

# Prophylactic antibiotics to prevent chest infections in children with neurological impairment

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<b>Registration date</b> 22/04/2020	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 20/01/2025	<b>Condition category</b> Nervous System Diseases	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Neurological Impairment (NI) can be any disorder of the body's nervous system and can present with a range of symptoms. Many children with NI are prone to chest infections, which can lead to long stays in hospital, and can be life-threatening. Despite the impact on children and their families due to these infections and the high cost to health services, there is very little information on how best to prevent them. Some doctors prescribe long-term antibiotics but it is not known whether this makes any difference to the number of chest infections children suffer from, or whether these antibiotics can cause long-term harm. This study is looking at an antibiotic called azithromycin and aims to find out whether 12 months of treatment with azithromycin reduces how often children with NI have to stay in hospital with chest infections.

### Who can participate?

Children and young people with NI aged 3-17 years

### What does the study involve?

If interested in participating in the study, the caregiver/young person or child will be asked to sign a consent/assent form to confirm this in writing. Once the form is signed, the caregiver will be asked some questions about their child's respiratory health and the site research team will check that the trial remains suitable before starting treatment. Before the participant starts their treatment of either azithromycin or placebo (dummy drug), information will be collected about them, including medical history and school attendance. Their weight will also be recorded and the caregiver will be asked to complete some questionnaires. Once the participant's treatment is dispensed, they will go home and complete the sleep assessment(s). After this has been completed the participant will start their treatment at home. The treatment will be given once daily every Monday, Wednesday and Friday for 12 months and neither the participant, their caregiver or the local clinical team looking after them will know if they are taking azithromycin or placebo. During the 12 months, the site research team will be in touch with the caregiver each month to ask how their child is getting on and if, for example, they have been to see their GP. Usually, this will be by phone or email, however, every 3 months this will be face-to-face so the site research team can provide the caregiver with more of their child's treatment, answer some

questionnaires and record their child's weight. The site research team will try to make these face-to-face follow-ups as easy as possible, for example, by arranging them at the same time as normal clinic visits where possible. There may be an additional face-to-face follow-up visit at 20 months, which will follow a similar format as the other face-to-face follow-up visits. If the participant does not take part in this additional visit, the site research team will ring the caregiver 28 days after their child finishes taking the treatment to check how their child has been since treatment stopped. In addition, if the participant visits their hospital outside of the arranged follow-up visits due to a chest infection, the site research team will also collect some information about this visit.

What are the possible benefits and risks of participating?

Azithromycin is used widely for the treatment of childhood infections. Children and young people who are given azithromycin may benefit from having fewer chest infections. There are very few side effects expected with azithromycin, though some children/young people may get mild diarrhoea and stomach pains and may feel sick (nausea) or be sick (vomit) when they first start taking azithromycin. Other side effects may include headache and feeling dizzy. There is a small chance that azithromycin may cause a rash or hearing problems. For those who are given the placebo there would be no higher risk than taking the antibiotics. If anyone who would like to take part is already taking antibiotics to prevent getting chest infections, then they would need to stop their antibiotics 13 weeks before entry into the trial. It is possible that during this period their respiratory symptoms might worsen. It is hoped that the results from the trial will help doctors and patients in the future when making decisions about treatment.

Where is the study run from?

University of Liverpool (UK)

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

March 2019 to June 2024

Who is funding the study?

1. National Institute for Health Research HTA Programme (UK)
2. National Health and Medical Research Council (NHMRC) (Australia)

Who is the main contact?

Helen Eccleson

parrot@liverpool.ac.uk

**Study website**

<https://parrot-trial.org.uk/>

## Contact information

**Type(s)**

Scientific

**Contact name**

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**Contact details**

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**Additional identifiers****EudraCT/CTIS number**

2019-001508-39

**IRAS number**

263255

**ClinicalTrials.gov number**

Nil known

**Secondary identifying numbers**

CPMS 44576, IRAS 263255, ACTRN12619001597189, Grant Code: 16/17/01

**Study information****Scientific Title**

Joint UK and Australia multicentre, randomised, double-blind, placebo-controlled pragmatic trial comparing 52 weeks of azithromycin to placebo in children with neurological impairment at risk of lower respiratory tract infection (the PARROT trial)

**Acronym**

PARROT

**Study objectives**

To determine whether 52 weeks of azithromycin prophylaxis is more effective than placebo in reducing the proportion of children and young people with non-progressive neurological impairment admitted to hospital with lower respiratory tract infections.

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

Approved 23/03/2020, North West - Liverpool Central Research Ethics Committee (3rd Floor, Barlow House, 4 Minshull Street, Manchester, M1 3DZ, UK; +44 (0)2071048387, +44 (0)207 104 8056; liverpoolcentral.rec@hra.nhs.uk), REC ref: 20/NW/0047

**Study design**

Randomized; Interventional; Design type: Treatment, Drug

### **Primary study design**

Interventional

### **Secondary study design**

Randomised controlled trial

### **Study setting(s)**

Hospital

### **Study type(s)**

Treatment

### **Participant information sheet**

Participant information will be made available via the PARROT website: <http://www.parrot-trial.org.uk>. Please note that the website is not yet live but will be before recruitment starts.

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

Neurological impairment

### **Interventions**

PARROT will be a joint UK and Australian multicentre trial. The primary objective is to determine whether 52 weeks of azithromycin prophylaxis is more effective than placebo in reducing the proportion of children with non-progressive NI admitted to hospital with LRTI.

Study participants will be randomised to either 52 weeks prophylactic azithromycin or placebo in a 1:1 ratio. Both patients and their healthcare teams will be blinded to treatment allocation.

Taking part in the trial will involve phone or email follow-up every month and face-to-face visits every 3 months over a 12 month (52 week) period. Study tests include questionnaires, weight and nasal swabs\*.

Initial visit will involve the assessment of eligibility criteria, including calculation of the LRSQ score, following consent. Once eligibility has been confirmed by a delegated medical practitioner, the patient can be randomised. The baseline visit will measure weight, assess if the patient is taking any concomitant medications and whether they have recently received any vaccinations and will review recent medical history. A series of questionnaires will be completed by the parent/caregiver and by the patient (if capacity allows). A nasal swab\* will also be taken at this visit. Sleep actigraphy will be completed after randomisation, but prior to treatment administration. Study medication will be dispensed at this visit.

Participants will be contacted via email/phone at 1, 2, 4, 5, 7, 8, 10 and 11 months. An assessment of safety events, concomitant medication and changes to respiratory treatment and review of GP, A&E attendances and hospital admissions will be undertaken.

Participants will attend a face-to-face visit at 3, 6 and 9 months. In addition to the assessments performed at the email/phone visits, the parent/caregiver and participant (if capacity allows) will complete study questionnaires and return the completed treatment diary. The participants weight and relevant interventions will also be documented. Study medication will also be dispensed at these face-to-face visits. A nasal swab\* will be taken at the 6-month visit.

Participants will also attend a face-to-face end of study visit at 12 months. In addition to the assessments performed at the face-face-visits, there will be a review of vaccinations and the sleep assessment(s) the parent/caregiver completed at the start of the study will be completed again just before this visit. This is also when treatment finishes and no more treatment will be dispensed. A nasal swab will also be taken at this visit\*.

An additional face-to-face visit will take place at 20 months if recruitment to the trial is still ongoing. Assessments will be the same as those undertaken for the 12-month visit, excluding the sleep assessments and actigraphy. For participants that will not have a 78-week follow-up visit scheduled (as detailed above), a follow-up phone call at 28 days post-treatment will be completed to assess safety events only.

If a participant is hospitalised outside of their arranged follow-up visit due to a chest infection, additional information will be collected about this visit and a cough and nasal swab\* will be collected.

Parents of children with neurological impairment were involved in all stages in the development of this trial. PPI informed the recruitment strategy, inclusion and exclusion criteria and added to the outcomes of the trial. Parent advisors will continue to have a crucial role in ensuring the trial addresses the needs and concerns of families of children with neurological impairment, and information from the trial is made available in formats they find useful.

\*As outlined in the protocol, swabs will be taken for Australian participants only. An amendment will be submitted to include swabs for UK participants once contractual arrangements are in place.

## **Intervention Type**

Other

## **Phase**

Phase III

## **Primary outcome measure**

Proportion of children and young people (3-17 years) hospitalised\* at their recruiting or designated centre with Lower Respiratory Tract Infection (LTRI) over the 52-week intervention period, recorded at 4, 8, 13, 17, 21, 26, 30, 34, 39, 43, 47 and 52 weeks

\*Hospitalisation includes those who are admitted to hospital for only a short period with LTRI e.g. 12 hours and go home with a course of antibiotics. However, if participants are hospitalised again within 2 weeks of the initial admission, this will be classified as the same event

## **Secondary outcome measures**

1. Health-related QoL of child and parent/carer measured using parent QoL assessment (Warwick-Edinburgh Mental Wellbeing Scale) and patient QoL assessment (DISABKIDS) at baseline, 13, 26, 39 and 52 weeks
2. Safety events, tolerability and adherence measured by the assessment of adverse events and withdrawals from study treatment at 4, 13, 17, 21, 26, 30, 34, 39, 43, 47 and 52 weeks, and treatment diary at 13, 26, 39 and 52 weeks
3. Respiratory medication usage assessed by reviewing concomitant medication which could impact the respiratory system at baseline, 4, 8, 13, 17, 21, 26, 30, 34, 39, 43, 47 and 52 weeks, and vaccinations at baseline and 52 weeks

4. Weight based on World Health Organisation z-scores using WHO Anthro calculator (<https://www.who.int/growthref/tools/en>) assessed at baseline, 13, 26, 39 and 52 weeks
5. Quality/amount of parent and child/young person's sleep measured using the primary caregiver sleep actigraphy and corresponding primary caregiver sleep log (UK only), the Child's Sleep Habits Questionnaire and 1 week patient sleep diary at baseline and 52 weeks
6. Respiratory symptoms measured using LRSQ-Neuro score and the respiratory symptom questionnaire at baseline, 13, 26, 39 and 52 weeks, and changes to respiratory treatments /support and surgical/other interventions at 13, 26, 39 and 52 weeks
7. Number, duration and severity of LRTI; time to first LRTI is measured by reviewing the occurrence of chest infection and LRTI, changes to respiratory treatments/support and the assessment of adverse events at 4, 8, 13, 17, 21, 26, 30, 34, 39, 43, 47 and 52 weeks; by using the resource use questionnaire at baseline, 13, 26, 39 and 52 weeks and documenting length of stay in hospital, admission to PICU/HDU and changes to respiratory treatments/support for any unscheduled visits
8. Unscheduled medical presentations (GP visits and A&E attendances) for LRTI measured by reviewing medical history at baseline; reviewing the occurrence of chest infections and LRTIs and the assessment of adverse events at 4, 8, 13, 17, 21, 26, 30, 34, 39, 43, 47 and 52 weeks, and using the resource use questionnaire at baseline, 13, 26, 39 and 52 weeks
9. Use of other health and social care services, school attendance and indirect costs measured using the resource use questionnaire at baseline, 13, 26, 39 and 52 weeks and Hospital Episode Statistics (HES) at 52 weeks
10. Number of courses of 'rescue' antibiotics prescribed for LRTI measured by reviewing concomitant medications which could impact the respiratory system at baseline, 4, 8, 13, 17, 21, 26, 30, 34, 39, 43, 47 and 52 weeks
11. Quality-adjusted life years (QALY) measured using CHU9D and EQ-5D-Y at baseline, 13, 26, 39 and 52 weeks
12. Nasal swab for microbiology and resistance profiling taken at baseline, 26 and 52 weeks, and for unscheduled visits (for Australian participants only until UK contractual arrangements are in place)
13. Nasal swab/nasopharyngeal aspirate to investigate viral causes of acute LRTI (as defined by the protocol) and cough swab/sputum collection to investigate bacterial causes of acute LRTI (as defined by the protocol) taken at unscheduled visits (for Australian participants only until UK contractual arrangements are in place)
14. Residual impact of 52 weeks antibiotic prophylaxis assessed at 78 weeks, using the following measures:
  - 14.1. Respiratory symptoms measured by assessing LRSQ-Neuro score, respiratory symptom questionnaire, changes to respiratory treatments/support and surgical and other interventions
  - 14.2. Weight based on World Health Organisation z-scores using WHO Anthro calculator (<https://www.who.int/growthref/tools/en>)
  - 14.3. Nasal swab for microbiology and resistance profiling
  - 14.4. Changes in respiratory medication usage measured by reviewing concomitant medications which could impact the respiratory system and vaccinations
  - 14.5. Number, duration and severity of LRTI; time to first LRTI measured using the resource use questionnaire and reviewing the occurrence of chest infection and LRTI, changes to respiratory treatments/support and the collection of adverse events
  - 14.6. Quality-adjusted life years (QALY) measured using the CHU9D and EQ-5D-Y
  - 14.7. Use of other health and social care services, school attendance and indirect costs measured using Hospital Episode Statistics (HES)
  - 14.8. Health-related QoL of child and parent/carer measured using the patient QoL assessment (DISABKIDS) and parent QoL assessment (Warwick-Edinburgh Mental Well-being Scale)
  - 14.9. Unscheduled medical presentations (GP visits and A&E attendances) for LRTI measured by reviewing the occurrence of chest infection and LRTI, the collection of adverse events and the

resource use questionnaire

14.10. Number of courses of 'rescue' antibiotics prescribed for LRTI measured by reviewing concomitant medications which could impact the respiratory system

14.11. Safety events measured using the assessment of adverse events

**Overall study start date**

01/03/2019

**Completion date**

04/06/2024

## **Eligibility**

**Key inclusion criteria**

1. Children and young people who are aged between 3-17 years at randomisation
2. Written informed consent from participant (or appropriate person if incapacitated / minor)
3. Participant (or appropriate person if incapacitated / underage) and caregiver have a good understanding of the English language
4. Diagnosed with non-progressive, non-neuromuscular NI\*
5. Persistent respiratory symptoms\*\*
6. One or more of the following:
  - 6.1. Received at least 2 courses of oral antibiotics for LRTI in 52 weeks prior to eligibility
  - 6.2. Have been hospitalised with a LRTI within 52 weeks prior to eligibility and completed 13 week 'washout' period (where applicable)\*\*\*
  - 6.3. Prescribed prophylactic antibiotics for LRTIs and undergone a 13 week 'washout' period\*\*\*

\* Most will likely have cerebral palsy. However, some children may have no formal diagnosis to account for their symptoms.

\*\* Persistent respiratory symptoms defined by LRSQ-Neuro score of  $\geq 95\%$ CI for age

\*\*\* Must have undergone a 13 week 'washout' period where administered IV antibiotics during hospitalisation or have been previously prescribed and administered prophylactic or nebulised antibiotics

**Participant type(s)**

Patient

**Age group**

Child

**Lower age limit**

3 Years

**Upper age limit**

17 Years

**Sex**

Both

**Target number of participants**

Planned Sample Size: 500; UK Sample Size: 350

**Total final enrolment**

90

**Key exclusion criteria**

1. Any neuromuscular disorders including SMA, Duchenne muscular dystrophy etc., or neurological disorders in which progressive deterioration in neurological condition are known to occur (e.g. Rett syndrome, some neurometabolic syndromes)
2. Pre-existing non-neurological conditions that impact respiratory functions such as CF, immunodeficiency etc. Note: Children with NI known to have bronchiectasis will not be excluded
3. Known contra-indication to using or hypersensitivity to azithromycin, erythromycin, macrolide or ketolide antibiotic or to any of the excipients contained in the study drug
4. Use of macrolide antibiotics within 90 days prior to eligibility
5. Known significant hepatic disease (hepatic impairment per Child-Pugh classification C)
6. Treatment with ergot derivatives (dihydroergocristine, dihydroergotamine, dihydroergotoxine, nicergoline or a combination of dihydroergocryptine with caffeine)
7. Child/young person already taking prophylactic antibiotics for non-respiratory causes (e.g. UTIs)
8. Previously randomised in PARROT
9. Recruited to another IMP trial and continuing to administer the IMP

**Date of first enrolment**

18/03/2022

**Date of final enrolment**

31/05/2023

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

Australia

England

Scotland

United Kingdom

**Study participating centre**

**Alder Hey Children's NHS Foundation Trust**

Alder Hey Hospital

Eaton Road

West Derby

Liverpool

United Kingdom

L12 2AP

**Study participating centre**



**The Newcastle Upon Tyne Hospitals NHS Foundation Trust**

Freeman Hospital  
Freeman Road  
High Heaton  
Newcastle-upon-Tyne  
United Kingdom  
NE7 7DN

**Study participating centre**

**East London NHS Foundation Trust**

9 Alie Street  
Aldgate  
London  
United Kingdom  
E1 8DE

**Study participating centre**

**Barts Health NHS Trust**

The Royal London Hospital  
Whitechapel  
London  
United Kingdom  
E1 1BB

**Study participating centre**

**NHS Grampian**

Summerfield House  
2 Eday Road  
Aberdeen  
United Kingdom  
AB15 6RE

**Study participating centre**

**NHS Tayside**

Ninewells Hospital and Medical School  
James Arrott Drive  
Dundee  
United Kingdom  
DD1 9SY

**Study participating centre**

**NHS Lothian**  
Waverley Gate  
2-4 Waterloo Place  
Edinburgh  
United Kingdom  
EH1 3EG

**Study participating centre**

**NHS Lanarkshire**  
14 Beckford Street  
Hamilton  
United Kingdom  
ML3 0TA

**Study participating centre**

**County Durham and Darlington NHS Foundation Trust**  
Darlington Memorial Hospital  
Hollyhurst Road  
Darlington  
United Kingdom  
DL3 6HX

**Study participating centre**

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

**Study participating centre**

**North Tees and Hartlepool NHS Foundation Trust**  
University Hospital Of Hartlepool  
Holdforth Road  
Hartlepool  
United Kingdom  
TS24 9AH

**Study participating centre**

**Manchester University NHS Foundation Trust**  
Cobbett House

Oxford Road  
Manchester  
United Kingdom  
M13 9WL

**Study participating centre**

**Wirral University Teaching Hospital NHS Foundation Trust**

Arrowe Park Hospital  
Arrowe Park Road  
Upton  
United Kingdom  
CH49 5PE

**Study participating centre**

**Countess Of Chester Hospital NHS Foundation Trust**

The Countess Of Chester Health Park  
Chester  
United Kingdom  
CH2 1UL

**Study participating centre**

**Sheffield Children's NHS Foundation Trust**

Western Bank  
Sheffield  
United Kingdom  
S10 2TH

**Study participating centre**

**Leeds Teaching Hospitals NHS Trust**

St. James's University Hospital  
Beckett Street  
Leeds  
United Kingdom  
LS9 7TF

**Study participating centre**

**Sherwood Forest Hospitals NHS Foundation Trust**

Mansfield Road  
Sutton-in-Ashfield  
United Kingdom  
NG17 4JL

**Study participating centre**

**Nottingham University Hospitals NHS Trust**

Trust Headquarters  
Queens Medical Centre  
Derby Road  
Nottingham  
United Kingdom  
NG7 2UH

**Study participating centre**

**University Hospitals Of North Midlands NHS Trust**

Newcastle Road  
Stoke-on-Trent  
United Kingdom  
ST4 6QG

**Study participating centre**

**The Royal Wolverhampton NHS Trust**

New Cross Hospital  
Wolverhampton Road  
Heath Town  
Wolverhampton  
United Kingdom  
WV10 0QP

**Study participating centre**

**St George's University Hospitals Nhs Foundation Trust**

St George's Hospital  
Blackshaw Road  
Tooting  
London  
United Kingdom  
SW17 0QT

**Study participating centre**

**King's College Hospital NHS Foundation Trust**

Denmark Hill  
London  
United Kingdom  
SE5 9RS

**Study participating centre**

**Guy's and St Thomas' NHS Foundation Trust**

Trust Offices  
Guy's Hospital  
Great Maze Pond  
London  
United Kingdom  
SE1 9RT

**Study participating centre**

**Solent NHS Trust**

Solent NHS Trust Headquarters  
Highpoint Venue  
Bursledon Road  
Southampton  
United Kingdom  
SO19 8BR

**Study participating centre**

**Taunton and Somerset NHS Foundation Trust**

Musgrove Park Hospital  
Taunton  
United Kingdom  
TA1 5DA

**Study participating centre**

**Birmingham Women's NHS Foundation Trust**

Birmingham Womens Hospital  
Metchley Park Road  
Birmingham  
United Kingdom  
B15 2TG

**Study participating centre**

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

Trust Headquarters  
Marlborough Street  
Bristol  
United Kingdom  
BS1 3NU

**Study participating centre**

**University Hospitals of Derby and Burton NHS Foundation Trust**

Royal Derby Hospital

Uttoxeter Road

Derby

United Kingdom

DE22 3NE

**Study participating centre**

**Oxford University Hospitals NHS Foundation Trust**

John Radcliffe Hospital

Headley Way

Headington

Oxford

United Kingdom

OX3 9DU

**Study participating centre**

**Bradford Teaching Hospitals NHS Foundation Trust**

Bradford Royal Infirmary

Duckworth Lane

Bradford

United Kingdom

BD9 6RJ

**Study participating centre**

**Bedfordshire Hospitals NHS Foundation Trust**

Lewsey Road

Luton

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LU4 0DZ

**Study participating centre**

**Royal Free London NHS Foundation Trust**

Royal Free Hospital

Pond Street

London

United Kingdom

NW3 2QG

**Study participating centre****Royal Devon and Exeter NHS Foundation Trust**

Royal Devon & Exeter Hospital  
Barrack Road  
Exeter  
United Kingdom  
EX2 5DW

**Study participating centre****University Hospitals of Leicester NHS Trust**

Leicester Royal Infirmary  
Infirmary Square  
Leicester  
United Kingdom  
LE1 5WW

**Study participating centre****Northern Care Alliance NHS Foundation Trust**

Salford Royal  
Stott Lane  
Salford  
United Kingdom  
M6 8HD

## **Sponsor information**

**Organisation**

University of Liverpool

**Sponsor details**

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L69 3GL  
+44 (0)151 794 8739  
sponsor@liv.ac.uk

**Sponsor type**

University/education

**Website**

<http://www.liv.ac.uk/>

**ROR**

<https://ror.org/04xs57h96>

**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

**Funder Name**

National Health and Medical Research Council

**Alternative Name(s)**

NHMRC

**Funding Body Type**

Government organisation

**Funding Body Subtype**

National government

**Location**

Australia



# Results and Publications

## Publication and dissemination plan

- 1. The protocol will be published on the funder (NIHR) website
- 2. Peer-reviewed scientific journals
- 3. Conference presentation
- 4. Publication on website
- 5. Submission to regulatory authorities

## Intention to publish date

31/12/2024

## Individual participant data (IPD) sharing plan

The data-sharing plans for the current study are unknown and will 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="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Basic results</a>			20/01/2025	No	No