience muscle stiffness (spasticity) in their arm. We want to understand if the addition of either of two forms of electrical stimulation to usual care adds any extra benefits. Transcutaneous Electrical Nerve Stimulation (TENS) and Sheffield Adaptive Patterned Electrical Stimulation (SHAPES) are two different techniques to stimulate sensory nerves using gentle electrical pulses. These techniques may be able to reduce muscle spasticity. The purpose of this study is to compare the effect of SHAPES and TENS on spasticity at the elbow alongside usual treatment.

2. What is the device that is being tested?

We have developed a small, lightweight 64-channel electrical stimulator (ShefStim APS) that is worn on the arm. Two pictures (figures 1 and 2) are shown on page 9. The stimulator allows us to stimulate many different areas of the arm at the same time. It can give 2 forms of stimulation: TENS and SHAPES. We have trialled these previously in two small studies; one study was done in hospital and one in people's homes. The study results showed promise and that it was feasible for stroke survivors to do the stimulation at home. We need a bigger study with more participants to know whether it will help to reduce arm spasticity in addition to usual treatments. We also want to know how long the effects of TENS or SHAPES stimulation might last, and whether one lasts longer than the other.

3. Why have I been chosen?

We are inviting you to participate in this research as your medical records show that you had a stroke which affected your arm. You cannot take part in the study if you have any implanted electrical devices. Please tell the doctor treating you or one of the study team doctors if you do have such a device. You will not be able to take part if you are pregnant. If any of the restrictions listed apply to you, or if your situation changes, please inform Dr Nair or his secretary. The contact details are on page 1.

4. Do I have to take part?

No. It is up to you to decide whether or not to take part. If you do agree, you will be asked to sign a consent form. You are free to change your mind and withdraw the consent at any time and without giving a reason. A decision not to take part or to withdraw at any time, will not affect your treatment or care.

5. What will taking part in the study involve?

If you agree to participate in this trial, you will first be assessed by one of the study doctors to check that you meet the entry requirements for the study. This will include a review of your medical history and a clinical examination of your arm and its level of tightness.

If you do meet the entry requirements, your participation in the study will last for:

- **32 weeks <u>in total</u>**
- You will only need to do study activities for **10 weeks** (**<u>active weeks</u>** of the study)

Treatments:

- Everyone in the study will continue to receive usual care.
- In addition, if you are in groups 1 or 2, you (or your carer, if appropriate) will need to apply the stimulation for 1 hour every day to the back of your upper arm for 6 weeks.
- You should continue to take your medications.
- You should not get involved in any other drug studies on spasticity.

You will have several measurements done to assess the therapy. These are called '*Therapy Outcome Measures'*, which will be done before, during and after treatments. The measures are to assess how your arm tightness affects you. They will assess how much your ability to use your arm changes over time with the different treatments.

One measure will be done by you once per day during 'active weeks' – it is a simple self-assessment of how your arm tightness feels. You will receive training to do this. You will receive prompts to remind you when to do them.

While in the study, you will be asked to record if:

- You have any new or worsening health issues.

- You have had any problems relating to any arm therapy that you receive.

You will be given a standardised '*Health Events*' log sheet to do this. You will be asked to return a completed '*Health Events*' sheet for each Visit. This will be reviewed by the study doctor, at each visit.

The other **therapy outcome measures** will be completed five times during study visits. These include:

- Assessment of your arm tightness. This will be done by a therapist
- Assessment of your arm muscle strength. This will be done by a therapist
- A functional test of how well and fast you can use your arm to do simple tasks. This will be done with guidance from a therapist.
- 3 different questionnaires completed by you with the assistance of a therapist.
    - 2 relate to how satisfied you are with your life in terms of how you feel and what you are able to do day to day.
    - 1 relates to the impact of muscle tightness on your arm for doing daily activities.

In addition, you will receive one of three types of treatment for 6 weeks. The treatment will be allocated independently at random.

- Group-1 will receive the SHAPES stimulation plus usual care,
- Group-2 will receive TENS stimulation plus usual care
- Group-3 will receive usual care without any stimulation.

Neither you nor the researcher will be able to choose the group that you will be allocated to. This is because research studies have to reduce the risk of any bias in results.

The equipment used for groups 1 and 2 will look the same and neither you nor the researcher will know which type of stimulation you will receive. Everyone in the study will have their arm function assessed by a therapist. You will be asked to complete some questionnaires about how your arm spasticity affects you.

