

# BASIS Study - Comparing night-time versus full-time bracing in adolescent scoliosis (sideways curvature of the spine)

<b>Submission date</b> 14/04/2021	<b>Recruitment status</b> Recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 19/04/2021	<b>Overall study status</b> Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 12/02/2026	<b>Condition category</b> Musculoskeletal Diseases	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Scoliosis is a condition affecting children where the spine twists and curves to the side, often developing between the ages of 10 and 15. Doctors try to prevent the curve becoming too large, as this causes distress due to appearance, and problems into adulthood (back pain and problems with the heart/lungs). A brace may be worn in order to stop the curve worsening, but rarely improving it. The most common type of brace, "full-time brace", is recommended to be worn for at least 20 hours a day, and evidence suggests it can work. The alternative is a "night-time brace", which is only worn in bed at night, and aims to push the curve to make it straighter overnight, though the evidence for its benefit less clear. Night-time braces can interfere less with patients' usual activities. This study will compare night-time braces with the full-time brace and will find out patients' experiences of the two.

### Who can participate?

Children (10 - 15 years old) with scoliosis who have not previously received bracing.

### What does the study involve?

Participants will be randomly allocated to receive either a full-time brace, or a night-time only brace. Patients will be followed up with regular appointments and back x-rays, and will remain in brace until they have finished growing or need to have surgery. After bracing is stopped, patients will have further clinic visits at 1 and 2 years. Interviews will also take place with some participating families to understand their experiences of bracing.

Two patient groups and an online survey of Scoliosis Association UK (SAUK) members have reviewed the study and feel this is a relevant and important question. The groups have inputted into the design of the study, and we will continue to work closely with the group during the study.

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

Patients who do not take part in the trial would be treated using a full-time brace which can be uncomfortable to wear and cause skin irritation, especially in the first few months. This may also occur with the night-time brace used in this study, but this has no additional risks. Young people

who take part in this study, and their families, will be contributing to important research that will inform treatment choices for patients in the future. Young people who take part will also be under close follow-up, which is normal for those taking part in research. The night-time brace is currently only available through this study, but only to those allocated to this at the start.

Where is the study run from?  
University of Sheffield (UK)

When is the study starting and how long is it expected to run for?  
January 2021 to October 2032

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

Who is the main contact?  
Lizzie Swaby, e.a.swaby@sheffield.ac.uk

## Contact information

**Type(s)**  
Public

**Contact name**  
None Lizzie Swaby

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## Additional identifiers

**Integrated Research Application System (IRAS)**  
291133

**Central Portfolio Management System (CPMS)**  
48820

## Study information

### Scientific Title

Bracing Adolescent Idiopathic Scoliosis (BASIS) Study – night-time versus full-time bracing in adolescent idiopathic scoliosis

### Acronym

BASIS

### Study objectives

Night-time only bracing is non-inferior to full-time bracing in preventing curve progression to 50 degrees or more in children with Adolescent Idiopathic Scoliosis (AIS), before skeletal maturity

Added 14/05/2024:

BASIS 2 embedded study:

Aim: To determine if, amongst children at skeletal maturity who were successfully treated with a brace for AIS, 6 months of additional bracing significantly reduces curve progression and is acceptable to patients.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved 08/04/2021, North of Scotland Research Ethics Committee (Summerfield House, 2 Eday Road, Aberdeen, AB15 6RE, UK; +44 (0)1224558458; gram.nosres@nhs.net), ref: 21/NS/0038

### Study design

Interventional randomized controlled trial

### Primary study design

Interventional

### Study type(s)

Treatment

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

Sideways curvature of the spine (scoliosis)

## Interventions

Current intervention as of 30/05/2023:

The trial is being conducted in 22 large NHS trusts. Patients with AIS will be identified within the clinic setting - these will either be new patients or patients that are already seeking treatment for AIS, but haven't met the threshold for bracing. Eligibility will be confirmed by the site researcher and information given. Consent/assent will be taken online via a telephone call with the research nurse. Consenting participants will then be randomised to receive either FTB or NTB.

Data will be collected in three phases:

### Phase 1: Pre-skeletal maturity

Whilst in brace, patients will be seen routinely every 6 months for clinical monitoring. Routinely collected spinal radiographs will be taken at each visit in order to measure the Cobb angle (primary outcome). Such radiographs will be sent through the Image Exchange Portal after each routine visit and clinical data entered onto the BSR by research staff. Patients will be emailed a link to the questionnaires in the BSR before the 6 month visit. If not completed, they will use a computer or tablet in the clinic to complete the questionnaires. Questionnaire completion will be checked and chased by mail or telephone as required. If the primary outcome is reached (progression to 50 degrees), follow up pre-skeletal maturity will continue via email link to the BSR which will collect PROMs every 6 months. This will include asking patients if they have received surgery, their quality of life and pain.

"Treatment Switching" will not be encouraged but will be recorded including the reason for crossover. Follow-up will continue unchanged.

### Phase 2: Post-skeletal maturity

Phase 2 follow-up will commence once skeletal maturity is reached (Risser 4 in girls, Risser 5 in boys). It is important to follow-up patients with AIS after skeletal maturity as some curves will continue to progress. If the patient reaches skeletal maturity with a curve below 50 degrees, follow-up will involve spinal radiographs at 12 and 24 months to assess any curve progression. This is part of routine follow-up as recommended by the Scoliosis Research Society.

Questionnaires will be administered by the BSR at 12 and 24 months after skeletal maturity collected by the email link or in the clinic. Again, data will be checked and chased by email or telephone as required.

If the curve progresses to 50 degrees or more, the patient may or may not have surgical treatment. If they don't have surgical treatment, follow-up with spinal radiographs and questionnaires will be done at 12 and 24 months as above, If the patient has surgery, radiographs and questionnaires will be completed at routine post-operative clinic follow-up at 6-8 weeks, 1 year and 2 years after surgery.

### Phase 3: Long-term follow up

If consent is obtained from the patient, follow-up will continue for 10 years after skeletal maturity (i.e. up to 8 years after the end of the trial). This will be funded separately from this current funding award and ethics application.

The project also included a qualitative sub-study, undertaken during the internal pilot phase, to explore patients' and parents' views of the trial recruitment processes and perspectives on the two treatments. This involved in-depth semi-structured interviews with over 20 families at 3-9 months into bracing treatment. This component is now complete, analysis is underway, and we hope that results will be reported soon.

Added 14/05/2024:

#### BASIS 2:

BASIS 2 will run parallel with BASIS as a 'nested' study with no additional clinic visits. There will be one additional hand/wrist x-ray (to determine skeletal age), one additional questionnaire at baseline, and one additional questionnaire at 6 months after randomisation into BASIS2. The study will be completed concurrently with the BASIS study, with both studies reporting their results 2 years after skeletal maturity.

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#### Previous intervention:

The trial will be conducted in 19 large NHS trusts (we currently have 23 potential centres from which 19 will be selected to take part). Patients with AIS will be identified within the clinic setting - these will either be new patients or patients that are already seeking treatment for AIS, but haven't met the threshold for bracing. Eligibility will be confirmed by the site researcher and information given. Consent/assent will be taken online via a telephone call with the research nurse. Consenting participants will then be randomised to receive either FTB or NTB.

#### Data will be collected in three phases:

##### Phase 1: Pre-skeletal maturity

Whilst in brace, patients will be seen routinely every 6 months for clinical monitoring. Routinely collected spinal radiographs will be taken at each visit in order to measure the Cobb angle (primary outcome). Such radiographs will be sent through the Image Exchange Portal after each routine visit and clinical data entered onto the BSR by research staff. Patients will be emailed a link to the questionnaires in the BSR before the 6 month visit. If not completed, they will use a computer or tablet in the clinic to complete the questionnaires. Questionnaire completion will be checked and chased by mail or telephone as required. If the primary outcome is reached (progression to 50 degrees), follow up pre-skeletal maturity will continue via email link to the BSR which will collect PROMs every 6 months. This will include asking patients if they have received surgery, their quality of life and pain.

"Treatment Switching" will not be encouraged but will be recorded including the reason for crossover. Follow-up will continue unchanged.

##### Phase 2: Post-skeletal maturity

Phase 2 follow-up will commence once skeletal maturity is reached (Risser 4 in girls, Risser 5 in boys). It is important to follow-up patients with AIS after skeletal maturity as some curves will continue to progress. If the patient reaches skeletal maturity with a curve below 50 degrees, follow-up will involve spinal radiographs at 12 and 24 months to assess any curve progression. This is part of routine follow-up as recommended by the Scoliosis Research Society. Questionnaires will be administered by the BSR at 12 and 24 months after skeletal maturity collected by the email link or in the clinic. Again, data will be checked and chased by email or telephone as required.

If the curve progresses to 50 degrees or more, the patient may or may not have surgical treatment. If they don't have surgical treatment, follow-up with spinal radiographs and questionnaires will be done at 12 and 24 months as above, If the patient has surgery, radiographs and questionnaires will be completed at routine post-operative clinic follow-up at 6-8 weeks, 1 year and 2 years after surgery.

### Phase 3: Long-term follow up

If consent is obtained from the patient, follow-up will continue for 10 years after skeletal maturity (i.e. up to 8 years after the end of the trial). This will be funded separately from this current funding award and ethics application.

The project also includes a qualitative sub-study, which will be undertaken during the internal pilot to explore patients' and parents' views of the trial recruitment processes and perspectives on the two treatments. This aspect will involve in-depth semi-structured interviews with a purposive sample of 20-30 patient-parent dyads at 3-9 months into bracing treatment. Families will be purposively sampled to encompass diversity in key characteristics and a small sub-set of families who decline to take part in BASIS will also be interviewed. Interviews will be audio-recorded, transcribed and analysed using qualitative techniques.

### Intervention Type

Device

### Phase

Not Applicable

### Drug/device/biological/vaccine name(s)

Back brace

### Primary outcome(s)

1. Curve progression is measured using the Cobb angle (measured from x-ray), every 6 months, before skeletal maturity, and then at 1 and 2 years post skeletal maturity.

Added 14/05/2024:

BASIS 2:

Curve progression from baseline to 2 years after skeletal maturity, in degrees. These will be assessed by the Central Measurement Team.

### Key secondary outcome(s)

1. Quality of life is measured using the Scoliosis Research Society 22 questionnaire, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.
2. Health related quality of life is measured using the CHU9D questionnaire, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.
3. Psychological effects of bracing is measured using the Bad Sobernheim Stress Questionnaire questionnaire, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.
4. Quality of life is measured using the Revised Children's Anxiety and Depression Scale (RCADS 25) questionnaire, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.
5. Sleep disturbance is measured using the PROMIS Paediatric Sleep Disturbance Short Form 4a tool, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.
6. Sleep-related impairment is measured using the PROMIS Paediatric Sleep Related Impairment Short Form 4a tool, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.
7. Patient satisfaction with their brace treatment is measured using the Modified Client Satisfaction with Device module of the Orthotics and Prosthetics Users' Survey (CSD-OPUS) questionnaire, annually.
8. Education information and attainment is measured using a bespoke questionnaire, once, after

the patient has completed their GCSEs (or equivalent).

9. Patient cost is measured using a bespoke questionnaire to the parents, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.

10. Healthcare resource use is measured using a bespoke questionnaire to the parents, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.

11. School attendance is measured using a bespoke questionnaire to the parents, every 6 months until skeletal maturity, and then at 1 and 2 years post skeletal maturity.

12. Curve progression is measured using x-ray (Cobb angle, curve type, curve apex, Risser sign, in-brace Cobb angle, frontal plane balance, apical vertebral rotation, apical vertebral translation), every 6 months until skeletal maturity.

13. In brace correction is measured by Orthotist assessment every 6 months until skeletal maturity.

14. Brace compliance is measured by a wear-time sensor inserted into the brace, and data is collected on a continuous basis, and downloaded when each brace is removed.

15. Complications and serious adverse events are recorded throughout the study.

Added 14/05/2024:

BASIS 2:

Patient bracing experience, and any preferences for full-time or night-time bracing, measured using the Skeletal Maturity Bracing Questionnaire at baseline

### **Completion date**

31/10/2032

## **Eligibility**

### **Key inclusion criteria**

1. Children (10–15 years old inclusive) with a diagnosis of AIS; (some patients recruited at age 15 may be 19 years old by the time they have completed their 2 years after skeletal maturity follow-up)

2. Risser 0, 1 or 2

3. Curve size (Cobb angle) between 20 and 40 degrees inclusive at baseline

4. Curve apex at or below T7

5. Participants and their parent/legal guardian must have a good understanding of the English language to ensure they understand what is required as part of the trial

Added 14/05/2024:

BASIS 2:

1. Participants enrolled on the BASIS study

2. RAC confirms skeletal maturity (Risser 4 in girls, Risser 5 in boys) with a Cobb angle less than 50°

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

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Child

**Lower age limit**

10 years

**Upper age limit**

15 years

**Sex**

All

**Total final enrolment**

0

**Key exclusion criteria**

1. Secondary causes of scoliosis (i.e. neurological abnormalities and abnormal imaging)
2. Previous bracing or spinal surgery
3. Child or parent is unable to adhere to trial procedures or complete follow-up

**Date of first enrolment**

10/11/2021

**Date of final enrolment**

31/10/2026

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

United Kingdom

England

Northern Ireland

Scotland

Wales

**Study participating centre****Sheffield Children's Hospital**

Sheffield Children's NHS Foundation Trust

Western Bank

Sheffield

England

S10 2TH

**Study participating centre****Alder Hey Children's Hospital**

East Prescott Road

Liverpool  
England  
L14 5AB

**Study participating centre**  
**The Royal Orthopaedic Hospital**  
Bristol Road South  
Northfield  
Birmingham  
England  
B31 2AP

**Study participating centre**  
**University Hospital of Wales**  
Heath Park  
Cardiff  
Wales  
CF14 4XW

**Study participating centre**  
**Evelina London Children's Hospital**  
Guys & St Thomas' NHS Foundation Trust  
Westminster Bridge Road  
London  
England  
SE1 7EH

**Study participating centre**  
**Queens Medical Centre, Nottingham University Hospital**  
Derby Road  
Nottingham  
England  
NG7 2UH

**Study participating centre**  
**Norfolk & Norwich University Hospital**  
Colney Lane  
Colney  
Norwich  
England  
NR4 7UY

**Study participating centre**  
**Royal London Hospital**  
Whitechapel Road  
Whitechapel  
London  
England  
E1 1BB

**Study participating centre**  
**St Georges Hospital**  
Blackshaw Road  
London  
England  
SW17 0QT

**Study participating centre**  
**The Royal Victoria Infirmary**  
Queen Victoria Road  
Newcastle upon Tyne  
England  
TS1 4LP

**Study participating centre**  
**Oxford University Hospitals NHS Foundation Trust**  
John Radcliffe Hospital  
Headley Way  
Headington  
Oxford  
England  
OX3 9DU

**Study participating centre**  
**Bristol Royal Hospital for Sick Children**  
St. Michaels Hill  
Bristol  
England  
BS2 8BJ

**Study participating centre**  
**Royal Stoke University Hospital**  
Newcastle Road  
Stoke-on-trent  
England  
ST4 6QG

**Study participating centre**  
**Musgrave Park Hospital**  
Stockmans Ln  
Belfast  
Northern Ireland  
BT9 7JB

**Study participating centre**  
**Taunton Hospital**  
Musgrove Park Hospital  
Taunton  
England  
TA1 5DA

**Study participating centre**  
**The James Cook University Hospital**  
Marton Road  
Middlesbrough  
England  
TS4 3BW

**Study participating centre**  
**Royal Manchester Childrens Hospital**  
Hospital Road  
Pendlebury  
Swinton  
Manchester  
England  
M27 4HA

**Study participating centre**  
**Royal National Orthopaedic Hospital**  
Brockley Hill  
Stanmore

England  
HA7 4LP

**Study participating centre**

**Southampton**

Southampton General Hospital  
Tremona Road  
Southampton  
England  
SO16 6YD

**Study participating centre**

**Leeds General Infirmary**

Great George Street  
Leeds  
England  
LS1 3EX

**Study participating centre**

**Royal Hospital for Children and Young People**

50 Little France Crescent  
Edinburgh  
Lothian  
Scotland  
EH16 4TJ

**Study participating centre**

**Great Ormond Street Hospital**

Great Ormond Street  
London  
England  
WC1N 3JH

## **Sponsor information**

**Organisation**

Sheffield Children's NHS Foundation Trust

**ROR**

https://ror.org/02md8hv62

## Funder(s)

### Funder type

Government

### Funder Name

NIHR Evaluation, Trials and Studies Co-ordinating Centre (NETSCC); Grant Codes: NIHR131081

### Funder Name

National Institute for Health Research (NIHR) (UK)

### 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

#### 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="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Participant information sheet</a>	version 2.4	08/08/2022	30/05/2023	No	Yes
<a href="#">Participant information sheet</a>	version 1.2	08/02/2022	30/05/2023	No	Yes
<a href="#">Participant information</a>	version 2.2		30/05		

<a href="#">sheet</a>		08/02/2022	/2023	No	Yes
<a href="#">Participant information sheet</a>	BASIS 2 (aged 16 years and over) version 1.0	25/03/2024	14/05/2024	No	Yes
<a href="#">Participant information sheet</a>	BASIS 2 (parent) version 1.0	25/03/2024	14/05/2024	No	Yes
<a href="#">Participant information sheet</a>	Participant information sheet version 4.0	11/11/2025	11/11/2025	No	Yes
<a href="#">Protocol file</a>		25/01/2024	14/05/2024	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes