NICE National Institute for Health and Care Excellence

Intravenous-to-oral antibiotic switch for neonates: the experience of early adopters in the UK

Case studies

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Overview

Organisation: Royal Devon University Healthcare NHS Foundation Trust

Organisation type: NHS Foundation Trust

This case study describes how the Royal Devon University Healthcare NHS Foundation Trust implemented a policy to enable babies on intravenous antibiotics for suspected early-onset neonatal infection to be switched to oral antibiotics and discharged home. It also refers to 2 other similar projects. It provides the key outcomes and learning from all 3 projects.

Neonatal intravenous-to-oral antibiotic switch pathways offer enormous potential to reduce neonatal bed days and associated costs. However, the priority is to avoid unnecessary antibiotic treatment in the first place, and to stop antibiotics if the clinical picture allows.

The switch from intravenous to oral antibiotics is for babies who genuinely need a full course of antibiotics but for whom intravenous antibiotics can be replaced with oral antibiotics. It is not a reason to extend treatment that could safely be stopped.

Neonatal oral antibiotics at home project

Inspired by the findings of the RAIN study (Keij et al. 2022), the Royal Devon University Healthcare NHS Foundation Trust ran a 6-month project from June 2024 to facilitate neonatal teams at its Exeter site to switch from intravenous to oral antibiotics, where possible, for term babies with suspected early-onset infection who need treatment beyond 36 hours.

During the project, the change of practice was rigorously evaluated and refined. By the end of the 6 months, it was fully embedded into normal practice at the Exeter site and running smoothly. It was extended to the trust's Barnstaple site in February 2025.

Known as 'neonatal oral antibiotics at home' (NOAH), the project was completed before the May 2026 update of NICE's guideline on neonatal infection, which introduced new

recommendations on switching to oral antibiotics. The NOAH project contributed to the guidance through expert witness evidence, which the guideline committee considered.

Under the change of practice, babies are eligible for oral switch if they are born at term, clinically well at 36 hours, have a peak C-reactive protein level below 50 that is falling, and have no positive blood or cerebrospinal fluid culture. These criteria were chosen with caution and are more restrictive than those described in the literature (Keij et al., Carlsen et al., Gyllensvärd et al.). They are also different to the criteria in NICE's guideline on neonatal infection.

Parents and carers of babies meeting these criteria are offered the option for their baby to be discharged home with a course of oral antibiotics. They are also given the contact details of the neonatal unit to call if they have any concerns.

The choice of oral antibiotic is amoxicillin at a dosage of 30 mg/kg three times daily for a total antibiotic course duration of 7 days. NICE's guideline on neonatal infection recommends up to 7 days.

Parents and carers of babies at home on oral antibiotics, as with all babies discharged from neonatal care, get a telephone call from a neonatal nurse on the day after discharge. They also receive a phone call from the neonatal team before their baby has completed their oral antibiotics. This is in line with NICE's guideline on neonatal infection, which recommends at least 2 follow-up consultations for parents and carers of babies on oral antibiotics.

Implementation

Before the project could get underway, the team of neonatal consultants at Exeter discussed the evidence for implementing NOAH and agreed to take the idea forward. External expertise provided reassurance that the principle of switching to oral antibiotics was sensible.

Engagement with other colleagues, including paediatric infectious diseases and microbiology colleagues, as well as nurses, midwives, general paediatricians and pharmacists followed. This involved email exchanges, formal and informal conversations and presentations at meetings.

Feedback from parents through the trust's maternity and neonatal voices partnership also

played a part in the development of the project.

Another important early step involved creating a local guideline, circulating it for comments, and taking it to the appropriate governance meetings for ratification.

Finally, the change in practice was shared with all staff. This was done through formal teaching sessions, posters, emails and '5-minute teaching sessions' delivered at staff handovers.

Other similar projects

By sharing the findings of the NOAH project at regional and national conferences and teaching events, 2 other projects implementing similar neonatal intravenous-to-oral antibiotic switch pathways were identified at:

- St George's Hospital in London
- 6 hospitals across Kent, Surrey and Sussex.

Alignment with national policies

As well as aligning with NICE's guideline on neonatal infection, intravenous-to-oral switch is consistent with several national policy priorities, namely:

- UK Health Security Agency's framework for intravenous-to-oral antibiotic switch, which supports early transition to oral antibiotics in appropriate patients across all age groups
- NHS England's Getting It Right First Time neonatal recommendation to reduce mother-baby separation and improve the family experience of neonatal care
- NHS 10-year plan's ambition to shift care out of hospital and into home settings, enabling well babies to complete treatment in their own environment rather than occupying a neonatal bed.

Outcomes and learning

Outcomes

The key outcomes across the 3 projects are summarised below.

- **Safety:** no confirmed late sepsis, adverse events or deaths.
- **Shorter hospital stays:** eligible babies were able to complete antibiotic treatment at home, reducing unnecessary time in hospital.
- **Family experience:** parents valued getting home sooner and being together as a family.
- **Parent confidence:** families found oral antibiotics easy to give to their babies.
- **Staff experience:** staff reported that the NOAH pathway was practical to implement once guidance, training and reassurance were in place.
- **Reduced treatment burden:** fewer cannulation attempts because babies spent less time on intravenous antibiotics; they also had reduced exposure to gentamicin as a result of the switch to oral antibiotics.
- **System benefits:** reduced demand for neonatal beds, which reduced the demand for staff and lowered costs.
- **Environmental impact:** reduced hospital stays may have contributed to a smaller carbon footprint.

Learning

- **Choice of oral antibiotic:** One important evolution in the projects was in the choice of oral antibiotic. The NOAH project and the project across Kent, Surrey and Sussex both originally used oral co-amoxiclav, in line with the RAIN trial. Following multidisciplinary review with microbiology, infectious diseases and pharmacy colleagues, the NOAH project switched to oral amoxicillin. The key reasons for this change were the discovery of a dosing discrepancy with co-amoxiclav, the spectrum of likely pathogens in early-onset neonatal infection and antimicrobial stewardship principles

around avoiding unnecessarily broad-spectrum treatment. The project at St George's Hospital used amoxicillin from the beginning.

- **Clinicians have embraced the change:** The neonatal intravenous-to-oral antibiotic switch pathways have been rapidly adopted and well received at every implementing site. Even the most cautious clinicians have embraced the change.
- **Sharing the evidence and need for champions:** Delivering clinical training that included a review of the evidence underpinning the safety of oral switch helped inspire confidence in the change. Appointing champions to monitor implementation was key while the change became embedded in clinical practice, allowing for early detection and improvement of any issues identified.
- **Need for strong leadership:** Strong local leadership was critical at every site. Having a named project lead with the drive and authority to move things forward made a significant difference. Senior neonatal doctors were the key stakeholders and having a consultant body willing to embrace change supported smooth implementation.

Supporting information

A range of resources are available on the Health Innovation Network South West's NOAH webpage to support other neonatal teams looking to implement a neonatal intravenous-to-oral antibiotic switch pathway. Up to June 2026, more than 100 trusts across the UK have accessed these resources.

For a full evaluation of the NOAH project, including results and lessons learned, and the combined evaluation of all 3 projects, see:

- evaluation of the neonatal oral antibiotics at home pathway at RDUH (this covers the 6-month project at the Exeter site and is linked to from the section on partnership)
- evaluation of the early adopters of the neonatal oral switch pathway in the UK (linked to from the section on resources).

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Further research

Evidence gaps remain, particularly around the safety of oral switch at scale and eligibility criteria. Work is being done to address this through a coordinated national evaluation across implementing sites, facilitated by the neonatal operational delivery networks.

Units interested in joining the evaluation or finding out more about implementing the NOAH pathway can contact NOAH@healthinnovationsouthwest.com.

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