

# Does selective early treatment of patent ductus arteriosus in extreme preterm infants reduce the complications and improve their long-term outcome?

Submission date	Recruitment status	<input checked="" type="checkbox"/> Prospectively registered
13/08/2010	No longer recruiting	<input checked="" type="checkbox"/> Protocol
Registration date	Overall study status	<input checked="" type="checkbox"/> Statistical analysis plan
15/09/2010	Completed	<input checked="" type="checkbox"/> Results
Last Edited	Condition category	<input type="checkbox"/> Individual participant data
22/01/2026	Neonatal Diseases	

## Plain English summary of protocol

<https://www.npeu.ox.ac.uk/baby-oscar>

## Contact information

### Type(s)

Scientific

### Contact name

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## Additional identifiers

### Clinical Trials Information System (CTIS)

2013-005336-23

### ClinicalTrials.gov (NCT)

Nil known

**Protocol serial number**

Nil known

## Study information

### Scientific Title

Outcome after Selective early Closure of patent ductus ARteriosus (PDA) in extreme preterm infants: a randomised controlled trial

### Acronym

Baby-OSCAR

### Study objectives

Current hypothesis as of 03/08/2023:

To determine if the selective treatment of echocardiographically confirmed large PDAs in extremely preterm babies with ibuprofen within 72 hours of birth reduces the incidence of death or bronchopulmonary dysplasia (BPD) at 36 weeks postmenstrual age.

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Previous hypothesis as of 10/04/2014:

To determine if the selective treatment of confirmed large PDAs in extremely preterm babies with ibuprofen within 72 hours of birth reduces the incidence of death or bronchopulmonary dysplasia (BPD) at 36 weeks postmenstrual age.

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Previous hypothesis:

Early echocardiographic screening and targeted treatment of a PDA that fails to constrict spontaneously (LARGE PDA) will result in reduced incidence of death/chronic lung disease at 36 weeks and eventually less death/neurodevelopmental disability at 2 years corrected age.

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### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved 23/05/2014, Health Research Authority NRES Committee East Midlands - Nottingham 2 (Royal Standard Place Nottingham NG1 6FS, Nottingham, NG1 6FS, United Kingdom; +44 (0) 115 8839425; NRESCommittee.EastMidlands-Nottingham2@nhs.net), ref: 14/EM/0172

### Study design

Multicentre randomized placebo-controlled trial

### Primary study design

Interventional

### Study type(s)

Treatment

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

Patent Ductus Arteriosus (PDA)

## **Interventions**

Current interventions as of 10/04/2014:

This trial is intending to treat infants in the same window as the prophylaxis trials using ibuprofen with recommended doses as per study protocol. Patients will be randomised (1:1 ratio) to receive study medications or placebo, intravenously. Study medication will be provided as a clear sterile preservative-free solution for intravenous injection. An initial dose of 10 mg/kg will be followed by two doses of 5 mg/kg at 24 and 48 hours apart. The solution of ibuprofen is provided at a concentration of 10 mg/ml in a 5 ml single-use vial, thus 1 ml/kg, followed by two administrations of 0.5 ml/kg, will be required.

Previous interventions:

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## **Intervention Type**

Drug

## **Phase**

Not Applicable

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

Ibuprofen

## **Primary outcome(s)**

Current primary outcome measures as of 03/08/2023:

The primary outcome is defined as a composite outcome of death by 36 weeks postmenstrual age or moderate or severe BPD at 36 weeks post-menstrual age.

Severity-Based Diagnostic Criteria for BPD is defined as:

Therapy with oxygen >21% and/or respiratory support for  $\geq 28$  days and the following:

Mild BPD: Baby is breathing room air

Moderate BPD: Baby is in 22–29% oxygen, or 0.01–1.0 L/min

Severe BPD:  $\text{FiO}_2 \geq 0.3$ , or low flow oxygen  $\geq 1.1 \text{ L/min}$ , or the baby is receiving any respiratory support (ventilation, CPAP, or high flow oxygen therapy) to achieve saturations of  $\geq 91\%$

The need for oxygen is subjective and hence oxygen dependency is confirmed using an 'oxygen reduction test'. This is based on the threshold at which the baby is able to maintain oxygen saturations  $\geq 91\%$  whilst breathing in air or at a given minimum  $\text{FiO}_2$ . Babies unable to achieve this are considered to be oxygen-dependent. This test only applies to those babies whose oxygen requirements are  $<0.3$ , or low flow oxygen  $<1.1 \text{ L/min}$ , and who have not received any additional respiratory support in the previous 24h. Babies outside of this are not tested, but data on their oxygen requirements will be collected.

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Previous primary outcome measures as of 10/04/2014:

The primary outcome is defined as a composite outcome of death or BPD at 36 weeks post-menstrual age. BPD is defined as the need for respiratory support and/or oxygen for 28 days or

more and at 36 weeks post-menstrual age. The need for oxygen is subjective and hence oxygen dependency will be confirmed using an oxygen reduction test. This is based on whether the baby is able to maintain oxygen saturations over 90% for 1 hour whilst breathing air. Babies unable to achieve this will be considered to be oxygen dependant.

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Previous primary outcome measures:

Death or severe neuro-developmental disability at 2 years corrected age.  
The Bayley's scale of infant development III will be used to assess outcomes.

### **Key secondary outcome(s)**

Current secondary outcome measures as of 03/08/2023:

Short-term outcomes:

1. Death by 36 weeks postmenstrual age
2. Moderate or severe BPD at 36 weeks postmenstrual age
3. Severity of BPD at 36 weeks postmenstrual age
4. Incidence or duration of the following up to discharge:
  - 4.1. Severe intraventricular haemorrhage (IVH) (grade III/IV with ventricular dilatation or intraparenchymal abnormality)
  - 4.2. Cystic periventricular leukomalacia (PVL)
  - 4.3. Non-cystic PVL
  - 4.4. Hydrocephalus
  - 4.5. Babies treated for retinopathy of prematurity (ROP)
  - 4.6. Significant pulmonary haemorrhage (fresh blood in endotracheal tube with increase in respiratory support)
  - 4.7. Treated for pulmonary hypertension with pulmonary vasodilator
  - 4.8. NEC definitive and/or complicated (Bell stage II and above) confirmed by radiology and/or histopathology
  - 4.9. NEC requiring surgery
  - 4.10. Gastrointestinal bleeding (leading to investigation or clinical treatment) within 7 days of the first dose of trial drug administration
  - 4.11. Spontaneous intestinal perforation
  - 4.12. Closed or non-significant PDA (<1.5mm) at around 3 weeks of age (range of 18–24 days), confirmed by ECHO
  - 4.13. PDA  $\geq 1.5\text{mm}$  at around 3 weeks of age (range of 18–24 days)
  - 4.14. Medical open-label treatment of a symptomatic PDA with a COX inhibitor
  - 4.15. Open-label treatment of a symptomatic PDA by surgical treatment
  - 4.16. Administration and duration of inotropic support
  - 4.17. Total duration of respiratory support:
    - 4.17.1. Invasive ventilation through an endotracheal tube
    - 4.17.2. Non-invasive support through nasal CPAP, nasal ventilation, humidified high-flow nasal cannula therapy, or low-flow oxygen  $\geq 1.1\text{L/min}$
  - 4.18. Discharge home on oxygen
  - 4.19. Duration of initial hospitalisation (birth to discharge home)
  - 4.20. Postnatal steroid use for chronic lung disease
  - 4.21. Tolerance of ibuprofen treatment within the foreseeable SAE reporting range
  - 4.22. Weight gain: a change in z score between birth and discharge (or death if sooner)
  - 4.23. Head circumference: a change in head size z score between randomisation and discharge (or death if sooner)

Long-term outcomes assessed at 2 years of age corrected for prematurity:

