

Title:	NWNODN Clinical Pathways
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Introduction

Neonatal services within the North West are provided within three localities, Lancashire & South Cumbria, Cheshire & Merseyside and Greater Manchester which together form the North West Neonatal Operational Delivery Network (NWNODN). Since 2014 neonatal networks have played an essential role in coordinating neonatal care across regions. Each network consists of NICU, LNU, SCU and specialist Surgical services, and a specialist neonatal transport service. They all work in a coordinated fashion to provide equitable access to intensive care services and deliver high-quality care for all patients as close to home as possible.

The ODNs have a mandate to develop and implement programmes of work to improve access to specialist resources, neonatal outcomes and patient experience, working closely with both providers and commissioners and service users.

The development of neonatal clinical pathways in the NWNODN have evolved in response to national standards and local system organisation. The aim of the pathways are to ensure collaborative clinical decision making for babies and families by defining clear clinical pathways aligned to service designations and specifications.

Purpose

The purpose of this guideline is to bring together all national and local pathways and standards that drive flows around the NWNODN. This document does not seek to replace individual diagnosis or flow specific guidelines but rather to form a backdrop to the pathways within the NWNODN and ensure the four key success factors behind the ODN are met:

- Improved access to and egress to/from services at the right time
- Improved operating consistency
- Improved outcomes
- Increased productivity

General principles

- Each unit should work to the agreed [Service Specification](#) for its designation.
- All units should follow agreed pathways and escalate where this has not been possible
- Where a baby's clinical condition falls outside the unit's service specification then units will follow the [NWNODN Advice Guideline](#) and facilitate timely transfer to the locality NICU able to provide care at the threshold expected.
- Activity which occurs outside of the unit's Service specification will be exception reported as outlined in the [NWNODN Exception Guideline](#)
- Neonatal Intensive Care Units (NICUs) within the network must ensure timely repatriation of babies to Local Neonatal Units (LNUs) and Special Care Baby Units (SCUs), the LNUs/SCUs should work with NICUs to facilitate this, when the baby meets the criteria for LNU care and is stable for transfer to ensure care as close to home as possible for families and to maintain capacity within NICU services across the region.

- The Referring Unit will follow the [Repatriation guideline](#) and must ensure appropriate and accurate record keeping of any local decisions or discussions with the receiving unit that delay repatriation and potentially impact NICU capacity.

Clinical Pathways

Clinical pathways across the NWNODN support both care in the right place and care closer to home. Availability of NICU cots for the NW relies upon appropriate management of pathways by all providers. Implementation of Family Integrated care requires families having access to their baby and therefore focus must be on keeping babies closest to home where possible. All NICUs, LNUs and SCUs in the NW must understand their responsibilities around swift referral, clear communication and family support within management of clinical pathways.

All NWNODN clinical pathways require the support of the Specialist Neonatal Transport Service Connect North West (CNW). CNW provide all neonatal transport activity in the NW and link to local paediatric transfer team where necessary. Availability of transport is necessary to maintain patient flows and support appropriate management of clinical pathways both in acute situations where uplift of care is required and for repatriations where babies fit to return closer to home.

Unit Designation

National service specification sets out appropriate activity to be undertaken in each level of neonatal unit. A unit's designation impacts on the required staffing levels and the care that unit can offer to the local population.

Definitions (as set out in NHS England Service Specification for Neonatal Critical Care)

<http://www.england.nhs.uk/resources/spec-comm-resources/npc-crg/group-e/e08/>

and the

[Service Standards for Hospitals Providing Neonatal Care \(3rd edition\) \(2010\) | British Association of Perinatal Medicine \(bapm.org\)](#)

Neonatal Intensive Care Units (NICU) provide care for the whole range of neonatal care. They are staffed to care for the sickest and most immature babies and staff work closely with their local maternity teams and fetal medicine services. The NHS England Neonatal Critical Care service specification [E08/S/a] indicates that all women and their babies who are born <27 weeks of gestation or birthweight <800g, and multiple pregnancies <28 weeks of gestation, should receive perinatal and early neonatal care in a maternity service with a NICU facility.

Local Neonatal Units (LNU) provide care for all babies born at their hospital at 27 weeks of gestation or more, >800g birthweight or multiple pregnancies >28 weeks (which includes short-term intensive care where necessary) and they may receive babies 27-31 weeks who require high dependency care.

Special Care Units (SCU) provide local care for babies born at 32 weeks or more and >1000g birthweight who require only special care or short-term high dependency care. All pregnant women who fall outside these categories or babies who unexpectedly need intensive care are transferred to an appropriate unit in the local care pathway.

Cheshire & Merseyside Neonatal Care Service Provision

Neonatal Unit	Care provided	Patient flows <u>OUT</u>
Liverpool Women's NHS Foundation Trust	All gestations Long Term Ventilation Oscillation Nitric Oxide CPAP Active Cooling Total Parenteral Nutrition High Flow	ECMO Surgery
Wirral University Teaching Hospital NHS Foundation Trust Arrowe Park Hospital	All gestations Long Term Ventilation Nitric Oxide CPAP Total Parenteral Nutrition Active Cooling High Flow	ECMO Surgery
Countess of Chester Hospital (For a limited time only, the following care will be provided)	<p><u>Usual care</u> Babies 27 weeks and over Short Term Ventilation CPAP Total Parenteral Nutrition High Flow</p> <p>Please note due to an ongoing Police investigation the unit has been temporarily re-designated to a SCU in line with recommendations from NHSE. Therefore, there is a current restriction of:</p> <ul style="list-style-type: none"> • Babies 32 weeks and over • Stabilisation and transfer of babies requiring intensive care 	ECMO Oscillation Nitric Oxide Active cooling beyond initiation Any complex case requiring tertiary centre care Surgery
Warrington Hospital	Babies 27 weeks and over Short Term Ventilation CPAP Total Parenteral Nutrition High Flow Twins > 28 weeks	ECMO Oscillation Nitric Oxide Active cooling beyond initiation Any complex case requiring tertiary centre care Requiring Surgical intervention

Leighton Hospital	Babies 27 weeks and over Short Term Ventilation CPAP Total Parenteral Nutrition High Flow Twins > 28 weeks	ECMO Oscillation Nitric Oxide Active Cooling Any complex case requiring tertiary centre care Requiring Surgical intervention
Macclesfield Hospital	Babies 32 weeks and over Special care only. No CPAP/HFNC No TPN	ECMO Oscillation Nitric Oxide Active Cooling Any complex case requiring tertiary centre care Surgery
Whiston Hospital	Babies 27 weeks and over Short Term Ventilation Total Parenteral Nutrition High Flow CPAP Twins > 28 weeks	ECMO Oscillation Nitric Oxide Active Cooling Any complex case requiring tertiary centre care Requiring Surgical intervention All babies who require Intensive care or ventilation Any baby < 1000g
Ormskirk Hospital	Babies 27 weeks and over Short Term Ventilation Total Parenteral Nutrition High flow CPAP Twins > 28 weeks	ECMO Oscillation Nitric Oxide Active Cooling Any complex case requiring tertiary centre care Requiring Surgical intervention
Alder Hey Neonatal Surgical Unit	High dependency care Post-surgical management	Intensive care

Lancashire and South Cumbria Care Service Provision

Neonatal Unit	Care Provided	Patient Flows OUT
Barrow in Furness	Special care only. High dependency back to Lancaster No CPAP/HFNC No TPN	All babies less than 32+0 weeks gestation All babies who require: Intensive care or ventilation CPAP/HFNC Active cooling High dependency care except NAS Any baby < 1000g High dependency care to Lancaster Surgical & cardiac according to current transfer policy
Blackpool	Babies 27 weeks and over Twins > 28 weeks Short Term Ventilation CPAP Total Parenteral Nutrition High Flow Special Care	Less than 27+0weeks Ongoing care beyond initial stabilization and intensive care for babies < 800g Complex intensive care Support for more than one organ e.g. ventilation and inotropes Nitric Oxide High frequency oscillatory ventilation (HFOV) Active Cooling Prolonged intensive care (ventilatory support) greater than 48 hrs
Lancaster	Babies 27 weeks and over Twins > 28 weeks Short Term Ventilation CPAP/HFNC (infants below 1000g to be discussed on case by case basis) Total Parenteral Nutrition High Dependency Special care	Less than 27+0 weeks – transfer to Preston or Burnley unless requiring specialist tertiary services Ongoing care beyond initial stabilization and intensive care to babies < 800g complex intensive care support for more than one organ e.g. ventilation and inotropes Nitric Oxide High frequency oscillatory ventilation (HFOV) Active Cooling Prolonged intensive care (ventilatory support) greater than 48 hours Surgical & cardiac according to current transfer policy
Burnley	All care levels including intensive care Post-surgery, post cardiac	ECMO Surgery Complex Cardiac
Preston	All care levels including intensive care Post-surgery, post cardiac	ECMO Surgery Complex Cardiac

Greater Manchester Care Service Provision

Neonatal Unit & Designation	Care provided	Patient Flows OUT
<p align="center">Royal Bolton Hospital</p> <p align="center">NICU</p>	<p>All gestations Long Term Ventilation Complex Intensive Care High Frequency Oscillation Ventilation Inhaled Nitric Oxide Therapeutic Hypothermia Total Parenteral Nutrition CPAP High Flow O₂</p>	<p>ECMO Surgery Complex Cardiac</p>
<p align="center">St Mary's Hospital</p> <p align="center">NICU</p>	<p>All gestations Long Term Ventilation Complex Intensive Care High Frequency Oscillation Ventilation Inhaled Nitric Oxide Therapeutic Hypothermia Total Parenteral Nutrition CPAP High Flow O₂ Surgery</p>	<p>ECMO Complex Cardiac</p>
<p align="center">Royal Oldham Hospital</p> <p align="center">NICU</p>	<p>All gestations Long Term Ventilation Complex Intensive Care High Frequency Oscillation Ventilation Inhaled Nitric Oxide Therapeutic Hypothermia Total Parenteral Nutrition CPAP High Flow O₂</p>	<p>ECMO Surgery Complex Cardiac</p>
<p align="center">North Manchester General Hospital</p> <p align="center">LNU</p>	<p>Babies 29 weeks gestation and above Short Term Ventilation < 48 hours Total Parenteral Nutrition CPAP</p>	<p>ECMO Surgery Cardiac Ongoing/complex intensive care</p>

	High Flow O ₂ Twins >28 weeks	Active Cooling
Stepping Hill Hospital LNU	Babies 27 weeks gestation and above Short Term Ventilation < 48 hours Total Parenteral Nutrition CPAP High Flow O ₂ Twins >28 weeks	ECMO Surgery Cardiac Ongoing/complex intensive care Active Cooling
Wythenshawe Hospital LNU	Babies 27 weeks gestation and above Short Term Ventilation < 48 hours Initiation of Therapeutic Hypothermia Total Parenteral Nutrition CPAP High Flow O ₂ Twins >28 weeks	ECMO Surgery Cardiac Ongoing/complex intensive care Active cooling beyond initiation
Tameside General Hospital LNU	Babies 27 weeks gestation and above Short Term Ventilation < 48 hours Total Parenteral Nutrition CPAP High Flow O ₂ Twins >28 weeks	ECMO Surgery Cardiac Ongoing/complex intensive care Therapeutic Hypothermia
Wigan Royal Albert Infirmary LNU	Babies 27 weeks gestation and above Short Term Ventilation < 48 hours Initiation of Therapeutic Hypothermia Total Parenteral Nutrition CPAP High Flow O ₂ Twins >28 weeks	ECMO Surgery Cardiac Ongoing/complex intensive care Active cooling beyond initiation

Admission Criteria Pathways

Locality

Each neonatal unit will have a defined catchment geographical area which will often correspond to the hospital of maternal booking. This will normally be linked to a default NICU covering a wider geographical area, which would be considered as the primary choice for uplift postnatal transfers or In Utero transfers to ensure proximity to the postcode for the family home. Where the default NICU or Maternity unit cannot accept an external admission, the next nearest unit will be approached.

Diagnosis and Management of Preterm Labour (From 22+0 weeks gestation)

This regional guideline is intended for use in all maternity units across the North West Coast ([link to NWC guideline](#)) and Greater Manchester and East Cheshire Strategic Clinical Networks ([link to GM+EC guideline](#)) and covers the diagnosis and management of preterm labour and birth (GM and NWC have individual maternity guidelines both of which contain the same Neonatal content). The guidelines include the pathway for transfer to a maternity unit with tertiary level neonatal services available (NICU) when a decision for active management has been made.

This guideline aligns with the [BAPM Perinatal Management of Extreme Preterm Birth Framework for Practice](#) (©BAPM 2019)

In Utero Transfer

This guideline was developed to provide the best available evidence-based practice for the acute transfer of mothers and their babies in-utero. It aims to provide a clear process for in-utero transfers between hospitals and maternity units within regional networks and the wider NWNODN.

Excluded from this guidelines remit are elective transfers for ongoing management following detection of fetal anomalies or where a baby is not anticipated to require admission to the neonatal unit.

Link to Guideline: [In Utero Transfer](#)

Infants less than 27 week

The survival of babies born before 27 weeks is improved when this occurs in a maternity service with a NICU.

The National Neonatal Audit Programme (NNAP) and NHSE have set a national target that at least 85% of deliveries for babies born below 27 weeks gestation (<28 weeks if multiple pregnancy) should be delivered in a maternity unit where there is also tertiary level Neonatal Intensive Care services available.

All infants born before 27 weeks (<28 weeks if multiple pregnancy) outside a NICU will be exception reported as per the [Exception Guideline](#)

Infection Control

The NWNODN has an agreed guideline supporting admission processes in relation to infection control. This guideline is to ensure that the agreed level of infection prevention screening has taken place ahead of a transfer for repatriation to an infant's local neonatal unit or for elective transfer for continued neonatal medical/surgical care. The use of an agreed approach to

infection prevention screening ahead of such transfers provides assurance to the receiving neonatal unit and avoids any delays in patient flows. It is acknowledged neonatal transfer for intensive care (uplift transfers) are urgent and do not require infection prevention screening before acceptance of transfer.

Link to Guideline: [Infection Control](#)

High Risk Fetal Anomaly and specialist care

Within the NWNODN neonatal surgical, cardiac services, speciality paediatrics services are provided on a regional basis in Saint Mary's Hospital and within the Liverpool Neonatal Partnership (Liverpool Women's Hospital/ Alder Hey Hospital).

There are a number of guidelines which outline pathways for specific conditions:

- [Care of Neonates with Hydrocephalus](#)
- [Perinatal management of the fetus with antenatal diagnosed cardiac disease \(CHD\)](#)
- [Management of Patent Ductus Arteriosus \(PDA\)](#)
- [Acute Post Natal Cardiac Pathway](#)
- [Postnatal Surgical Referral Pathway](#)
- [ECMO Neonatal Referral Pathway](#)

Inpatient care

Advice

This guideline aims to standardise the mechanism for clinical advice across the NWNODN providing clarity on when, how and from whom advice should be sort. Although this is not directly a pathway guideline it does offer clinicians guidance on when transfer should take place and appropriate communication around this.

Link to Guideline: [NWNODN Advice Guideline](#)

Cooling

This guideline outlines the requirements in the NWNODN for cooling. Currently across the NWNODN all NICUs provide active cooling alongside a number Local Neonatal Units (LNUs). The LNUs providing active cooling initiate and manage the Cooling treatment until Connect North-West, are able to transfer the infant to an appropriate NICU for on-going management and care.

Link to Guideline: [HIE-Cooling Guideline](#)

Palliative Care

The NWNODN guideline and accompanying suite of documents assist health care professionals with the care provision for infant requiring palliative care. It aims to standardise best practice in order to provide the highest standard of family-centred care at this painful time. The guideline covers possible pathways from the antenatal period.

Link to Guideline: [NW Neonatal Palliative Care Guideline](#)

Discharge

Repatriation

When a baby requires neonatal intensive or tertiary specialised care the baby is transferred to the nearest appropriate neonatal intensive care unit (NICU) as described in the North West Neonatal Operational Delivery Network (NWNODN) pathways. Once the baby is stable, and

the level of care they need matches that provided by a LNU or SCU, repatriation will need to be arranged. These repatriations are elective and should, where possible, be planned at least 24 hours in advance

Link to Guideline: [Repatriation Guideline](#)

References

Toolkit for High Quality Neonatal Services:

https://webarchive.nationalarchives.gov.uk/20130123200735/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_107845

Optimal arrangements for Local Neonatal Units and Special Care Units in the UK including guidance on their staffing: A Framework for Practice <https://www.bapm.org/resources/2-optimal-arrangements-for-local-neonatal-unitsand-special-care-units-in-the-uk-2018>