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# Biomarker-guided duration of antibiotic treatment for sepsis

**Submission date**
06/07/2017

**Recruitment status**
No longer recruiting

**Registration date**
14/07/2017

**Overall study status**
Completed

**Last Edited**
16/01/2025

**Condition category**
Infections and Infestations

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

## Plain English summary of protocol

Background and study aims
Sepsis is a common life-threatening condition that is triggered by infection. In sepsis, the body's defence mechanisms (immune system) react excessively, resulting in widespread inflammation and swelling. If not treated quickly, sepsis can result in shutdown of vital organs which can result in death. Each year in the UK, about 200,000 people develop sepsis and up to a quarter will die. Previous research indicates that early recognition of sepsis and rapid antibiotic treatments are the most important factors for patient survival. While starting antibiotics for sepsis is crucial, the recommended duration of such treatment is uncertain. The lack of research on when to stop treatment safely can lead to an overuse of antibiotics in this condition. Antibiotic overuse is important because it promotes bacteria that are resistant to antibiotics (antimicrobial resistance), which means that sepsis and, indeed, other infections would become difficult to treat in the future. Shorter courses of antibiotics for a patient with sepsis, if given appropriately, may result in less antibiotic use resulting in fewer side effects, less risk of antibiotic resistance and a reduction in costs. Chemicals circulating in the blood can indicate the level of an infection and how effective the treatment of an infection is. These chemicals are called biomarkers. The two most well researched circulating biomarkers in sepsis are C-reactive protein (CRP) and procalcitonin (PCT). They are both protein chemicals produced by the human body in response to infection and can be readily measured in blood samples using NHS laboratory equipment. The aim of this study is to find out whether the duration of antibiotic treatment given to patients with sepsis can be safely reduced following the close daily monitoring of these biomarkers. A number of studies around the world have shown high levels of both CRP and PCT in the blood of patients with sepsis and that they can fall to low levels during a spell of antibiotics. While these studies suggest that these biomarkers could help determine when to stop antibiotics in sepsis, no studies have been performed to test such strategies for NHS patients.
This study has received Urgent Public Health (UPH) status from the National Institute for Health Research (NIHR).

Who can participate?
Patients aged 18 and over with sepsis

What does the study involve?
Participants are randomly allocated to one of three treatments: a standard antibiotic treatment

course (usually about 7 days), or treatment courses based on the addition of either daily CRP measurement or daily PCT measurement. All biomarker measurements are performed on one extra daily blood sample as part of usual care. The results are used to provide advice to the patient's treating team about when to stop antibiotics. To assure patient safety, the final decision to stop antibiotics rests entirely with the treating team and an independent Monitoring Committee scrutinises study progress. The duration of antibiotic treatment and mortality (death rates) in the three groups are compared over 28 days.

What are the possible benefits and risks of participating?
Individual patients are unlikely to benefit from participating in this study. The aim is to build evidence to guide the duration (how many days it should be taken for) of antibiotic treatment for patients with sepsis. If the number of days that it is necessary to give antibiotic treatment can be safely reduced, individual patients may benefit from the possibility of fewer days suffering from the known side effects of antibiotic treatment and a reduced risk of building up resistance to antibiotics working in the future (antimicrobial resistance). Patients continue to receive standard clinical treatment, and their clinicians continue to decide on how long antibiotic treatment is given. An additional 1 teaspoon of blood (5 ml) is taken daily during antibiotic treatment. The amount of additional blood is small and is taken, in most cases, from an arterial or venous tube at the same time as blood required for routine clinical care. In exceptional cases, blood sampling is from a vein using a needle. There may be a sharp scratch when the needle is inserted and possible bruising from the area from which the blood is taken.

Where is the study run from?
Warwick Clinical Trials Unit (UK)

When is the study starting and how long is it expected to run for?
May 2017 to January 2025

Who is funding the study?
Health Technology Assessment Programme (UK)

Who is the main contact?
Prof. Paul Dark, paul.m.dark@manchester.ac.uk

# Contact information

### Type(s)
Scientific


### Contact name
Prof Paul Dark

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# Additional identifiers

### Integrated Research Application System (IRAS)
209815

### ClinicalTrials.gov (NCT)
Nil known

### Protocol serial number
IRAS (UK) 209815, IRAS (Scotland) 234179, HTA 15/99/02

# Study information

### Scientific Title
Multicentre randomised controlled trial in critical care patients using biomarker-guided duration of antibiotic treatment for sepsis: the ADAPT-Sepsis trial

### Acronym
ADAPT-Sepsis

### Study objectives
Hospitalised adult patients already receiving empiric intravenous antibiotics for suspected sepsis, who are treated using an antibiotic discontinuation protocol based on either CRP or PCT, will have safe decreases in antibiotic treatment duration compared with those treated with standard care alone.

### Ethics approval required
Old ethics approval format

### Ethics approval(s)
South Central – Oxford C REC, 20/10/2017, IRAS (UK) 209815, REC Ref: 17/SC/0434, IRAS (Scotland) 234179, REC Ref: 17/SS/0125

### Study design
Randomized controlled multi-centre interventional trial

### Primary study design
Interventional

### Study type(s)
Prevention

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

### Interventions
In-patients receiving Critical Care treatment will be randomised (web-based randomisation) to one of two intervention groups (C-Reactive Protein (CRP) or Procalcitonin (PCT)) guided antibiotic duration) or a standard antibiotic treatment course (control) group (usually about 7 days). Patients continue to receive standard care including antibiotic treatment. Duration to antibiotic discontinuation guidance only.

Patient blood collection (minimum of 2 ml research sample per day) and serum laboratory testing of either CRP, PCT or 'no laboratory test' will commence within the first 24 hours following the initiation of intravenous antibiotics for suspected sepsis and continue daily until antibiotics have been discontinued. Daily standardised written advice on either continuing standard care or on antibiotic discontinuation will be issued to the clinical team, repeated in 24 hour intervals. Advice will be based on daily serum testing.

### Intervention Type
Other

### Primary outcome(s)
1. Primary clinical effectiveness outcome: total duration of antibiotic treatment to 28 days following randomisation (superiority) measured in days (24-hour time periods from randomisation)
2. Primary safety outcome: 28-day all-cause mortality (non-inferiority) following randomisation

### Key secondary outcome(s))
Secondary effectiveness and safety outcome measures to 28 days following randomisation:
1. Antibiotic dose, measured as Defined Daily Dose
2. Unscheduled care escalation/re-admission
3. Infection relapse/recurrence requiring further antibiotic treatment
4. Super-infection, defined as new infection at a different anatomical site
5. Suspected antibiotic adverse reactions
6. Time to 'fit' for hospital discharge

### Completion date
31/01/2025

## Eligibility

### Key inclusion criteria
1. Hospitalised adult patients at least 18 years of age
2. Up to 24 hours of initiation of empiric intravenous antibiotic treatments for a suspicion of sepsis (i.e. "suspected sepsis" – see trial definition below)
3. Likely to remain hospitalised and receiving intravenous antibiotic treatment for at least the next 72 hours
4. Requirement for critical care

Suspected sepsis definition: Within the context of this study, 'suspected sepsis' is defined as 'acute organ dysfunction associated with suspected infection' (1). The trialists do not mandate a definition for 'acute organ dysfunction' and patient information underpinning local clinical decisions will be captured as part of the Case Report Form (CRF) which will include the Sequential Organ Failure Assessment (SOFA) score.

**Participant type(s)**
Patient

**Healthy volunteers allowed**
No

**Age group**
Adult

**Lower age limit**
18 years

**Sex**
All

**Total final enrolment**
2760

**Key exclusion criteria**
Current exclusion criteria as of 05/02/2021:
1. More than 24 h since receiving first empiric intravenous antibiotic treatments for a suspicion of sepsis
2. Prolonged (greater than 21 days) antimicrobial therapy mandated (e.g. for endocarditis, cerebral/hepatic abscess, tuberculosis, osteomyelitis)
3. Severely immunocompromised (e.g. neutropenia, less than 500 neutrophils/µl)
4. All treatment for suspected sepsis likely to be stopped within 24 hours of its initiation because of futility
5. 5. Any patient given, or anticipated to receive an IL-6 receptor inhibitor drug (e.g. tocilizumab or sarilumab) during their acute hospital admission
6. Consent declined
7. Previously enrolled in this trial

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Previous exclusion criteria:
1. More than 24 h since receiving first empiric intravenous antibiotic treatments for a suspicion of sepsis
2. Prolonged (greater than 21 days) antimicrobial therapy mandated (e.g. for endocarditis, cerebral/hepatic abscess, tuberculosis, osteomyelitis)
3. Severely immunocompromised (e.g. neutropenia, less than 500 neutrophils/µl)
4. All treatment for suspected sepsis likely to be stopped within 24 hours of its initiation because of futility
5. Consent declined
6. Previously enrolled in this trial

