

# Evaluating the role of graduated compression stockings in the prevention of blood clots in patients who undergo short-stay surgery and who are assessed as being low-risk of developing blood clots

<b>Submission date</b> 25/03/2022	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 29/03/2022	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 23/09/2025	<b>Condition category</b> Circulatory System	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Hospital acquired thrombosis is a term used to describe blood clots that may form in the legs and lungs after someone is treated in hospital. A clot in the leg can cause swelling, pain and other long-term problems, such as a leg wound (ulcer). If a clot in the leg breaks off and travels to the lungs, it can cause problems with the lungs' ability to transfer oxygen from the air into the blood and may be life threatening. Having surgery increases a person's risk of developing blood clots. There are a number of reasons for this including being unwell, being unable to move during surgery, and moving around less after surgery. To reduce the chance of a blood clot developing, doctors can give blood-thinning medications and elastic stockings that squeeze the leg muscles.

People having short stay surgery are those who are able to go home the same day or those who stay overnight but go home shortly afterwards. These people are at much lower risk of developing a blood clot than those who stay in hospital for longer. These low-risk people are often given elastic stockings to reduce the chance of developing a blood clot. The risks of wearing the stockings are very low but wearing stockings can be uncomfortable. Occasionally some people with poor blood supply to their feet, can develop wounds on one or both of their feet after wearing elastic stockings, but this is rare.

In the UK, there are over a million short stay surgeries performed each year and most of these people are given elastic stockings to wear. Collectively, these elastic stockings cost the NHS a lot of money and it remains unknown if they benefit these people.

A recent study in a different group of people, who are at higher risk of developing a blood clot and are usually given blood-thinning medications, showed that elastic stockings offered no additional benefit compared to just having blood-thinning medications alone. There are

currently no up to date studies specifically in this group of people that look at whether these elastic stockings reduce the chance of developing a blood clot.

The purpose of this study is to investigate if it is worthwhile to continue using elastic stockings in people having surgery where the risk of developing blood clots is low.

Who can participate?

People enrolled in the study will be over the age of 18 and scheduled to undergo a surgical procedure with a hospital stay less than 48 hours. All participants will be checked for their risk of blood clots when they arrive in hospital for surgery. This study will only include people where the check shows a low risk of developing blood clots, which will be assessed using a nationally recognised tool.

What does the study involve?

At random, participants will be given elastic stockings to wear during their time in hospital or not given elastic stockings at all. The surgery itself and all other processes will continue as normal.

Participants will be contacted (by telephone, email or SMS) at 7 days and 90 days after their surgery to see how they are getting on and to see if they developed a blood clot. Participants will be provided with information on the signs and symptoms of blood clots, such as a swollen painful leg. They will be advised to attend the emergency department if they develop any of the signs and symptoms, and not wait for the follow-up to avoid delay. If the doctors and nurses suspect a participant has developed a blood clot, they will come to hospital for extra tests and treatment which is best practice if a blood clot is suspected.

What are the possible benefits and risks of participating?

Possible benefits: Participants will receive increased education around VTE prevention (i.e. via the 'Signs and Symptoms of a blood clot' leaflet). Both patients and the health service stand to benefit from evidence to support the safe rationalisation of the use of GCS as a health technology.

Possible risks: The risks associated with graduated compression (GCS) use are low, particularly in this patient cohort where the expectation is to wear the stockings for a short period of time (i.e. from the time of surgery until ambulant [which may be as short as a few hours and no longer than 48-hours]). GCS may cause skin irritation and itching. Patients will be advised to speak to their healthcare professional at any point prior to (and indeed after) discharge should they have any concerns. Individuals with a contraindication to wearing GCS will not be included. The relevant participants will also be followed up at 7-days post procedure and information about any adverse events associated with GCS will be captured. We do not expect participation to result in any additional burden on the participant. Participants will be followed-up remotely at 7 and 90-days post-surgical procedure. Data can be provided via online survey, SMS or telephone depending on patient preference. Minimal data collection will occur at these follow-ups (i.e. only self-reported VTE outcome data, the short 5-item EQ-5D questionnaire and information on adverse events associated with GCS [if applicable] is collected at 7-days. At 90-days, only self-reported VTE outcome, the EQ-5D and the resource use questionnaire data is collected).

Where is the study run from?

Imperial College London (UK)

When is the study starting and how long is it expected to run for?

March 2022 to June 2026

Who is funding the study?  
National Institute for Health Research (NIHR) (UK).

Who is the main contact?  
1. Sarrah Peerbux (public contact), s.peerbux@imperial.ac.uk  
2. Prof. Alun Davies (scientific contact), a.h.davies@imperial.ac.uk

## Contact information

### Type(s)

Principal investigator

### Contact name

Prof Alun Davies

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### Type(s)

Public

### Contact name

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### ORCID ID

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## Additional identifiers

### Integrated Research Application System (IRAS)

312752

National Institute for Health and Care Research (NIHR)

## Study information

### Scientific Title

Examining the benefit of graduated compression stockings in the Prevention of venous Thromboembolism in low-risk Surgical patients: a multicentre cluster randomised controlled trial (PETS Trial)

### Acronym

PETS

### Study objectives

The principal objective of this study is to evaluate the potential benefit of GCS in the prevention of VTE in patients undergoing short-stay surgical procedures, assessed as being at low-risk for VTE.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved 31/05/2022, London - Camden and King's Cross REC (Level 3, Block B, Whitefriars, Lewins Mead, Bristol, BS1 2NT, UK; +44 207 1048089; camdenandkingscross.rec@hra.nhs.uk), ref: 22/LO/0390

### Study design

Multicentre cluster randomized controlled trial

### Primary study design

Interventional

### Study type(s)

Prevention

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

Prevention of venous thromboembolism (VTE) in patients who are deemed to be at low-risk of developing VTE and who undergo day-case/short-stay surgical procedures.

### Interventions

This is a cluster-designed RCT in which study centres will either be randomised to intervention or control.

Centres randomised to the intervention arm, which is the current standard of care, will consist of participants receiving graduated compression stockings (GCS). Clinical staff (e.g. preassessment or theatre support workers) will issue stockings to all patients who are scheduled to undergo short-stay surgery. Participants will be instructed to wear their stockings just before undergoing the surgical procedure and to remove the stockings as soon as they are ambulant (i.e. after the procedure).

In those centres randomised to the control arm, participants will not receive graduated compression stockings.

### **Intervention Type**

Behavioural

### **Primary outcome(s)**

Self-reported VTE within 90-days of short-stay surgical procedure.

### **Key secondary outcome(s)**

1. Mortality measured using patient notes and SAE log review at 7 and 90-days
2. Cost-Effectiveness Ratio measured using the Incremental Cost-Effectiveness Ratio (ICER) at 90 days
3. Generic Quality of life (as measured by the EQ-5D) at 7 and 90-days
4. Adverse events with GCS (at 7-days, for participants enrolled in the site randomised to the 'stockings' cluster only) measured using patient records

### **Completion date**

30/06/2026

## **Eligibility**

### **Key inclusion criteria**

1. Adults (18-59 years of age) scheduled to undergo a surgical procedure with a hospital stay <48 hours
2. Individuals assessed as being at low-risk of developing VTE as per the DHRA tool i.e. no assessed thrombosis risk factors / scoring 0

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

### **Upper age limit**

59 years

### **Sex**

All

### **Total final enrolment**

11321

## **Key exclusion criteria**

Current exclusion criteria as of 12/09/2024:

1. Individuals with a contraindication to GCS
  2. Individuals assessed as being at moderate or high risk of VTE as per the DHRA tool
  3. Individuals requiring therapeutic anticoagulation
  4. Individuals requiring pharmacological prophylaxis
  5. Individuals with thrombophilia/ thrombogenic disorder
  6. Individuals with a previous history of VTE
  7. Individuals requiring intermittent pneumatic compression therapy beyond theatre and recovery
  8. Female patients of childbearing age who have a positive pregnancy test
  9. Individuals with lower limb immobilisation
  10. Inability to provide informed consent
- 

Previous exclusion criteria as of 14/08/2023 to 12/09/2024:

1. Individuals with a contraindication to GCS
  2. Individuals assessed as being at moderate or high risk of VTE as per the DHRA tool
  3. Individuals requiring therapeutic anticoagulation
  4. Individuals with thrombophilia/ thrombogenic disorder
  5. Individuals with a previous history of VTE
  6. Individuals requiring intermittent pneumatic compression therapy beyond theatre and recovery
  7. Individuals requiring extended thromboprophylaxis beyond discharge
  8. Female patients of childbearing age who have a positive pregnancy test
  9. Individuals with lower limb immobilisation
  10. Inability to provide informed consent
  11. Individuals requiring pharmacological prophylaxis
- 

Previous exclusion criteria:

1. Individuals with a contraindication to GCS
2. Individuals assessed as being at moderate or high-risk of VTE as per the DHRA tool
3. Individuals requiring therapeutic anticoagulation
4. Individuals with thrombophilia/ thrombogenic disorder
5. Individuals with a previous history of VTE
6. Individuals requiring intermittent pneumatic compression therapy beyond theatre and recovery
7. Individuals requiring extended thromboprophylaxis beyond discharge
8. Female patients of childbearing age who have a positive pregnancy test
9. Individuals with lower limb immobilisation
10. Inability to provide informed consent.