You will be asked not to mention to the therapists assessing your arm whether you have been given a stimulator device or not. This is important because the research study has to minimise any risk of accidental bias of its results. If you were to accidently mention it, the therapist will note that you did. For future

visits, you would see a different therapist who did not know which treatment you were having.

There will be 1 telephone call (or video-call if you prefer) call (Visit 3) with a member of the study team to check how you are getting on during treatment.

After the six weeks of treatment, we will ask you to undergo follow-up assessments of your arm with a therapist at 6 weeks, 12 weeks and 24 weeks after you complete the treatments. Agreeing to participate will involve one hospital visit and five visits to a clinic in Sheffield

You will also be offered an optional interview about your experiences of the treatments with a study team researcher from Coventry University. It will be shortly after you finish the treatments. If you agree, it will be a telephone or video call to suit your preference.

SUMMARY OF STUDY ACTIVITIES:

Locations:

CRF: Clinical Research Facility, O Floor, Royal Hallamshire Hospital, Sheffield, S10 2JF

CC: Community Clinic, Sheffield.

TC: Home - contacted by telephone (or video) call to suit you

Visit	When?	Where?	What happens?	Who's involved?
1		CRF	• Discussion and Consenting • Suitability review for study entry • Training to do spasticity diary • Provision of paper or electronic diary & health events log sheets	You, your carer too if you wish, and the study doctor
	1 week before Visit 2	Home	• *Diary & health events reminders sent* • Do 7 days of spasticity diary	You, with help from your carer if needed
2	Week 2 (*after entering study*)	CC	• Attend a clinic in Sheffield. • Return spasticity diary • Therapy outcome measures done • *If in Group 1 or 2 - training to use stimulator*	You and a research therapist and *clinical scientist*
	Weeks 2-8	Home	• Complete daily spasticity diary • Record any Health Events	Participants with carer if

			• Receive usual care • *If in Groups 1 or 2: use stimulator for 60minutes each day*	required
3	Weeks 3-4	TC	• Check on how you are managing. • Check no problems • Help provided if needed	You and clinical scientist
	1 week before Visit 4	Home	• *Diary & health events reminders sent* • Do 7 days of spasticity diary	You, with help from your carer if needed
4	Week 8	CC	• Attend a clinic in Sheffield. • Return spasticity diary • Therapy outcome measures done	You and Research therapist
Optional interview	Between Weeks 9 - 13	TC	Telephone/video interview • Discuss your opinions on arm therapies received • *If in Group 1 or 2;* opportunity to feedback on stimulation therapy and on how easy the device was to use	You and project team researchers from Coventry University
	1 week before Visit 5	Home	• *Diary & health events reminders sent* • Complete 7 days of spasticity diary	You, with help from your carer if needed
5	Week 14	CC	• Attend a clinic in Sheffield. • Return spasticity diary • Therapy outcome measures done	Research therapist
	1 week before Visit 6	Home	• *Diary & health events reminders sent* • Do 7 days of spasticity diary	You, with help from your carer if needed
6	Week 20	CC	• Attend a clinic in Sheffield. • Return spasticity diary • Therapy outcome measures done	You and research therapist
	1 week	Home	• *Diary & health events*	You, with

	before Visit 7		*reminders sent* • Do 7 days of spasticity diary	help from your carer if needed
7	Week 32	CC	• Attend a clinic in Sheffield. • Return spasticity diary • Therapy outcome measures done	You and research therapist
	Week 33	Home	Your active involvement in SHAPES study has ended. Thank you.	You and your carer
If you choose to be kept updated: • SHAPES study progress and results will be sent to you				Study team

Visit 1 (Week-1)

You will be asked to attend the Clinical Research Facility at the Royal Hallamshire Hospital, in Sheffield. You will be given an opportunity to discuss the study and any concerns you may have. You will be asked to sign two consent forms. One copy will be given to you to keep and your study doctor will keep the other.

After obtaining your consent, a doctor from the research team will do a clinical examination to see whether you meet all our entry criteria. This involves moving your arms and testing the strength of movements of your arm. You will be asked questions about the severity of your elbow spasticity.

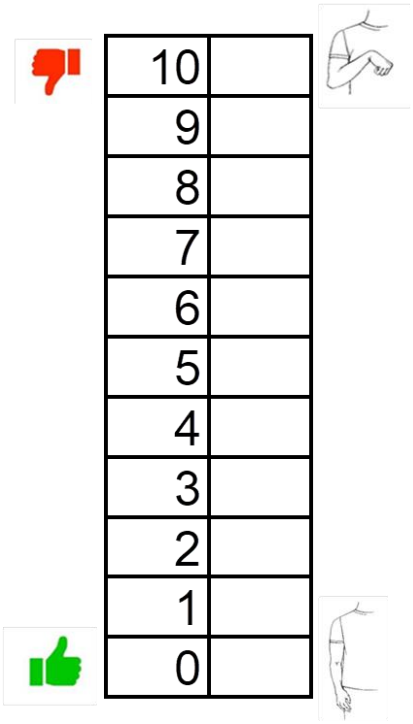
If you meet the entry requirements:

You will be trained to assess and record the severity of your elbow spasticity. You will be asked to consider how it felt during the previous 24 hours. You will assess the severity of your elbow spasticity using a scale ranging from 0 to 10 as shown. It is a scale to measure of the severity of 'spasticity' (muscle stiffness or tightness).

You will be asked to assess and record the number on a daily log sheet at a consistent time <u>every day</u>, ideally between 6pm and 9pm. Together, the completed daily log sheets will form a spasticity diary. The first spasticity diary will span the 7 days before you start receiving study treatments.

You will have to 'tick' the box next to the number which best reflects how your arm stiffness has felt over the previous 24 hours.

0 indicates none at all. The numbers on the scale indicate increasing levels up to 10 which is the most severe spasticity imaginable and will be shown as similar to the picture below.



Which box on the 0-10 scale above best shows the level of spasticity that you have had over the last 24 hours?

Zero (0) is good because it means that you have no spasticity in your elbow and can move it freely, whereas, ten (10) is bad because is it the worst elbow spasticity that you can imagine, where the elbow is very stiff and cannot be moved.

The log sheets forming the spasticity diary may be in paper form or on a smartphone that we will provide – whichever is your preferred option. If you choose the paper form, we will provide a folder of log sheets for you.

Your name will be randomly allocated to either: group-1, group-2 or group-3.

If you are in the hospital or rehabilitation centre, you will continue to stay there. Participation in this research will not affect your length of stay in hospital or rehabilitation centre. If you live at home or at a care home, you can go back to your place of residence.

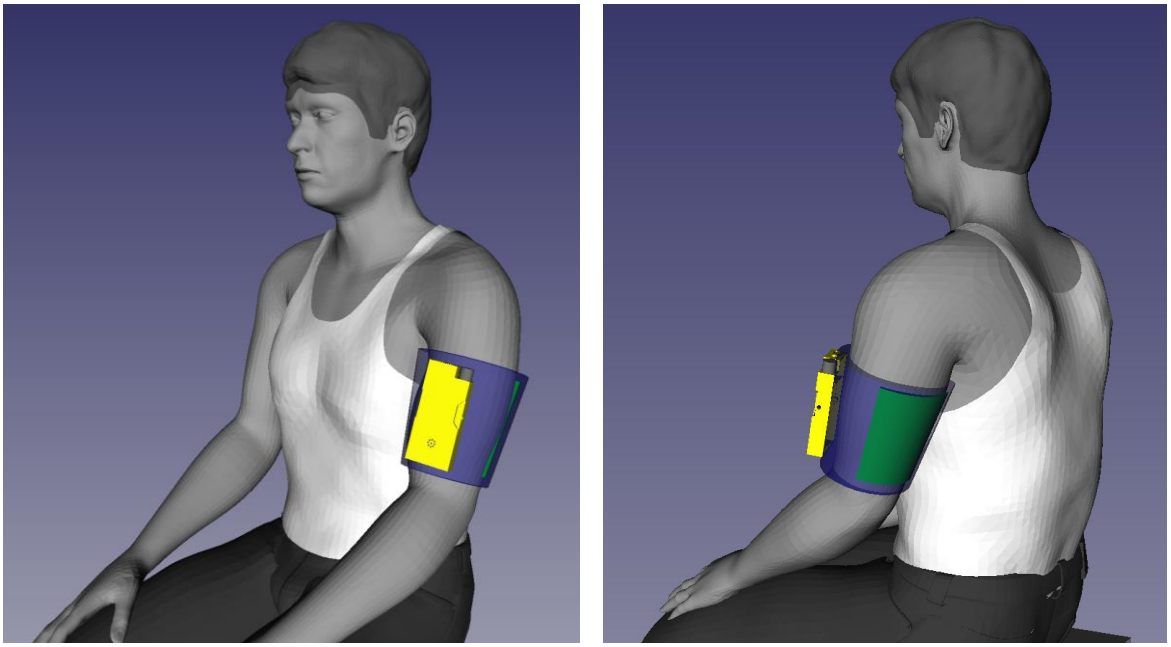
Visit 2 (Week-2)
You will need to come to a community clinic in Sheffield for a visit.

You will have been allocated randomly to either: group-1, group-2 or group-3. The length of the appointment will be appropriate to your group allocation.

If you are in Group-3 you will continue to receive your usual therapy.

For those in groups 1 and 2, you will receive one of the two types of stimulation therapy in addition to usual therapies. A clinical scientist will set up the stimulator device with you, making sure that you know how to use it by yourself, or with your own carer if appropriate.

The device is worn on the upper arm and is held in place with a comfortable stretchy sleeve. The sleeve helps the electrode pad stay in place on the arm so that the stimulation is delivered consistently and where it is intended. This is shown in Figures 1 and 2.



Figures 1 & 2: Pictures of the device setup showing the stimulator (in yellow), electrodes (in green) and arm sleeve (in blue)

The researcher will show you and help you to place the square of electrodes on to the back of your upper arm and put on the arm sleeve. They will carefully set the stimulation at a level that is personalised for you. The stimulation should cause a tingling sensation that you can feel, but not any muscle twitching or movement of the arm. This part can take a few minutes. After the researcher has set-up the stimulator for you the device will

automatically start at the same level of stimulation each time you use it. You will be able to adjust this level for comfort if necessary.

Once set-up, you will receive either SHAPES or TENS stimulation over your upper arm for 15 minutes to check that you are comfortable and know what to expect. These two types of stimulation will stimulate the nerves using gentle electric pulses. The pulses cause a tingling sensation. Some people may find these sensations slightly unpleasant but if necessary the researcher will adjust the level of stimulation to make it more comfortable for you. You may develop temporary redness or discolouration of the skin under the sleeve. This should settle down on its own. The researcher will look for any side effects after the stimulation. You or your carer will then be trained to use the device, including placing it on your arm.

You or your carer will have to apply the stimulation for 1 hour every day to the back of your upper arm for the next 6 weeks.

For all groups, you or your carer will record the severity of elbow spasticity in a diary at a consistent time every day, ideally between 6pm and 9pm. You will also be given pack of 'Health Events' sheets (one per visit) to record any health issues that you may have during the study. Everyone will have their therapy outcome measures assessed.

Visit 3 (Week-3-4)
After approximately 2 weeks, a researcher will contact you to see how you are getting on. They will check that you are recording the spasticity diary and managing with any equipment that you have been provided. A visit will be offered if additional help is required. They will also check whether you have experienced any issues with your therapy.

Visit 4 (Week-8)
You will need to come to a community clinic in Sheffield for a visit.

- You should bring back any study equipment that you have been given.
- Before attending, you will be reminded not to mention to the research therapist whether or not you had used a stimulator device.
- You will also be reminded to think about any health issues you may have had. These should be recorded on the '*Health Events*' log sheet and brought with you.

- If you chose to record the spasticity diary on paper log sheets you will need to bring the folder of completed sheets with you.

The research therapist will again do the series of 'Therapy Outcome Measures' with you. This will include assessing the stiffness of the muscles in your arm. You will also be asked to return your '*spasticity diary*' and '*Health Events*' log sheet. You will be asked whether you had any health issues following your treatment. If you did, these will be reviewed by a study doctor.

A study researcher (not the therapist) will collect the study equipment from you. We will use the data recorded in the device about its usage and function. You will be given new forms to record your spasticity or issued a smartphone and App to record it if that is your preference.

Between visits 4 and 5, you will be offered an interview about your experience of the arm therapies. This will be optional. If you agree to take part, you will be contacted by study researchers from Coventry University. The interview will be by telephone or video call to suit your preference.

You will also be asked if you agree to the optional interview being recorded. Whether it is recorded or not, and in what form is your choice. You can choose audio only, audio and video, video only or none as appropriate to the type of call.

If you choose to have a carer with you during the interview, your carer will also be asked if they agree to being recorded. Its purpose is to aid the researcher in taking accurate notes. Recordings will be deleted once the transcribed notes are completed.

The researchers will ask about your experience of the treatments that you have received. This will include your, (and, if appropriate your carer's) experiences of the stimulator if you used one.

For each of the 3 follow-up visits after the study treatments at:

- **Visit 5** (Week-14)
- **Visit 6** (Week-20)
- **Visit 7** (Week-32)

The following activities will be done:

- One week before each visit we will contact you by telephone to remind you to start recording your spasticity diary for the next 7 days. You will

also be reminded to think about any health issues you may have had. These should be recorded on the '*Health Events*' log sheet.
- Before attending, you will be reminded not to mention to the research therapist whether or not you had used a stimulator device.
- If you live at home or in a care home, you need to come to a community clinic in Sheffield. You can choose to have a carer with you if you wish.
- You will need to bring your completed '*spasticity diary'* and '*Health Events*' log sheet with you.
- The research therapist will again do the series of 'Therapy Outcome Measures' with you. This will include assessing the stiffness of the muscles in your arm. You will be asked whether you had any health issues following your treatment. If you have had any health issues, these will be reviewed by a study doctor.

Visit 7:
- If you had been loaned a Smartphone, you will be reminded to bring it with you for your visit. It will be collected from you.
- We will ask whether you wish to be kept informed of study progress. If you do, we will record your preferred means of receiving updates.

We will reimburse the travel expenses for you and your carer. We will reimburse the taxi fares or travel expenses at the rate of 40p per mile per journey.

6. What are the alternatives for diagnosis or treatment?

The SHAPES or TENS stimulation is in addition to your usual treatment. Current treatments of spasticity include mainly medications such as baclofen, tizanidine, gabapentin, dantrolene and diazepam, and botulinum toxin injections. During the study period we will not alter your on-going treatment (unless this is medically needed).

7. What are the side effects of any treatment received when taking part?

The sensory stimulation used with this study is not associated with any known side effects. We do not anticipate any permanent or serious adverse effects. Possible side effects include a feeling of tightness during the therapy, skin redness, discolouration, or irritation and rarely pain. These side effects are transient, lasting only for few minutes. However, as there is only limited experience with SHAPES, there might be unknown side effects.

8. What are the other possible disadvantages and risks of taking part?

This study requires 7 visits, which are otherwise not required.

- 1 hospital visit
- 5 Sheffield clinic visits
- 1 telephone or video-call

Plus:

One optional telephone/video interview

If you are in Group 1 or 2:

- You will need to apply the stimulation for one hour each day for 6 weeks.
- During the intervention, you may experience discomfort from the stimulation.

If you participate in the study, it may affect any private medical or life insurance that you may have. We encourage you to discuss this issue with your insurers before you agree to participate.

9. Harm to the unborn child

We do not know the effect of SHAPES on an unborn child. If you are pregnant you will not be invited to take part. . Women of child bearing potential who consent to participate will be tested for pregnancy. This will be done before entering into the trial.

10. What are the possible benefits of taking part?

You are not expected to gain any benefits from taking part in this research. The information we get might help improve the treatment of people with spasticity due to stroke. The treatment may result in a temporary reduction in the spasticity in your arm. We will follow-up at 6 weeks, 12 weeks and 24 weeks. This is to see if there might be reductions in your arm spasticity that continue after you finish the study.

11. What happens when the research study stops?

This intervention will not be available once the study is over. Your on-going treatment for spasticity will be continued.

12. What if there is a problem?

Complaints

If you have a concern about any aspect of this study, you should ask to speak with Dr S. Nair immediately who will do his best to answer your questions. If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details of your options for making a complaint can be obtained from the website of Sheffield Teaching Hospitals NHS Foundation Trust:

- https://www.sth.nhs.uk/patients/patient-experience/feedback/how-to-make-a-complaint/
- If you would prefer to speak with someone outside of the study team or its department you can contact the Patient Advice and Liaison Service on:
  - Telephone: 0114 271 2400 or
  - Email sth.pals@nhs.net

You can also contact Kirsten Major, Chief Executive of Sheffield Teaching Hospitals NHS Foundation Trust at:

- 8, Beechill Road, Sheffield, S10 2JF or
- Telephone: 0114 2712358

Harm

In the event that something does go wrong and you are harmed during the research study there are no special compensation arrangements. The NHS Trust which employs the study doctors and other researchers working under his or her supervision provide insurance cover against claims for negligence (including injury sustained by not following the protocol).
If you sustain an injury due to the negligence of the study doctor or someone working under his/her supervision, procedures are in place to enable you to make a claim for your injury.

If you are harmed and this is due to someone's negligence then you may have grounds for a legal action for compensation against Sheffield Teaching Hospitals NHS Foundation Trust but you may have to pay your legal costs. The normal National Health Service complaints mechanisms will still be available to you.

You have the right to withdraw from the study at any time you wish. This will not affect your on-going treatment in any way.
Should you have any complaints regarding this study, please contact your study doctor.

Loss or damage to the study equipment

We ask that you be as careful as possible with any study equipment that you will be loaned. We appreciate that accidents can happen. We wish to reassure you that you will not be held liable for any loss or damage to devices loaned to you.

13. How will we use information about you?

We will need to use information from you, from your medical records and from your GP for this research project.

This information will include your Name, Date of Birth, NHS number, contact details, and necessary medical information to ensure your safety and eligibility to participate. People will use this information to do the research or to check your records to make sure that the research is being done properly.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

14. What will happen to the results of the research study?

What are your choices about how your information is used?

- You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.
- If you choose to stop taking part in the study, we would like to continue collecting information about your health from [central NHS records / your hospital / your GP]. If you do not want this to happen, tell us and we will stop.
- We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

With your permission, your research doctor will contact your GP to inform him or her that you are participating in this research study.

15. Will my taking part in the study be kept confidential?

All the information about your participation in this study will be kept confidential. Your personal information collected during the study will be kept for 12 months following completion of the study. The information collected will not identify you by name. If the results of the study are published your identity will remain confidential.

Once you consent to be recruited into the study and have been screened as eligible to take part, you will be allocated a unique code number. All study data will reference the code number and not your personal identifiable data. Therefore, your personal information will be anonymised. Only where people within the study team really need to know will we let them have your name or contact details.

Anonymised data collected from you during the study will be electronically stored on secure NHS computer systems. It will be kept for a period of fifteen (15) years and then destroyed. The computer systems will be managed by Sheffield Teaching Hospitals NHS Foundation Trust. Any paper-based data will be stored securely at the Royal Hallamshire Hospital, Glossop Road, Sheffield, S10 2JF. You have rights under the UK General Data Protection Regulation (UK GDPR), as tailored by the Data Protection Act 2018. These are:

- To control the use of your medical information
- To be able to request access to all information processed about you
- To have any wrong data about you corrected.

16. Where can you find out more about how your information is used?

You can do this through your study doctors or through the Sponsor's Data Protection Officer.

Data Protection Officer:

Sheffield Teaching Hospitals NHS Foundation Trust
2 Claremont Place
Sheffield
S10 2TB
Telephone: 0114 226 5153
Email: sth.infogov@nhs.net

For more information about how we will use and protect your data, please see:

- https://www.sth.nhs.uk/about-us/general-data-protection-regulations

The information collected will be available to the Study Sponsor. This is Sheffield Teaching Hospitals NHS Foundation Trust. Its 'Clinical Research and Innovation Office' will use it for audit and monitoring purposes. Anonymised data relating to study device safety could be requested by UK regulators. This could include the Medicines and Healthcare Products Regulatory Agency.

17. What if relevant new information becomes available?

Sometimes new information becomes available about the treatment that is being studied during the course of a research project. If this happens, one of the research doctors involved in this study will tell you about it and discuss whether you want to continue in the study.

If you decide not to carry on, your research doctor will make arrangements for your care to continue. If you decide to continue in the study you will be asked to sign an updated consent form. Equally, on receiving new information, your research doctor might consider it to be in your best interests to withdraw you from the study. They will explain the reasons and arrange for your care to continue. If the study is stopped for any other reason, you will be told why and your continuing care will be arranged.

18. What will happen if I don't want to carry on with the study?

You can withdraw from the study at any time. This will not affect your on-going treatment in any way. We will ask for your permission to keep in contact with you to assess your progress. We will analyse the information already collected.

19. Will my General Practitioner/Family doctor (GP) be informed?

Your own GP and other medical practitioners who are involved in the research and who may be treating you may be notified of your participation in the trial but only with your permission.

20. What will happen to the results of the research study?

We intend to publish the study results in medical and scientific journals and to present them in various meetings. You will not be identified in any report, publication, or presentation without your consent. Short direct quotations may

be used in publications but would not be attributed to an individual or be identifiable. We will also inform you about the results of the trial as and when they are available.

21. Who is organising and has reviewed the study?

This study has been reviewed by an independent Research Ethics Committee (REF: 22/LO/0203), who protect your safety, rights, wellbeing and dignity. Sheffield Teaching Hospitals NHS Foundation Trust has overall responsibility for the study. It is funded by the National Institute for Health Research (Ref: NIHR 201642).