**Date of first enrolment**
29/01/2018

**Date of final enrolment**
05/06/2024

# Locations

## Countries of recruitment
United Kingdom

England

Scotland

Wales

## Study participating centre
**Salford Royal Hospital**
Stott Lane
Salford
United Kingdom
M6 8HD

## Study participating centre
**Heartlands Hospital**
Heart of England NHS Foundation Trust
Bordesley Green E
Birmingham
United Kingdom
B9 5SS

## Study participating centre
**James Cook University Hospital**
South Tees Hospitals NHS Foundation Trust
Marton Road
Middlesbrough
United Kingdom
TS4 3BW

## Study participating centre
**Aintree Hospital**
Lower Lane
Liverpool
United Kingdom
L9 7AL

**Study participating centre**
**Royal Liverpool University Hospital**
Prescot St
Liverpool
United Kingdom
L7 8XP

**Study participating centre**
**Royal Bolton Hospital**
Minerva Rd
Farnworth
Bolton
United Kingdom
BL4 0JR

**Study participating centre**
**Royal Infirmary of Edinburgh**
51 Little France Cres
Old Dalkeith Rd
Edinburgh
United Kingdom
EH16 4SA

**Study participating centre**
**Freeman Hospital**
Freeman Rd
High Heaton
Newcastle upon Tyne
United Kingdom
NE7 7DN

**Study participating centre**
**Royal Victoria Infirmary**
Queen Victoria Rd
Newcastle upon Tyne
United Kingdom
NE1 4LP

**Study participating centre**
**Gloucestershire Royal Hospital**
Great Western Rd

Gloucester
United Kingdom
GL1 3NN

**Study participating centre**
**Leeds General Infirmary**
Great George St
Leeds
United Kingdom
LS1 3EX

**Study participating centre**
**St James's University Hospital**
Beckett St
Harehills
Leeds
United Kingdom
LS9 7TF

**Study participating centre**
**Manchester Royal Infirmary**
Oxford Rd
Manchester
United Kingdom
M13 9WL

**Study participating centre**
**University Hospital of North Tees**
Hardwick Rd
Hardwick
Stockton-on-Tees
United Kingdom
TS19 8PE

**Study participating centre**
**Nottingham City Hospital**
Hucknall Rd
Nottingham
United Kingdom
NG5 1PB

**Study participating centre**
**Royal Preston Hospital**
Sharoe Green Ln
Fulwood
Preston
United Kingdom
PR2 9HT

**Study participating centre**
**Royal Glamorgan Hospital**
Ynysmaerdy
Pontyclun
United Kingdom
CF72 8XR

**Study participating centre**
**Royal Free Hospital**
Pond St
London
United Kingdom
NW3 2QG

**Study participating centre**
**Royal Victoria Hospital**
Radnor Park Ave
Folkestone
United Kingdom
CT19 5BN

**Study participating centre**
**Russells Hall Hospital**
Pensnett Rd
Dudley
United Kingdom
DY1 2HQ

**Study participating centre**
**Royal Oldham Hospital**
Rochdale Rd

Oldham
United Kingdom
OL1 2JH

**Study participating centre**
**Sunderland Royal Hospital**
Kayll Rd
Sunderland
United Kingdom
SR4 7TP

**Study participating centre**
**University College Hospital**
235 Euston Rd,
London
United Kingdom
NW1 2BU

**Study participating centre**
**Wythenshawe Hospital**
Southmoor Rd
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Manchester
United Kingdom
M23 9LT

**Study participating centre**
**York Hospital**
Wigginton Rd
Clifton
York
United Kingdom
YO31 8HE

# Sponsor information

**Organisation**
University of Manchester

**ROR**
https://ror.org/027m9bs27

# Funder(s)

**Funder type**
Government

**Funder Name**
Health Technology Assessment Programme

**Alternative Name(s)**
NIHR Health Technology Assessment Programme, Health Technology Assessment (HTA), HTA

**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 will be included in the subsequent results 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? |
|---|---|---|---|---|---|
| Results article | | 09/12/2024 | 18/12/2024 | Yes | No |
| Protocol article | | 25/04/2023 | 23/05/2023 | Yes | No |
| HRA research summary | | | 28/06/2023 | No | No |
| HRA research summary | | | 28/06/2023 | No | No |
| Protocol file | version 6.0 | 26/04/2021 | 07/12/2021 | No | No |
| Protocol file | version 7.0 | 25/11/2021 | 30/03/2022 | No | No |
| Protocol file | version 9.0 | 20/03/2023 | 23/05/2023 | No | No |
| Statistical Analysis Plan | version 1.1 | 08/03/2022 | 23/05/2023 | No | No |

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|---|---|---|---|---|---|
| Study website | Study website | 11/11/2025 | 11/11/2025 | No | Yes |