

NEONATAL STROKE

Abstract	<p>Neonatal stroke is a devastating condition that causes brain injury in babies and often leads to lifelong impairment. Presently, we have insufficient information about the number of babies with neonatal stroke. We know little about which babies are most at risk and what problems they will likely face. There is no agreed guidance on how we should investigate and treat babies with stroke. This is unlike stroke in older children and adults where much more is known.</p> <p>We will be asking all UK and Irish paediatricians and neonatologists to report any babies with neonatal stroke in the first 3 months of life to the BPSU. Reporting clinicians will then be directed to the online questionnaires via the dedicated BPSU online platform.</p> <p>This study will inform us of the burden of neonatal stroke to better allocate resources. By exploring how babies with stroke present and are cared for, future studies looking at prevention and new treatment options can be better designed.</p>
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Website	<p>www.rcpch.ac.uk/work-we-do/bpsu/neonatal-stroke</p>
Background	<p>In babies, the brain is still immature. Hence, neonatal stroke is different from a stroke in older children and has significant lifelong impacts¹.</p> <p>Currently, we do not have enough information about the incidence of neonatal stroke. Most doctors will see only a few cases in their career. There may be a delay in recognising the subtle initial signs of neonatal stroke. There is also no agreed guidance on how neonatal stroke should be investigated and managed.</p> <p>This study will address these questions. This will enhance our understanding of neonatal stroke and its impact, besides improving the care we provide to babies with stroke.</p>
Coverage	<p>United Kingdom and Republic of Ireland</p>
Duration	<p>April 2022 to May 2023 (13 months of surveillance) with a two-year follow-up.</p>
Research Questions	<ol style="list-style-type: none">1. What is the incidence of neonatal stroke of newborn infants in the UK and the Republic of Ireland?2. What is the two-year outcome of neonatal stroke, including neurodevelopmental outcome?

3. What is the proportion of the different types of neonatal stroke (arterial ischaemia, venous thrombosis or haemorrhage) and its impact on presentation as well as outcome?
4. What is the known predisposing maternal and infant factors for neonatal stroke?
5. How does infants with neonatal stroke present?
6. How does the clinical investigations used in neonatal stroke vary across the UK and the Republic of Ireland?
7. What are the imaging findings of neonatal stroke?
8. How does the management of neonatal stroke including the follow-up pathway vary across the UK and the Republic of Ireland?

Case definition

Neonatal stroke, of either arterial ischaemic, venous thrombosis or haemorrhagic in origin, suspected in any child from birth till 90 days of age, of any gestation. They must have:-

1. Any neurological symptoms (e.g. seizure, neurological deficit, lethargy, abnormal tone, poor feeding)

AND either

- 2a Neuroimaging (such as MRI or CT) showing disruption or evidence of disruption of cerebral blood flow
- 2b Neuropathologic studies showing disruption or evidence of disruption of cerebral blood flow

Please **exclude** cases of **germinal matrix haemorrhage/intraventricular haemorrhage or periventricular leukomalacia in preterm infants** (defined as below 37 weeks of gestational age) or **hypoxic ischaemic encephalopathy**.

Reporting instructions

Please report any child below 90 days of age, of any gestation, that meets the above case definitions of neonatal stroke which you have seen in the last month. Please report all suspected cases, even if the results of the investigations are pending.

Methods

Each paediatrician reporting a child who meets the above case definition of neonatal stroke will be sent an online clinical questionnaire by the study team at **notification** and at **2 years of age**.

Throughout the study, all patient data will be dealt with in strict confidence, and the families of affected infants will not be contacted directly by the study team at any stage.

Ethics approval

This study has been approved by the East Midlands – Nottingham 1 Research Ethics Committee (reference: 21/EM/0110); HRA Confidentiality Advisory Group (reference: 21/CAG/0061); the Public Benefit and Privacy Panel for Health and Social Care (reference: 2122-0006 Kwok); and the Privacy Advisory Committee in Northern Ireland.

Support group

Bliss (<https://www.bliss.org.uk>)

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References

1. Raju TN, Nelson KB, Ferriero D, et al. Ischemic perinatal stroke: summary of a workshop sponsored by the National Institute of Child Health and Human Development and the National Institute of Neurological Disorders and Stroke. *Pediatrics* 2007;120(3):609-16. doi: 10.1542/peds.2007-0336