ISRCTN17997749 https://doi.org/10.1186/ISRCTN17997749

A clinical trial to find out the best management of the bacteria called Staphylococcus aureus infection in the blood. A randomised clinical trial. Staphylococcus aureus Network Adaptive Platform trial (SNAP)

Submission date
03/12/2022

Recruitment status
Enrolling by Invitation

Registration date
05/09/2023

Overall study status
Ongoing

Last Edited
05/08/2026

Condition category
Infections and Infestations

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Bacteraemia is a dangerous condition occurring when bacteria enter someone's blood (infection in the blood). Bacteria called Staphylococcus aureus (S. aureus) can cause S. aureus bacteraemia (SAB). Up to a third of people with SAB die within 3 months, even when treated with antibiotics. The aim of the research is to find out which treatments for this illness are best and if we can reduce the number of deaths from this disease.
The sort of questions we want to answer are:
1. What is the best main antibiotic treatment for S. aureus bacteraemia? This is being explored in a part of the trial (domain) called the 'backbone' (or main) antibiotic.
2. Once patients are feeling better, do we need to continue antibiotics via a drip (usually in the hospital), or could we give patients tablet antibiotics to take at home instead? This domain is called 'early oral switch', where some people are moved to tablet antibiotic(s) early.
3. Will giving participants a PET/CT scan while they are in the hospital result in better-tailored treatment for their S. aureus
infection?

Who can participate?
Inpatients (by invitation only) infected with Staphylococcus aureus. 1200 patients are expected to participate in the UK alone - the global trial is larger and many countries are working together to deliver this trial.

What does the study involve?
To work out which medicine is best researchers use clinical trials called a randomised controlled trial (RCT). The treatments (such as an antibiotic) or tests (such as a scan) are chosen randomly (like the flip of a coin) and one person may receive more than one intervention. The same patient can be in more than one part of the trial. In this trial the drugs used are already licensed

drugs used around the world to treat patients with this disease. The scans used are already used in the care of patients.
This is an international adaptive study so the researchers analyse the results as the study goes on rather than just at the end. If the results show any of the treatments do not work as well as others, they will be removed from the study. Similarly, new arms may be added. The initial length of the trial is 4 and a half years. Each person would be in the trial for 3 months with their data collected & stored longer.

What are the possible benefits and risks of participating?
Benefits:
Participants may or may not personally benefit from their participation in this trial. However, we hope that the trial results will contribute to the advancement of scientific knowledge in this field and help us find better treatments for patients with S. aureus.

Risks:
This trial is considered to be relatively low risk due to the fact that all of the interventions are already known treatments or diagnostic tests for S. aureus blood infections. No matter what arm participants are randomised to, they will be receiving treatments or tests that are already licensed in the UK and known to be safe.
However, as with any interventions, there are still risks, and there are a number of possible side effects in particular relation to antibiotic treatment. The patient information sheet highlights that while risks are low with already licensed medications, these can still occur and outline some of the likely side effects. Where the combination of antibiotics may increase particular risks, this is highlighted in the patient information sheet, and details are provided on the additional monitoring that will be undertaken as a result.
Data privacy poses another potential risk; however, this will be kept to a minimum through use of a secure database with tightly regulated access. Participant data will be pseudonymised before being entered into the study database, and during the trial this will only be viewable by the study site and the central trial and data managers. Any directly identifiable data will be restricted to the study site team, and to monitors to facilitate data checks.
Due to the severity of the infection, consent by the participant's authorised representative may be needed. In this situation the patient may have been consented to a study that they might not have consented to themselves. All patients will be approached to give their own consent as soon as feasibly possible in their recovery, and may withdraw their participation if they choose at any time in the trial.