**Date of first enrolment**

08/09/2022

**Date of final enrolment**

18/11/2024

## **Locations**

**Countries of recruitment**

United Kingdom

England

Scotland

Wales

**Study participating centre****North Bristol NHS Trust**

Southmead Hospital

Southmead Road

Westbury-on-trym

Bristol

United Kingdom

BS10 5NB

**Study participating centre****Epsom and St Helier University Hospitals NHS Trust**

St Helier Hospital

Wrythe Lane

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SM5 1AA

**Study participating centre****Hull University Teaching Hospitals NHS Trust**

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United Kingdom

HU3 2JZ

**Study participating centre****Nottingham University Hospitals NHS Trust - Queen's Medical Centre Campus**

Nottingham University Hospital

Derby Road

Nottingham

United Kingdom

NG7 2UH

**Study participating centre**  
**Guy's and St Thomas' Hospitals**  
Trust Offices  
Guy's Hospital  
Great Maze Pond  
London  
United Kingdom  
SE1 9RT

**Study participating centre**  
**University Hospitals of Leicester NHS Trust**  
Leicester Royal Infirmary  
Infirmary Square  
Leicester  
United Kingdom  
LE1 5WW

**Study participating centre**  
**Mid and South Essex NHS Foundation Trust**  
Prittlewell Chase  
Westcliff-on-sea  
United Kingdom  
SS0 0RY

**Study participating centre**  
**Cardiff & Vale University Health Board**  
United Kingdom  
CF14 4XW

**Study participating centre**  
**Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust**  
Doncaster Royal Infirmary  
Armthorpe Road  
Doncaster  
United Kingdom  
DN2 5LT

**Study participating centre**  
**Portsmouth Hospitals University NHS Trust**  
United Kingdom  
PO6 3LY

**Study participating centre**  
**Royal Free London NHS Foundation Trust**  
Royal Free Hospital  
Pond Street  
London  
United Kingdom  
NW3 2QG

**Study participating centre**  
**University College London Hospitals NHS Foundation Trust**  
250 Euston Road  
London  
United Kingdom  
NW1 2PG

**Study participating centre**  
**North West Anglia NHS Foundation Trust**  
Peterborough City Hospital  
Bretton Gate  
Bretton  
Peterborough  
United Kingdom  
PE3 9GZ

**Study participating centre**  
**Imperial College Healthcare NHS Trust**  
The Bays  
St Marys Hospital  
South Wharf Road  
London  
United Kingdom  
W2 1BL

**Study participating centre**  
**London North West University Hospitals**  
Watford Road  
Harrow  
United Kingdom  
HA1 3UJ

**Study participating centre**  
**Frimley Health NHS Foundation Trust**  
Portsmouth Road  
Frimley  
Camberley  
United Kingdom  
GU16 7UJ

**Study participating centre**  
**Leeds Teaching Hospitals NHS Trust**  
St. James's University Hospital  
Beckett Street  
Leeds  
United Kingdom  
LS9 7TF

**Study participating centre**  
**Sheffield Teaching Hospitals NHS Foundation Trust**  
Northern General Hospital  
Herries Road  
Sheffield  
United Kingdom  
S5 7AU

**Study participating centre**  
**Somerset NHS Foundation Trust**  
United Kingdom  
TA1 5DA

**Study participating centre**  
**University Hospitals Coventry and Warwickshire NHS Trust**  
Walsgrave General Hospital  
Clifford Bridge Road  
Coventry  
United Kingdom  
CV2 2DX

**Study participating centre**

**Hampshire Hospitals NHS Foundation Trust**  
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Aldermaston Road  
Basingstoke  
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RG24 9NA

**Study participating centre**  
**Hywel Dda Health Board**  
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Job's Well Road  
Carmarthen  
United Kingdom  
SA31 3BB

**Study participating centre**  
**York and Scarborough Teaching Hospitals NHS Foundation Trust**  
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York  
United Kingdom  
YO31 8HE

**Study participating centre**  
**North Tees and Hartlepool NHS Foundation Trust**  
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**University Hospital Southampton NHS Foundation Trust**  
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United Kingdom  
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**Study participating centre**

**St George's University Hospitals NHS Foundation Trust**  
United Kingdom  
SW17 0QT

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80 Newark Street  
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**Study participating centre**  
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**Chelsea and Westminster Hospital NHS Foundation Trust**  
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**Study participating centre**  
**North Cumbria Integrated Care NHS Foundation Trust**  
United Kingdom  
CA2 7HY

**Study participating centre**  
**The Hillingdon Hospitals NHS Foundation Trust**  
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Uxbridge  
United Kingdom  
UB8 3NN

**Study participating centre**

**University Hospitals Dorset NHS Foundation Trust**

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**Study participating centre**

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NE7 7DN

**Study participating centre**

**University Hospitals Birmingham NHS Foundation Trust**

Queen Elizabeth Hospital

Mindelsohn Way

Edgbaston

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United Kingdom

B15 2GW

**Study participating centre**

**Oxford University Hospitals NHS Foundation Trust**

John Radcliffe Hospital

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OX3 9DU

**Study participating centre**

**Swansea Bay University Local Health Board**

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Baglan

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**Study participating centre**

**NHS Greater Glasgow and Clyde**

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**Study participating centre**

**South Tees Hospitals NHS Foundation Trust**

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**Study participating centre**

**The Dudley Group NHS Foundation Trust**

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**Airedale NHS Foundation Trust**

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**Sherwood Forest Hospitals NHS Foundation Trust**  
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**Study participating centre**  
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**Blackpool Teaching Hospitals NHS Foundation Trust**  
Blackpool Victoria Hospital  
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FY3 8NR

**Study participating centre**  
**Royal Cornwall Hospitals NHS Trust**  
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**Study participating centre**  
**Homerton University Hospital**  
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London  
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E9 6SR

**Study participating centre**

**University Hospital of North Durham**

University Hospital of Durham

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DH1 5TW

**Study participating centre**

**County Durham and Darlington NHS Foundation Trust**

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DL3 6HX

**Study participating centre**

**Worcestershire Acute Hospitals NHS Trust**

Worcestershire Royal Hospital

Charles Hastings Way

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WR5 1DD

**Study participating centre**

**Northumbria Healthcare NHS Foundation Trust**

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NE29 8NH

**Study participating centre**

**University Hospitals Plymouth NHS Trust**

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**Study participating centre**

**Wye Valley NHS Trust**

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HR1 2ER

**Study participating centre**

**Northern Lincolnshire and Goole NHS Foundation Trust**

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**Study participating centre**

**South Warwickshire University NHS Foundation Trust**

Warwick Hospital  
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**Study participating centre**

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**Study participating centre**

**East Cheshire NHS Trust**

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**Study participating centre**

**Chesterfield Royal Hospital NHS Foundation Trust**  
Chesterfield Road  
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S44 5BL

**Study participating centre**

**Countess of Chester Hospital NHS Foundation Trust**  
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**Study participating centre**

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Rothwell Road  
Kettering  
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NN16 8UZ

**Study participating centre**

**Sandwell and West Birmingham Hospitals NHS Trust**  
City Hospital  
Dudley Road  
Birmingham  
United Kingdom  
B18 7QH

**Study participating centre**

**South Tyneside and Sunderland NHS Foundation Trust**  
Sunderland Royal Hospital  
Kayll Road  
Sunderland  
United Kingdom  
SR4 7TP

**Study participating centre**

**University Hospitals Bristol and Weston NHS Foundation Trust**

Trust Headquarters  
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United Kingdom  
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**Study participating centre**

**Wirral University Teaching Hospital NHS Foundation Trust**

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**Study participating centre**

**Milton Keynes University Hospital NHS Foundation Trust**

Standing Way  
Eaglestone  
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United Kingdom  
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**Study participating centre**

**Liverpool University Hospitals NHS Foundation Trust**

Royal Liverpool University Hospital  
Prescot Street  
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**Study participating centre**

**Cleveland Clinic London**

London  
United Kingdom  
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**Study participating centre**

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10 Arthur Street  
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**Study participating centre**

**James Paget University Hospitals NHS Foundation Trust**  
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United Kingdom  
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**Study participating centre**

**University Hospitals Sussex NHS Foundation Trust**  
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**Mersey and West Lancashire Teaching Hospitals NHS Trust**  
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Prescot  
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## **Sponsor information**

### **Organisation**

Imperial College London

## ROR

<https://ror.org/041kmwe10>

## Funder(s)

### Funder type

Government

### Funder Name

National Institute for Health Research

### Alternative Name(s)

National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

### Funding Body Type

Government organisation

### Funding Body Subtype

National government

### Location

United Kingdom

## Results and Publications

### Individual participant data (IPD) sharing plan

Data sharing statement to 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?
<a href="#">Protocol article</a>		17/01/2023	19/01/2023	Yes	No
<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Protocol file</a>	version 2.0	18/07/2022	13/10/2022	No	No
<a href="#">Protocol file</a>	version 3.0	29/11/2022	14/08/2023	No	No
<a href="#">Protocol file</a>	version 7.0	07/05/2024	12/09/2024	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes

