SEvERe-PTS: Structured Exercise vs Endovascular Reconstruction in Post Thrombotic Syndrome. (pilot study)

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Invitation and brief summary

We would like to invite you to take part in our research study. It is designed to look at the role of exercise in treating post thrombotic syndrome, which is a long-term condition that can occur after a clot in the leg (DVT). If you are interested in taking part, please read the following information carefully before deciding. One of the research team will explain this to you and answer any questions you may have.

What's involved?

Currently, treatment for Post Thrombotic Syndrome (PTS) involves a surgical procedure with a wire and balloon to open the vein and if required use a metallic mesh tube called a stent to hold it open. We want to see if doing an exercise programme is as effective as having surgery.

Why am I being asked to take part?

You have been asked to participate in this study because you have Post Thrombotic Syndrome, which is the condition that is being studied.

What would taking part involve?

We are asking patients who would normally have a stent procedure and a group of healthy volunteers to complete a series of exercise tests. We will be assigning 18 patients to do an exercise programme, 18 patients to have their stent procedure as planned and 18 healthy volunteers will also be tested.

You will be asked to attend for two exercise testing visits twelve weeks apart. You will have a follow up appointment six-months after the second set of exercise tests. This is a total of three study visits.

Cardiopulmonary Exercise Test (CPET) on a stationary bicycle – This will test your maximum ability to exercise on a stationary bicycle. We will use a specialised mask to measure your breathing. We will also monitor your heart rate and blood pressure.

Specialised walking tests – We will see how far you can walk in six minutes. We will also ask you to walk on a treadmill at a steady speed that will get steeper every two minutes. The speed of the treadmill will then increase once every two minutes up to a maximum of 3 miles per hour (fast walking speed).

Calf muscle strength and function – We will test the maximum strength of your calf muscle using a specialised machine, this measures how forcefully you can contract your calf muscles. We will test how well the calf muscles pump blood back out of the legs by asking you to lie down and then do some tiptoe manoeuvres. You will have a stretch device attached to your calf and an infra-red sensor that will tell us how well the calf empties.

General and specific measurements – We will measure your height and weight and use these to calculate your BMI. We will specifically measure your calf circumference and the range of movement at your ankle joint.

Ultrasound tests – Before and after you do the walking test, we will scan the veins in your legs and groin to measure how wide they are and how fast the blood is flowing through them.

For the exercise tests that have been described, we will monitor the blood and oxygen in your calf muscle using a sensor. The testing will take between 3-4 hours in total to complete. There will be opportunities to take breaks throughout the day and you can request this at any time. Please bring comfortable exercise clothing that allows access to your calves and appropriate footwear (such as trainers, plimsoles or running shoes).

If you are happy to return on a second occasion at least five days later, we will repeat the CPET test described above on a treadmill instead of a bicycle. This is entirely optional and will be offered to you if it is convenient for you to attend. This is an optional fourth study visit

Patients will be split into two groups. This will be assigned by the research team. You will know exactly which group you are in.

Group 1 (18 patients): Will do an exercise programme. This is designed to get people moving and strengthen the muscles in the leg. It can be done at home, in the gym or outside and is guided by an app that can be downloaded onto a phone. The exercise programme will last a total of 12-weeks and consist of 5 days of activity. Each session will last 30 minutes. Each week, the exercises will consist of cardiovascular activity for three sessions and strength and flexibility for two sessions. There will be video, audio, and written instructions available in the app for each exercise. The exercises can also be accessed via a website or if needed can be printed out. We will be providing a FitBit that will help track heart rate and daily step count. After the exercise program is complete, participants will be invited back to repeat the exercise tests and questionnaires. After the second set of exercise tests are complete, group 1 patients will be able to go on and have their surgical procedure as planned. Group 1 patients will be contacted by the research team on a fortnightly basis. We will ask you how many steps you are managing to do and if there are any problems. If you are experiencing problems with the exercise, we will adjust this for you and review it on a weekly basis.

Group 2 (18 patients) Will be given a FitBit to track their normal day to day activity and heart rate. They will have their stent procedure as planned. Once they have undergone their stenting procedure, they will be invited back to repeat the exercise tests and questionnaires. They will have their normal follow up visits as usual.

We aim to co-ordinate study activities with follow up visits wherever possible to minimise travel. There is more information about using the FitBit devices at the end of this document, please read this carefully.

The requirements to take part

- Have post thrombotic syndrome due to DVT or other cause that has been present for 12 months or longer and be suitable for a stent under usual conditions.
- Be aged 18 or older
- Be willing to take part in the study and commit to the study requirements

We cannot accept patients who:

- Are younger than 18
- Have had a DVT or Pulmonary embolism (blood clot in the lung) in the last 12 months
- Have significant disease of the Heart, Lungs, Kidneys, or Liver
- Have Muscular disease or Neurological disease
- Have active cancer
- Are not expected to live more than 2 years
- Are pregnant or planning to get pregnant within the study period
- Who have another (medical) reason to not take part in exercise
- Have any condition that affects the ability to understand this information and give consent to take part
- Be taking part in another clinical trial or study at the same time as this one

We will write to your General Practitioner (GP) with your permission to let them know you are involved in a clinical trial and provide them with contact details if there are any issues relating to the study.

Please be reassured that taking part in the study will not affect your treatment. You will have all your imaging and radiology tests as normal (standard of care). If you are in group 1 and on the waiting list for a surgical procedure, you will still have that as planned. We aim to be able to complete all of the study activities well before your surgery date. If, for whatever reason, your surgery is moved forward and this is within the study period, we will simply withdraw you from the study. Patients in group 2 will have their exercise tests arranged so that they co-ordinate with their surgery date. You will need to return the Fitbit to us either at the end of the study or at the point you are withdrawn.

For Group 1 there will be the option to continue using the physiotherapy platform at the end of the study period. The research team will liaise with the Vascular Physiotherapists who will assess the ongoing physiotherapy needs.

What are the possible benefits of taking part?

The benefits of taking part in the project is that you will have closer contact and supervision from the clinical team as they are overseeing the research project. All participants will find out about their

current exercise ability and this information may be useful to you. All participants will be provided with a fitness activity tracker (Fitbit) for the duration of the study and this may be beneficial to you in tracking your own activity levels. Those participants that are allocated to do the supervised exercise programme may experience some of the benefits generally associated with being more active. This can include improvements in mood, sleep, energy levels as well as reducing stress and risk of other diseases. These are all general benefits of starting exercise and not specific to our study only.

The main benefit of taking part in this study is that you will be furthering the understanding of Post Thrombotic Syndrome and how it affects the day to day lives of people with this condition. This understanding may have an impact on the treatments that are developed and could eventually be used to treat all patients with PTS in the future.

What are the possible disadvantages and risks of taking part?

The main disadvantages of taking part in this project is that you will need to attend for additional exercise testing. Wherever possible we will try and co-ordinate this with any existing vascular appointments you have for follow up or scans, however this may not always be possible. If this is the case, we will re-imburse reasonable travel costs for additional visits to the hospital sites. The exercise testing can be strenuous, you may become tired during the exercise activities. You may experience tiredness or soreness on the following day or for a few days after. If you are assigned to the remotely supervised exercise programme, you may experience some of the downsides of starting a new exercise programme such as muscle soreness, feeling tired or having increased appetite.

Another potential downside is that we are asking participants to not plan to get pregnant during the study period. This may mean delaying any plans around pregnancy until after it has concluded or withdrawing from the programme.

Will I get paid to take part?

We will re-imburse any reasonable travel expenses for additional visits to carry out the testing. Please keep receipts for your travel.

How long do I have to decide?

We would strongly encourage you to take as much time as you can to read this information sheet and ensure you understand the contents. If you wish to take part, you will need to let us know within two weeks. You may change your mind at any time.

What will happen if I don't want to take part or carry on with the study?

You do not have to take part in this study and can withdraw at any point. If you do not want to take part, you will simply receive your treatment as planned. This will not affect your treatment in any way.

If you agree but later change your mind, you can withdraw at any point without giving a reason. We would be grateful if you are able to tell us why, but you do not have to do so. We will ask for you to

return the fitness tracker you were provided. You will continue with your treatment as normal and it will not affect your treatment. The research team will not collect any new data from you but will use the data that has already been collected.

What will happen to the results of the study?

We will publish the results in scientific journals and present them at conferences nationally and internationally. All of the patient data will be anonymous, and you will not be identified.

We will inform participants about the results by email.

The results will also form part of an educational degree and be included with a PhD thesis. There will be no identifiable information in any of the PhD documents such as the thesis, presentations or reports.

How will we use information about you?

We will need to use information from your electronic patient record (medical records) for this research project. This information will include your:

- Name
- Hospital Number and NHS number
- Date of Birth
- Contact details

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 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. Your study data will be part of your NHS record.

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 your electronic patient record. 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

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

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- our leaflet available from: www.guysandstthomas.nhs.uk/research/patients/use-of-data.aspx and www.kcl.ac.uk/research/support/research-ethics/kings-college-london-statement-on-use-of-personal-data-in-research (for KCL)
- by asking one of the research team (contact details included below)
- by contacting the Data Protection Officer: For GSTT: Nick Murphy-O'Kane DPO@gstt.nhs.uk, For KCL: Olenka Cogias info-compliance@kcl.ac.uk

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. Details are listed at the end of this form.

If you remain unhappy and wish to complain formally, you can do this through the Guy's and St Thomas' Patients Advice and Liaison Service (PALS) on 020 7188 8801, pals@gstt.nhs.uk. The PALS team are based in the main entrance on the ground floor at St Thomas' Hospital and on the ground floor at Guy's Hospital in the Tower Wing.

In the event that something does go wrong, and you are harmed during the research you may have grounds for legal action for compensation against Guy's and St Thomas' NHS Foundation Trust and/or King's College London but you may have to pay your legal costs. The normal National Health Service complaints mechanisms will still be available to you (if appropriate).

Who is organising and funding this study?

This study is being Sponsored by Guy's and St. Thomas' NHS Foundation Trust and co-sponsored by King's College London. The study is being funded internally by the Vascular Surgery Department.

How have patients and the public been involved in this study?

We have conducted patient and public involvement (PPI) work in the development of this study and have used the feedback and suggestions given to improve our study design.

Who has reviewed this study?

This study has been reviewed and approved by the London Bridge Research Ethics Committee. [awaiting submission to REC, delete once approved]

Further information and contact details

For further information about this study, please contact ehsanul.choudhury@gstt.nhs.uk or diana.roque@gstt.nhs.uk via email or call 020 7188 7188 ext 53821.

Fitbit terms and conditions

The Fitbit Inspire 2 fitness tracker will be loaned to you for use during the study. This will allow us to collect your step count and heart rate data. The device has several additional features that is not part of the study protocol. One such feature is the ability to detect an abnormal heart rhythm. If this occurs, please seek immediate medical attention from your GP, by calling 111 or attending the emergency department.

By taking part in the study and using the Fitbit, you are agreeing to the **Terms of Service** and **Privacy Policy** set out by Fitbit International Limited. Please take the time to read the terms and conditions carefully and let the research team know if you are not happy to accept these.

These can be accessed here:

- Terms of Service: https://www.fitbit.com/global/ie/legal/terms-of-service
- Privacy Policy: https://www.fitbit.com/global/ie/legal/privacy-policy

Fitbit is a subsidiary of Google LLC in California, USA. Fitbit and Google have the right to change the Terms of Service or Privacy Policy at any point. They will notify you of any change. King's College London and Guy's and St. Thomas' NHS Foundation Trust do not have any influence on this process.

Fitbit provides additional features that are not part of the study. These should not be used during the study period. They include:

- Fitbit Pay
- Fitbit Live Coaching
- Fitbit Paid services (including third party paid services)

Guy's & St. Thomas' NHS Foundation Trust and King's College London take no responsibility for the use of these additional features, participants do so at their own risk. Please refer to the **Terms of Service** and **Privacy Policy** linked above.

Please Note: Use of Fitbit Live Coaching will invalidate your participation and you will be withdrawn from the study.