Where is the study run from?
University College London Innovative Clinical Trials Unit, London (UK)

When is the study starting and how long is it expected to run for?
November 2023 to December 2029

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

Who is the main contact?
Professor Anna Goodman: anna.goodman@nhs.net, mrcctu.snap@ucl.ac.uk

Contact information

Type(s)

Scientific

Contact name
Prof Anna Goodman

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Additional identifiers

ClinicalTrials.gov (NCT)
NCT05137119

Clinical Trials Information System (CTIS)
2022-001238-13

Integrated Research Application System (IRAS)
1005342

Central Portfolio Management System (CPMS)
58551

Protocol serial number
CT19029

Study information

Scientific Title
Staphylococcus aureus Network Adaptive Platform trial (SNAP)

Acronym
SNAP

Study objectives
The objective of SNAP is to identify the effect of a range of clinical interventions on all-cause 90-day mortality in patients with Staphylococcus aureus bacteraemia (SAB)

Ethics approval required
Ethics approval required

Ethics approval(s)

Approved 30/08/2023, London – Hampstead Research Ethics Committee (2 Redman Place, Stratford, London, E20 1JQ, United Kingdom; +44 207 104 8248; hampstead.rec@hra.nhs.uk), ref: 23/LO/0033

Primary study design
Interventional

Study design
Interventional randomized controlled adaptive platform trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Staphylococcus aureus bacteraemia

Interventions
SNAP is a multicentre, pragmatic, multi-arm, open-label adaptive platform trial that aims to identify the effects of a range of clinical interventions on patients with Staphylococcus aureus bacteraemia (SAB) in order to improve clinical outcomes. Participants will be randomly assigned to 1 arm within each domain for which they are eligible using a web-based module.

Currently available domains as of 05/08/2026:

Antibiotic Backbone Domain (Adults):
If the participant is deemed eligible, they will be randomised within silos based on the antimicrobial susceptibility.
For MRSA, they will be randomised to:
1. Combination of usual care (vancomycin or daptomycin) plus cefazolin (7 days) - In addition to standard treatment an intravenous β-lactam will be added for the first 7 calendar days following randomisation (day 1 being the day of randomisation - hence patients will receive 6-7 days of β-lactam). This β-lactam will be intravenous cefazolin 2 g every 8 h.
2. Usual care alone

Antibiotic Backbone Domain (Paediatric):
If the participant is deemed eligible they will be randomised within silos based on the antimicrobial susceptibility.
For MSSA or PSSA, they will be randomised to:
1. Cefazolin 50 mg/kg/dose up to 2 g max dose every 8 hours intravenously
2. (Flu)cloxacillin 50 mg/kg/dose up to 2 g max dose every 6 hours intravenously

For MRSA, they will be randomised to:
1. Combination of usual care (vancomycin or daptomycin) plus cefazolin (7 days) - In addition to standard treatment an intravenous β-lactam will be added for the first 7 calendar days following randomisation (day 1 being the day of randomisation - hence patients will receive 6-7 days of β-lactam). This β-lactam will be intravenous cefazolin up to 2g max dose every 8 hours intravenously.
2. Usual care alone

Early Oral Switch Domain (Adult participants only):
If the participant is deemed eligible, and clinically stable at Day 7 or 14, they will be randomised

to receive either:
1. Oral antibiotic regimen - Switch from intravenous backbone antibiotic for MRSA or MSSA or PSSA to oral antibiotics at the treating clinician's discretion on trial Day 7 (+/- 2 days) or trial Day 14 (+/- 2 days).
2. Continued intravenous antibiotic therapy.

PET/CT Domain (Adult participants only):
If the participant is deemed eligible at Day 7, they will be randomised to:
1. Usual care with FDG PET/CT
2. Usual care with no PET/CT

Previous domains:
The trial continues but previous interventions are described below as they were at the time of the domains being active.

Adjunctive Treatment Domain:
If the participant is deemed eligible they will be randomised to receive either:
1. Usual care plus clindamycin (5 days) - Intravenous clindamycin (or lincomycin) 600 mg every 8 h for 5 days.
2. Usual care alone
This closed to recruitment in July 2025

Antibiotic Backbone Domain:
If the participant is deemed eligible they will be randomised within silos based on the antimicrobial susceptibility. This domain remains open but some parts have been closed to recruitment in June 2024 with the results published in June 2026.

Adults with PSSA bacteraemia were randomised to either:
1. Benzylpenicillin - Intravenous benzylpenicillin 1.8 g (3 million units) every 4 or 6 h. The minimum protocol duration of allocated study treatment is 14 days for those not allocated to early oral switch, and 5 days for those allocated to early oral switch.
2. (Flu)cloxacillin - Either intravenous flucloxacillin/cloxacillin 2 g every 4 or 6 h. The minimum protocol duration of allocated study treatment is 14 days for those not allocated to early oral switch, and 5 days for those allocated to early oral switch.

Adults with MSSA bacteraemia were randomised to either:
1. Cefazolin - Intravenous cefazolin 2 g every 6 or 8 h. The minimum protocol duration of allocated study treatment is 14 days for those not allocated to early oral switch, and 5 days for those allocated to early oral switch.
2. (Flu)cloxacillin - as above

Paediatric participants in the Early Oral Switch Domain: This continues in adults as detailed above.

Intervention Type
Drug

Phase
Phase IV

Drug/device/biological/vaccine name(s)

Benzylpenicillin, cefazolin, flucloxacillin, vancomycin, daptomycin, clindamycin, amoxicillin, flucloxacillin, cefalexin, linezolid, moxifloxacin, ciprofloxacin, levofloxacin, rifampicin, trimethoprim plus sulfamethoxazole (TMP+SMX), fusidic acid, clindamycin, co-amoxiclav, fludeoxyglucose (18F)

Primary outcome(s)

Current primary outcome as of 06/05/2026:
All-cause mortality at 90 days after platform entry determined through a search of hospital databases for a record of a participant's death, or follow-up contact with the participant's community healthcare provider, or follow-up contact with the patient or their nominated carer, or linkage with death registries.

The paediatric composite outcome will include a composite of 4 variables collected as secondary outcomes across the trial. The chosen outcomes include mortality, markers of relapse and extended hospitalisation.

Previous primary outcome:
All-cause mortality at 90 days after platform entry determined through a search of hospital databases for a record of a participant's death, or follow-up contact with the participant's community healthcare provider, or follow-up contact with the patient or their nominated carer, or linkage with death registries.

Key secondary outcome(s)

Current key secondary outcomes as of 06/05/2026:
1. All-cause mortality at 14, 28 and 42 days after platform entry
2. Duration of survival censored at 90 days after platform entry
3. Length of stay of acute index inpatient hospitalisation for those surviving until hospital discharge (excluding HITH/COPAT/OPAT/rehab), truncated at 90 days after platform entry. Acute index hospitalisation is defined as a continuous admission to an inpatient healthcare facility where the patient was recruited
4. Length of stay of total index hospitalisation for those surviving until hospital discharge (including HITH/COPAT/OPAT/rehab), truncated at 90 days after platform entry. Total index hospitalisation is defined as a continuous admission to any healthcare facility, including rehabilitation hospitals, and hospital-in-the-home or outpatient parenteral antimicrobial therapy services
5. Time to being discharged alive from the total index hospitalisation (including HITH/COPAT /OPAT/rehab), truncated at 90 days after platform entry (and all deaths within 90 days will be considered '90 days')
6. Microbiological treatment failure, defined as positive sterile site culture for S. aureus [of the same silo as the index isolate] between 14 and 90 days after platform entry. A sterile site means any sites deep to the skin and skin structures, including deep visceral and musculoskeletal abscesses that have been obtained in a sterile manner.
7. Diagnosis of new foci between 14 and 90 days after platform entry. The presence of new foci will be determined by the site investigator and can incorporate clinical, radiological, microbiological and pathological findings.
8. C. difficile diarrhoea as determined by a clinical laboratory in the 90 days following platform entry for participants ≥2 years of age. This means a stool submitted to a clinical laboratory has tested positive for C. difficile toxin or toxin gene.
9. Serious adverse reactions (SARs) in the 90 days following platform entry
10. Health economic costs up to 1 year, as detailed in the health economics appendix
11. Proportion of participants who have returned to their usual level of function at day 90, as

determined by whether the modified functional bloodstream infection score (FBIS) remained the same or improved between baseline and 90 days after platform entry

Secondary outcomes forming the paediatric composite outcome:
1. Mortality by Day 90 following platform entry
2. Microbiological treatment failure, defined as a positive sterile site culture for S. aureus (of the same silo as the index isolate) between 14 and 90 days after platform entry
3. Diagnosis of new foci between 14 and 90 days after platform entry
4. Length of total index hospitalisation of >30 days from the time of platform entry. Total index hospitalisation is defined as a continuous admission to any healthcare facility, including rehabilitation hospitals, and hospital-in-the-home or outpatient parenteral antimicrobial therapy services.
(If an event is observed in any of the four above endpoints, then the composite endpoint will be considered to have been met)

Previous key secondary outcomes:
1. All-cause mortality at 14, 28 and 42 days after platform entry
2. Duration of survival censored at 90 days after platform entry
3. Length of stay of acute index inpatient hospitalisation for those surviving until hospital discharge (excluding HITH/COPAT/OPAT/rehab), truncated at 90 days after platform entry. Acute index hospitalisation is defined as a continuous admission to an inpatient healthcare facility where the patient was recruited
4. Length of stay of total index hospitalisation for those surviving until hospital discharge (including HITH/COPAT/OPAT/rehab), truncated at 90 days after platform entry. Total index hospitalisation is defined as a continuous admission to any healthcare facility, including rehabilitation hospitals, and hospital-in-the-home or outpatient parenteral antimicrobial therapy services
5. Time to being discharged alive from the total index hospitalisation (including HITH/COPAT /OPAT/rehab), truncated at 90 days after platform entry (and all deaths within 90 days will be considered ’90 days’)
6. Microbiological treatment failure, defined as positive sterile site culture for S. aureus [of the same silo as the index isolate] between 14 and 90 days after platform entry. A sterile site means any sites deep to the skin and skin structures, including deep visceral and musculoskeletal abscesses that have been obtained in a sterile manner.
7. Diagnosis of new foci between 14 and 90 days after platform entry. The presence of new foci will be determined by the site investigator and can incorporate clinical, radiological, microbiological and pathological findings.
8. C. difficile diarrhoea as determined by a clinical laboratory in the 90 days following platform entry for participants ≥2 years of age. This means a stool submitted to a clinical laboratory has tested positive for C. difficile toxin or toxin gene.
9. Serious adverse reactions (SARs) in the 90 days following platform entry
10. Health economic costs up to 1 year, as detailed in the health economics appendix
11. Proportion of participants who have returned to their usual level of function at day 90, as determined by whether the modified functional bloodstream infection score (FBIS) remained the same or improved between baseline and 90 days after platform entry

Completion date
31/12/2029

Eligibility

Key inclusion criteria
1. Staphylococcus aureus complex grown from ≥1 blood culture
2. Admitted to participating hospital at anticipated time of eligibility assessment
3. Appropriate consent has been obtained for the patient's participation in the trial

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
All

Sex
All

Total final enrolment
0

Key exclusion criteria
Current exclusion criteria as of 04/08/2026:
1. Time of anticipated platform entry is greater than 72 h post collection of the index blood culture
2. Polymicrobial bacteraemia, defined as more than one organism (at species level) in the index blood cultures, excluding those organisms judged to be contaminants by the treating clinicians
3. Known previous participation in SNAP
4. Known positive blood culture for S. aureus (of the same silo: PSSA, MSSA or MRSA) between 72 h and 180 days prior to the time of eligibility assessment
5. Treating team deems enrolment in the study is not in the best interest of the patient
6. Treating clinician believes that death is imminent and inevitable
7. Patient is for end-of-life care and antibiotic treatment is considered not appropriate
8. Patient <18 years of age and paediatric recruitment not approved at recruiting site
9. Patient has died since the collection of the index blood culture

Previous exclusion criteria:
1. Time of anticipated platform entry is greater than 72 h post collection of the index blood culture
2. Polymicrobial bacteraemia, defined as more than one organism (at species level) in the index blood cultures, excluding those organisms judged to be contaminants by the treating clinicians
3. Patient currently being treated with a systemic antibacterial agent that cannot be ceased or substituted for interventions allocated within the platform (unless antibiotic is listed in Table 1, which specifies allowed antibiotics with limited absorption from the gastrointestinal tract or negligible antimicrobial activity against S. aureus)
4. Known previous participation in SNAP
5. Known positive blood culture for S. aureus (of the same silo: PSSA, MSSA or MRSA) between 72 h and 180 days prior to the time of eligibility assessment
6. Treating team deems enrolment in the study is not in the best interest of the patient
7. Treating clinician believes that death is imminent and inevitable

8. Patient is for end-of-life care and antibiotic treatment is considered not appropriate
9. Patient <18 years of age and paediatric recruitment not approved at recruiting site
10. Patient has died since the collection of the index blood culture

Date of first enrolment
27/11/2023

Date of final enrolment
30/06/2027

Locations

Countries of recruitment
United Kingdom

England

Scotland

Wales

Australia

Canada

Germany

Israel

Japan

Malaysia

Netherlands

New Zealand

Singapore

United States of America

Study participating centre
Barts Health NHS Trust
The Royal London Hospital
80 Newark Street
London
England
E1 2ES

Study participating centre
Bristol Royal Hospital for Children
Upper Maudlin Street
Bristol
England
BS2 8BJ

Study participating centre
University Hospitals Sussex NHS Foundation Trust
Worthing Hospital
Lyndhurst Road
Worthing
England
BN11 2DH

Study participating centre
University Hospitals Bristol and Weston NHS Foundation Trust
Trust Headquarters
Marlborough Street
Bristol
England
BS1 3NU

Study participating centre
Cardiff & Vale University Lhb
Woodland House
Maes-y-coed Road
Cardiff
Wales
CF14 4HH

Study participating centre
Guy's and St Thomas' NHS Foundation Trust
St Thomas' Hospital
Westminster Bridge Road
London
England
SE1 7EH

Study participating centre

Hull University Teaching Hospitals NHS Trust
Hull Royal Infirmary
Anlaby Road
Hull
England
HU3 2JZ

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

Study participating centre
NHS Lothian
Waverley Gate
2-4 Waterloo Place
Edinburgh
Scotland
EH1 3EG

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

Study participating centre
Liverpool University Hospitals NHS Foundation Trust
Royal Liverpool University Hospital
Prescot Street
Liverpool
England
L7 8XP

Study participating centre

Manchester University NHS Foundation Trust
Cobbett House
Oxford Road
Manchester
England
M13 9WL

Study participating centre
North Bristol NHS Trust
Southmead Hospital
Southmead Road
Westbury-on-trym
Bristol
England
BS10 5NB

Study participating centre
The Newcastle upon Tyne Hospitals NHS Foundation Trust
Freeman Hospital
Freeman Road
High Heaton
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NE7 7DN

Study participating centre
Oxford University Hospitals
John Radcliffe Hospital
Headley Way
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Oxford
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OX3 9DU

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

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SO16 6YD

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Mindelsohn Way
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B15 2GW

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Whittington Health NHS Trust
The Whittington Hospital
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N19 5NF

Study participating centre
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James Cook University Hospital
Marton Road
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Sponsor information

Organisation
University College London

ROR
https://ror.org/02jx3x895

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
Research teams may approach the SNAP leadership with a formal data sharing request detailing the specific requirement, proposed research, qualification of researchers and publication plan if

they are interested in using SNAP data. The request will be reviewed by the International Trial Steering Committee. If approved and once any additional ethics has been obtained data would be shared. Any data transfer will be anonymised, and considerations will be taken if non-aggregated data is requested. All participants will be consented for future use of their data.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		17/06/2026	04/08/2026	Yes	No
Results article		17/06/2026	05/08/2026	Yes	No