5. Survival without moderate or severe neurodevelopmental disability (main long-term outcome)
6. Survival
7. Individual components of survival without moderate or severe neurodevelopmental disability (in the four domains of motor, cognitive, hearing and visual function). Cognitive disability will be assessed by determining the standardised non-verbal cognitive subscale and language subscale scores obtained through the Parent Report of Cognitive Abilities-Revised (PARCA-R) assessment. The PARCA-R assessment will be adapted to include questions to assess gross motor, hearing and visual function.
8. Survival without respiratory morbidity. Respiratory morbidity will be assessed by the need for oxygen or respiratory support; presence of persistent cough and/or wheeze; need for regular treatment for respiratory illness; unscheduled attendances at hospital/GP; readmission to hospital for respiratory problems
9. Duration of oxygen supplementation from randomisation
10. A cost-effectiveness analysis will be conducted of deaths and BPD events avoided and national health services used up to 2 years of age corrected for prematurity

Process outcomes:

11. Number of doses of trial medication received
12. Adherence to protocol (e.g. protocol violations, incidence of non-symptomatic open-label treatment etc)
13. Study withdrawals

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Previous secondary outcome measures as of 10/04/2014:

Secondary outcomes are divided into short- and long-term outcomes:

1. Short-term outcomes:

- 1.1. Death before discharge
2. Incidence or duration of the following up to time of neonatal unit discharge:
  - 2.1. Severity of BPD at 36 weeks postmenstrual age
  - 2.2. Severe IVH (grade 3/4 with ventricular dilation or intraparenchymal bleeding)
  - 2.3. Cystic periventricular leukomalacia (PVL)
  - 2.4. Retinopathy of prematurity (ROP) requiring treatment
  - 2.5. Pulmonary haemorrhage
  - 2.6. Pulmonary hypertension
  - 2.7. NEC definitive and/or complicated (Bell stage II and above) confirmed by radiology or histopathology
  - 2.8. NEC requiring surgery
  - 2.9. Gastrointestinal bleeding within 7 days of the first dose of study drug administration
  - 2.10. Spontaneous intestinal perforation
  - 2.11. PDA closure at 3 weeks of age (or hospital discharge, if discharged before this age)
  - 2.12. Medical rescue treatment with a COX inhibitor of a symptomatic PDA
  - 2.13. Administration and duration of inotropic support
  - 2.14. Duration of mechanical ventilation
  - 2.15. Total duration of respiratory support (ventilation + nCPAP/high flow oxygen therapy)
  - 2.16. Discharge home on oxygen
  - 2.17. Duration of initial hospitalisation (birth to neonatal unit discharge home)
  - 2.18. Postnatal steroid use
  - 2.19. Safety and tolerability of ibuprofen treatment
  - 2.20. Number of doses of trial medication received during intervention period
  3. Secondary long-term clinical outcomes assessed at 2 years of age corrected for prematurity

- 3.1. Survival without moderate or severe neurodevelopmental disability
- 3.2. Individual components of survival without moderate or severe neurodevelopmental disability (in the four domains of motor, cognitive, hearing and visual function)
- 3.3. Survival without respiratory morbidity
- 3.4. A cost-effectiveness analysis will be conducted of deaths and BPD events avoided and national health services used up to 2 years of age corrected for prematurity

Previous secondary outcome measures:

1. Mortality
2. Complications of prematurity
3. Cardiovascular effects
4. Respiratory outcomes
5. Acute abdominal problems
6. Side effects of medicine
7. Length of hospital stay
8. Developmental outcome at 2 years

#### **Completion date**

31/08/2023

## **Eligibility**

### **Key inclusion criteria**

Current inclusion criteria as of 03/08/2023:

1. Born at 23+0 to 28+6 weeks of gestation
2. Less than 72 hours old
3. Confirmed by echocardiography to have a large PDA which is at least 1.5 mm in diameter (determined by gain optimised colour Doppler) AND has unrestrictive pulsatile (left to right) flow (ratio of flow velocity in PDA Maximum (Vmax) to Minimum (Vmin)  $> 2:1$ ) or, growing flow pattern ( $< 30\%$  right to left), and no clinical concerns of pulmonary hypertension
4. The responsible clinician is uncertain about whether this baby might benefit from treatment to close the PDA
5. Written informed consent has been obtained from the parent(s)

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Previous inclusion criteria as of 10/04/2014:

1. Born at 23+0 to 28+6 weeks of gestation
2. Less than 72 hours old
3. Confirmed by echocardiography to have a large PDA which is at least 1.5 mm in diameter (determined by gain optimised colour Doppler) AND has unrestrictive pulsatile left to right flow
4. The responsible clinician is uncertain about whether this baby might benefit from treatment to close the PDA
5. Written informed consent has been obtained from the parent(s)

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Previous inclusion criteria:

1. Preterm infants born between 23+0 and 28+6 weeks gestation
2. Echocardiographic assessment within 24 hours of birth meeting the enrolment criteria
3. Signed parental consent

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Neonate

**Lower age limit**

0 days

**Upper age limit**

3 days

**Sex**

All

**Total final enrolment**

653

**Key exclusion criteria**

Current exclusion criteria as of 03/08/2023:

1. No realistic prospect of survival
2. Severe congenital anomaly
3. Clinical or echocardiography suspicion of congenital structural heart disease that contraindicates treatment with ibuprofen
4. Other conditions that would contraindicate the use of ibuprofen (active bleeding especially intracranial or gastrointestinal bleeding, coagulopathy, thrombocytopenia (platelet count <50,000), renal failure, life threatening infection, pulmonary hypertension, known or suspected necrotising enterocolitis (NEC))
5. Indomethacin, ibuprofen, or paracetamol administration after birth

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Previous exclusion criteria as of 10/04/2014:

1. No realistic prospect of survival
2. Severe congenital anomaly
3. Structural heart disease requiring treatment
4. Other conditions that would contraindicate the use of ibuprofen (clinically significant intracranial or gastrointestinal haemorrhage, coagulopathy, thrombocytopenia [platelet count <50,000], renal failure, pulmonary hypertension, known or suspected necrotising enterocolitis [NEC])
5. Antenatal exposure to cyclo-oxygenase (COX) inhibitors
6. Received indomethacin, ibuprofen or paracetamol administration after birth

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Previous exclusion criteria:

1. Baby clinically unstable and not expected to survive
2. Congenital anomalies predicted to influence neurodevelopmental outcome
3. Structural heart disease

4. Contraindication to use of ibuprofen (platelet count <50,000)
5. Unlikely to commence first dose of treatment by 24 hours of age

**Date of first enrolment**

01/07/2014

**Date of final enrolment**

31/12/2020

## Locations

**Countries of recruitment**

United Kingdom

England

**Study participating centre**

Professor of Neonatology

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Stockton-on-Tees

England

TS19 8PE

## Sponsor information

**Organisation**

University of Oxford (UK)

**ROR**

<https://ror.org/052gg0110>

## Funder(s)

**Funder type**

Government

**Funder Name**

NIHR Health Technology Assessment Programme - HTA (UK)

## Results and Publications

## Individual participant data (IPD) sharing plan

The NPEU is committed to sharing data with the research community. Data will be shared in accordance with the National Perinatal Epidemiology Unit Data Sharing policy. Requests for access to the data will be considered by the National Perinatal Epidemiology Unit Data Sharing Committee. Access to anonymized data can be requested from [ctu@npeu.ox.ac.uk](mailto:ctu@npeu.ox.ac.uk).

### IPD sharing plan summary

Available on request

#### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	Short-term outcomes	25/01/2024	25/01/2024	Yes	No
<a href="#">Results article</a>	Two-years outcomes	20/08/2025	04/09/2025	Yes	No
<a href="#">Protocol article</a>	protocol	26/02/2021	01/03/2021	Yes	No
<a href="#">Other files</a>	2 year form version 2.0	10/07/2018	15/07/2024	No	No
<a href="#">Participant information sheet</a>	version 7.0	10/07/2018	03/08/2023	No	Yes
<a href="#">Preprint results</a>	Health economic outcomes	24/06/2025	13/01/2026	No	No
<a href="#">Statistical Analysis Plan</a>	statistical analysis plan	26/05/2021	28/05/2021	No	No
<a href="#">Statistical Analysis Plan</a>	version 1.0	20/04/2023	20/06/2023	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes