

# A controlled clinical trial investigating the clinical and cost-effectiveness of early Transjugular Intrahepatic Portosystemic Stent-Shunt (TIPSS) procedure to insert a stent (tube) in the liver to reduce pressure versus endoscopic plus drug therapy in patients with cirrhosis and acute variceal bleeding after initial control of bleeding by variceal band ligation (VBL)

<b>Submission date</b> 15/06/2023	<b>Recruitment status</b> Recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 30/06/2023	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 19/11/2025	<b>Condition category</b> Digestive 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

Cirrhosis (scarring of the liver) can lead to varices (abnormally enlarged veins) developing in the lower gullet (food pipe) or stomach causing the varices to bleed. Variceal bleeding is a serious complication of liver cirrhosis. The currently accepted treatment for patients who bleed from varices is known as the standard of care (SOC) and includes using an endoscope (a bendy tube incorporating light and a tiny video camera) to tie off an enlarged vein with a rubber ring (variceal banding) or injecting a drug, with a needle, directly into the swollen vein, causing the vein to clot and stop the bleeding. Patients may also be prescribed antibiotics and other drugs like beta-blockers to lower pressure in the enlarged veins to reduce the risk of further bleeding. For some patients, a device called a transjugular intrahepatic portosystemic stent-shunt (TIPSS) is used. The TIPSS procedure involves placing a special small metal tube, roughly 10mm in diameter, inside the liver using a wire passed through a vein in the neck and down through the liver. The procedure is done under sedation or general anaesthetic. TIPSS may be used to treat severe variceal bleeding in an emergency to stop bleeding where SOC has not worked or in patients that are at high risk of bleeding again after satisfactory stabilisation with SOC. This is called "early" TIPSS. The REACT-AVB trial will compare "early" TIPSS with SOC in severe variceal

bleeding patients to see if “early” TIPSS treatment is better than SOC in improving the survival of these patients. It will also compare cost-effectiveness and quality of life for the patients for both treatments. REACT-AVB will be recruiting patients from hospitals throughout the UK.

**Who can participate?**

Patients, aged 18 years and over who have liver cirrhosis and have been admitted to the hospital with variceal bleeding and have undergone an emergency endoscopy procedure for gastrointestinal bleeding

**What does the study involve?**

Once the patient has consented they will be randomly selected by a computer to one of the treatment arms. The treatment will continue for at least one year.

During the trial, patients will be seen at 3 separate time points, 6 weeks, 6 and 12 months (these normally coincide with their usual standard appointments) to assess their health. Patients will also be asked, by a research nurse to complete a health questionnaire form, (EQ5D-5L) on three separate occasions.

**What are the possible benefits and risks of participating?**

Whilst there is no guarantee that there will be any direct benefit to the patient, by taking part in the trial, they may feel empowered knowing that their contribution to the results of the trial should in the future, lead to the best treatment for variceal bleeding in patients with liver cirrhosis.

The TIPSS procedure has been in use for over 30 years and carries few complications. Variceal banding has been used for over 30 years and is generally considered very safe. For further details, please refer to the patient information sheet which can be accessed via the trial website <https://www.birmingham.ac.uk/react-avb>.

**Where is the study run from?**

University of Birmingham (UK)

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

December 2021 to November 2027

**Who is funding the study?**

National Institute for Health and Care Research (NIHR) (UK)

**Who is the main contact?**

Mrs Sukhi Sehmi (REACT-AVB Senior Trial Manager), [S.sehmi@bham.ac.uk](mailto:S.sehmi@bham.ac.uk) (UK)

## Contact information

**Type(s)**

Principal investigator

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**Type(s)**

Public

**Contact name**

Dr Study Team

**Contact details**

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**Type(s)**

Scientific

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**Additional identifiers****Integrated Research Application System (IRAS)**

314108

**Central Portfolio Management System (CPMS)**

54613

## Protocol serial number

/327501

# Study information

## Scientific Title

Randomised controlled trial of EARly transjugular intrahepatic portosystemic stent-shunt in Acute Variceal Bleeding (REACT-AVB)

## Acronym

REACT-AVB

## Study objectives

Current study objectives as of 19/11/2025:

Early transjugular intrahepatic portosystemic stent-shunt (TIPSS) within 5 days of acute variceal bleed results in improved transplant-free patient survival when compared with standard of care

Previous study objectives:

Early transjugular intrahepatic portosystemic stent-shunt (TIPSS) within 4 days of acute variceal bleed results in improved transplant-free patient survival when compared with standard of care

## Ethics approval required

Ethics approval required

## Ethics approval(s)

1. approved 29/09/2023, Scotland A Ethics Committee (NHS Lothian, Waverley Gate, 2-4 Waterloo Place, Edinburgh, EH1 3EG, United Kingdom; None available; Manx.Neill@nhslothian.scot.nhs.uk), ref: 23/SS/0050

2. approved 04/07/2023, West Midlands - Coventry & Warwickshire Research Ethics Committee (The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS, United Kingdom; +44 (0)207 104 8009; coventryandwarwick.rec@hra.nhs.uk), ref: 23/WM/0085

## Study design

Randomized interventional treatment device imaging study

## Primary study design

Interventional

## Study type(s)

Treatment

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

Complications of cirrhosis

## Interventions

Cirrhosis (scarring of the liver) can lead to varices (abnormally enlarged veins) developing in the lower gullet (food pipe) or stomach. Variceal bleeding is a serious complication of liver cirrhosis. Patients with variceal bleeding need treatment with one of the following:

- Medicines (beta-blockers which slow down the heart and lower pressure in the enlarged veins, this reduces the risk of further bleeding) and endoscopic treatment (using a bendy tube incorporating light and a tiny video camera to tie off varices with rubber bands or inject a drug) to stop the bleeding and prevent further bleeding. This is known as standard of care (SOC).
- For patients at high risk of bleeding again, an “early” Transjugular Intrahepatic Portosystemic Stent-Shunt (TIPSS) is offered to reduce the risk of further bleeding. The TIPSS procedure involves placing a special small metal tube, roughly 10mm in diameter (about the size of a grain of rice), inside the liver using a wire passed through a vein in the neck and down through the liver. The procedure is done under sedation (you will be sleepy) or general anaesthetic (you will be asleep). The procedure is done with X-ray imaging guidance. There have only been a few clinical trials comparing early TIPSS with SOC in a small number of patients. The results from these trials are not clear as to which patients benefit from early TIPSS and whether it works. Current guidelines recommend further research. Nobody so far has compared early TIPSS with SOC in a large clinical trial and obtained clear results. This trial is being conducted to find out if early TIPSS is better than SOC.

This trial will randomly assign (like flipping a coin) patients to either SOC or early TIPSS to avoid any bias and ensure patients in both treatment groups are well matched and similar. Once the treatment group (either SOC or early TIPSS) is assigned, the participant and research staff will know which treatment have been given. Potential participants with liver cirrhosis and admitted to the hospital with bleeding from varices will be invited to take part and given a patient information sheet to read. The decision to take part in the trial will be entirely voluntary. If a patient decides to participate, the research staff will ask the patient to read and sign the consent form. The signed consent form will stay on record in the participant's trial file and medical records and be available for review by the trial monitors. A copy will also be given to the participant and with their permission, a copy will also be sent to the REACT-AVB Trial Office at the University of Birmingham. During the trial, participants will be asked to confirm their willingness to continue in the trial. If they decide not to take part, their normal treatment will not be affected in any way and they will continue to be cared for by your normal care team who will ensure that they receive treatment for bleeding varices.

Where potential participants are critically ill and lack the capacity to consent for themselves because of sedation, infection and delirium, advice will be sought from a consultee (for sites in England, Wales and Northern Ireland) or consent will be sought from a legal representative (for sites in Scotland). When the participant regains capacity during the study, the site will need to confirm ongoing consent at the earliest opportunity. To protect the interest of patients, no trial procedure will take place until advice/consent has been sought.

During the trial, at 3 separate time points (baseline, 6 months, and 12 months), participants will be asked to complete a health questionnaire form, (EQ5D-5L). This may be carried out face-to-face with the research staff or remotely. With permission from the participant, a copy of the completed form will also be sent to the REACT-AVB Trial Office.

All patients who take part in the trial will be seen as usual clinical practice either in the clinic or over the telephone/video conference, every few months to assess well-being and to look for untoward effects. Patients in the early TIPSS group will have an ultrasound to check that the TIPSS is working well on 2-7 days. These patients do not require further endoscopies or beta-blockers. Patients in the SOC group will be prescribed regular beta-blockers and have endoscopies to treat the varices every few weeks to months depending on how well the varices respond to treatment.

The trial will seek to recruit just under 300 patients nationally over 4 years. It includes a 12-month pilot trial to address any problems early. The trial will also compare cost-effectiveness and quality of life for the patients for both treatments. If it is concluded that early TIPSS is more effective in terms of survival, cost, and quality of life than SOC, this could lead to a major change in clinical practice.

## Intervention Type

Other

### Primary outcome(s)

Transplant-free survival measured using the discharge and follow-up forms at one year (post-randomisation)

### Key secondary outcome(s)

Current secondary outcome measures as of 10/07/2023:

1. Transplant-free survival measured using the discharge and follow-up forms at 6 weeks (post-randomisation)
2. Rebleeding\* measured using the discharge and follow-up forms (post-randomisation):
  - 2.1. Early (less than or equal to 6 weeks)
  - 2.2. Late (greater than 6 weeks)
3. Serious adverse events (SAE) related to treatment measured using the SAE form (up to 12 months post-randomisation)
4. Other complications of cirrhosis measured using the discharge and follow-up forms (up to 12 months post-randomisation):
  - 4.1. New onset ascites
  - 4.2. New onset encephalopathy
  - 4.3. Spontaneous bacterial peritonitis
  - 4.4. Hepatocellular carcinoma
  - 4.4. Any renal dysfunction
5. Mortality prediction measured using Child-Pugh scoring at 6 and 12 months (post-randomisation)
6. Survival prediction measured using the Model for End-Stage Liver Disease (MELD) scoring at 6 and 12 months (post-randomisation)
7. Health-related quality of life measured using the EuroQol EQ-5D-5L at 6 and 12 months (post-randomisation)
8. Use of healthcare resources, costs and cost-effectiveness based on cost per Quality-Adjusted Life-Year (QALY) estimated measured using the EQ-5D-5L and cost per life year gained at one year, and modelled cost per QALY over a patient lifetime
9. Crossover therapies measured using the discharge and follow-up forms up to 12 months post-randomisation

\*Rebleeding is defined as hematemesis and/or melena with either:

1. Endoscopic evidence of variceal bleeding or stigmata of recent haemorrhage and at least a 2 g/L reduction in haemoglobin within 24 hours of admission
2. Massive upper gastrointestinal bleeding leading to death. The definition includes bleeding from banding ulceration.

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Previous secondary outcome measures:

1. Transplant-free survival measured using the discharge and follow-up forms at 6 weeks (post-randomisation)
2. Rebleeding\* measured using the discharge and follow-up forms (post-randomisation):
  - 2.1. Early (within 6 weeks)
  - 2.2. Late (6 weeks to 1 year)

3. Serious adverse events (SAE) related to treatment measured using the SAE form (up to 12 months post-randomisation)
4. Other complications of cirrhosis measured using the discharge and follow-up forms (up to 12 months post-randomisation):
  - 4.1. New onset ascites
  - 4.2. New onset encephalopathy
  - 4.3. Spontaneous bacterial peritonitis
  - 4.4. Hepatocellular carcinoma.
  - 4.4. Any renal dysfunction
5. Mortality prediction measured using Child-Pugh scoring at 6 and 12 months (post-randomisation)
6. Survival prediction measured using the Model for End-Stage Liver Disease (MELD) scoring at 6 and 12 months (post-randomisation)
7. Health-related quality of life measured using the EuroQol EQ-5D-5L at 6 and 12 months (post-randomisation)
8. Use of healthcare resources, costs and cost-effectiveness based on cost per Quality-Adjusted Life-Year (QALY) estimated measured using the EQ-5D-5L and cost per life year gained at one year, and modelled cost per QALY over a patient lifetime
9. Crossover therapies measured using the discharge and follow-up forms up to 12 months post-randomisation

\*Rebleeding is defined as hematemesis and/or melena with either:

1. Endoscopic evidence of variceal bleeding or stigmata of recent haemorrhage and at least a 2 g /L reduction in haemoglobin within 24 hours of admission
2. Massive upper gastrointestinal bleeding leading to death. The definition includes bleeding from banding ulceration.

### **Completion date**

30/11/2027

## **Eligibility**

### **Key inclusion criteria**

1. Liver cirrhosis as defined clinically, radiologically (ultrasound scan (USS) and/or transient elastography) or on histology
2. Acute variceal bleed (oesophageal or gastric) with haemostasis following initial endoscopic therapy
3. Child-Pugh score 7-13
4. Age > = 18 years

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

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Mixed

### **Lower age limit**

18 years

**Upper age limit**

100 years

**Sex**

All

**Total final enrolment**

0

**Key exclusion criteria**

1. Failure to control acute bleeding (as per Baveno 7 criteria) prior to randomisation.
2. Previous portosystemic shunt or TIPSS.
3. Known occlusive portal vein thrombosis precluding TIPSS.
4. Active cancer including hepatocellular carcinoma affecting 1-year survival.
5. Clinically significant encephalopathy causing recurrent hospital admissions.
6. Pregnant or lactating women.
7. Evidence of heart failure refractory to treatment.
8. Severe active septicaemia refractory to treatment.

**Date of first enrolment**

08/03/2024

**Date of final enrolment**

30/09/2027

**Locations****Countries of recruitment**

United Kingdom

England

Scotland

Wales

**Study participating centre**

**Queen Elizabeth Hospital**

Mindelsohn Way

Edgbaston

Birmingham

England

B15 2GW

**Study participating centre**

**Royal Free Hospital**

Pond Street  
London  
England  
NW3 2QG

**Study participating centre**

**Royal Infirmary of Edinburgh**

51 Little France Crescent  
Old Dalkeith Road  
Edinburgh  
Lothian  
Scotland  
EH16 4SA

**Study participating centre**

**Glasgow Royal Infirmary**

84 Castle Street  
Glasgow  
Scotland  
G4 0SF

**Study participating centre**

**John Radcliffe Hospital**

Headley Way  
Headington  
Oxford  
England  
OX3 9DU

**Study participating centre**

**Queens Medical Centre**

Derby Road  
Nottingham  
England  
NG7 2UH

**Study participating centre**

**The Whittington Hospital**

Highgate Hill  
London

England  
N19 5NF

**Study participating centre**

**Derriford Hospital**

Derriford Road  
Derriford  
Plymouth  
England  
PL6 8DH

**Study participating centre**

**Queen Elizabeth University Hospital**

1345 Govan Road  
Glasgow  
Scotland  
G51 4TF

**Study participating centre**

**Norfolk and Norwich University Hospital**

Colney Lane  
Colney  
Norwich  
England  
NR4 7UY

**Study participating centre**

**Good Hope Hospital**

Rectory Road  
Sutton Coldfield  
England  
B75 7RR

**Study participating centre**

**Northern General Hospital**

Northern General Hospital NHS Trust  
C Floor, Huntsman Building  
Herries Road  
Sheffield  
England  
S5 7AU

**Study participating centre**

**Heartlands Hospital**  
Bordesley Green East  
Bordesley Green  
Birmingham  
England  
B9 5ST

**Study participating centre**

**Southmead Hospital**  
Southmead Road  
Westbury-on-trym  
Bristol  
England  
BS10 5NB

**Study participating centre**

**Gloucestershire Hospitals NHS Foundation Trust**  
Cheltenham General Hospital  
Sandford Road  
Cheltenham  
England  
GL53 7AN

**Study participating centre**

**Queen Alexandra Hospital**  
Southwick Hill Road  
Cosham  
Portsmouth  
England  
PO6 3LY

**Study participating centre**

**New Cross Hospital**  
Wolverhampton Road  
Heath Town  
Wolverhampton  
England  
WV10 0QP

**Study participating centre**  
**Northwick Park Hospital**  
Watford Road  
Harrow  
England  
HA1 3UJ

**Study participating centre**  
**University Hospital Aintree**  
Fazakerley Hospital  
Lower Lane  
Liverpool  
England  
L9 7AL

**Study participating centre**  
**Manchester Royal Infirmary**  
Oxford Road  
Manchester  
England  
M13 9WL

**Study participating centre**  
**Royal Liverpool University Hospital**  
Prescot Street  
Liverpool  
England  
L7 8XP

## **Sponsor information**

**Organisation**  
University of Birmingham

**ROR**  
<https://ror.org/03angcq70>

## **Funder(s)**

## Funder type

Government

## Funder Name

National Institute for Health and Care 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

The datasets generated and/or analysed during the current study during this study will be included in the subsequent results publication. The trial data will be entered into a secure trial-specific database and data will not be publicly available prior to publication.

## IPD sharing plan summary

Published as a supplement to the results publication

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Protocol article</a>		22/03/2024	25/03/2024	Yes	No
<a href="#">Protocol file</a>	version 4.0	29/07/2025	19/11/2025	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes