Yorkshire and Humber Neonatal ODN (South) Clinical Guideline

Title: Indications for Tertiary Centre Consultation and/or Neonatal Transfer

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This clinical guideline has been developed to ensure appropriate evidence based standards of care throughout the Yorkshire and Humber Neonatal ODN (South). The appropriate use and interpretation of this guideline in providing clinical care remains the responsibility of the individual clinician. If there is any doubt discuss with a senior colleague.

1. Background

The Neonatal Toolkit requires all Neonatal Networks to have defined indications for inter-hospital transfers[1].

The indicators within this guideline provide a baseline for responding to any individual baby's clinical condition. They are evolving criteria, which are anticipated to adapt in response to local audit, advances in clinical care and increasing capacity in tertiary centres.

Absolute indicators for transfer are described as well as clinical indicators, which should prompt local clinicians to consider discussion with the Network Lead Neonatal Unit Consultant.

Please note these are guidelines. Occasionally on an individual patient basis, they will not be appropriate. However, units are encouraged to have discussion with the Level 3 centre

2. Aims

The Yorkshire and Humber Neonatal ODN aims to provide high quality care for all babies within the network. This sometimes requires the transfer of babies, both between network hospitals, and to hospitals outside of the network for some specialist services e.g. paediatric cardiology. Our aim is to continue to ensure that the right baby receives the right care in the right place at the right time.

This guideline aims to support the continued improvement of neonatal care in our network by:

1. Defining absolute indications for transfer to a Level 3 Neonatal Intensive Care Unit
2. Using clinical trigger points to increase early consultation and advice between network units. This will not always result in transfer of the patient to the tertiary centre.
3. Ensure that early transfer is facilitated in infants where the early use of other treatment modalities (such as HFOV and inhaled nitric oxide) will be beneficial as these interventions are less efficient when there is a delay in initialising
4. Promoting feedback on the management of neonates who require transfer

3. Areas outside remit

The focus is upon postnatal clinical indicators. Therefore, this document does not include guidance for *in utero* transfers, transfer due to capacity problems or criteria for appropriate back transfer.

Absolute Indications for Neonatal Transfer

Any baby in a Level 1 (also see below) or 2 unit meeting any one of the following criteria should be transferred to an appropriate Level 3 centre for continuation of care. The urgency of transfer will be determined by assessment of each individual case.

1. **Gestational age at birth**
    a. **< 27^{+0} weeks singleton**
    b. **< 28^{+0} weeks twins**

    Ideally this group of patients will be transferred *in utero* to an appropriate centre. However, there will continue to be occasions where this is not possible and early transfer should be performed as soon as possible after delivery.

2. **Birth weight < 800g, any gestational age**

3. **Babies with hypoxic-ischaemic encephalopathy requiring total body cooling or assessment for total body cooling**
    Please refer to the Network guideline for more details. Rectal temperature monitoring should be used and TOBY protocols for passive cooling followed.

4. **Surgical conditions requiring specialist assessment**
    For example necrotising enterocolitis not responding to medical management, perforation, suspected malrotation and volvulus, gastroschisis, diaphragmatic hernia, encephalocoele etc.

5. **Cardiac conditions requiring specialist assessment**
    For example, duct-dependent lesions, cardiac arrhythmia etc.

For level 1 units, in addition to the above, any baby meeting any of the criteria below should be transferred to an appropriate unit which may be a level 2 or 3 centre for continuation of care

1. **Gestational age at birth < 32 weeks**

2. **Birth weight < 1500g, any gestational age**

3. **Babies requiring intubation and ventilation**

Indications for seeking advice from a Level 3 centre

The following clinical indicators should be used to prompt early discussion and advice from a Consultant Neonatologist within a Level 3 centre. Such discussions may, or may not, result in transfer of the infant. In certain cases, additional specialist advice will also be required, for example, from a paediatric cardiologist, paediatric surgeon or neurosurgeon.
Discussion should be at a consultant to consultant level. Although at times for training, a trainee could undertake these discussions under direct consultant supervision.

Early discussion aims to:

- Support the care of neonates in a unit local to their home
- Increase support for staff working in Special care and Local Neonatal Units
- Potentially reduce the number of transfers
- Facilitate early transfer where other treatment modalities may be required as there is improved efficacy when these modalities are started earlier
- In infants who do require transfer ensure this occurs at the 'right time' to reduce potential harm to the infant and improve outcomes

The on-call Consultant can be accessed directly see Appendix 1. or via Embrace (0845 1472472).

Clinical indicators for seeking advice

Consultant to consultant discussion with the Network Lead Centre should be considered in the following clinical circumstances.

1. Any infant who is not progressing as anticipated

2. Extremely low birth weight and those with significant intra-uterine growth restriction
    a. Infants > 30 weeks gestation who weigh < 1000g with abnormal antenatal dopplers

3. In Level 1 units, any infant with hypotension, disseminated intravascular coagulation (DIC), renal failure or metabolic acidosis or requiring an umbilical venous catheter

4. Respiratory
    a. Respiratory status not responding to appropriate interventions. These infants may potentially benefit from HFOV or inhaled nitric oxide therapy.
    Consider infants with:
        i. progressively worsening or persistently poor blood gases (pH <7.22) on 3 consecutive blood gases over a six hour period despite appropriate interventions
        ii. increasing oxygen requirements or persistently high oxygen requirements > 60% for 6 hours despite appropriate interventions
        iii. increasing pressure requirements or persistently high (≥26 cmH_20) pressure requirements for 6 hours
    b. Infants requiring ventilation AND inotrope/prostin/insulin infusion/chest drain or exchange transfusion
    c. Infants requiring ventilation for >48 hours[1]

d. Mechanically ventilated infants with airway anomalies e.g. cleft palate
e. Meconium aspiration requiring mechanical ventilation
f. Infants requiring high flow/CPAP support in a Level 1 centre outside of local guidance

5. Cardiovascular
    a. Known or suspected cardiac anomalies requiring assessment
    b. Known or suspected persistent pulmonary hypertension
    c. Cardiac arrhythmia
    d. Cyanosis despite oxygen therapy
    e. Hypotension unresponsive to initial volume and first-line inotropic support (Please refer to Network Hypotension Guideline)

6. Neurological
    a. Infants who fall outside the criteria for total body cooling, for example gestational age 35^{+6}, but the referring unit feel this intervention may be appropriate

7. Any infant requiring specialist assessment, investigation or treatment which is not available in the local unit e.g. renal, metabolic disease, exchange transfusion, MRI scan

Audit Criteria

- Absolute indications for neonatal transfer
- Infants ventilated for more than 48 hours in a Local Neonatal Unit
- Outcome/location of care for infants meeting the criteria

References

1. Toolkit for High-Quality Neonatal Services, Department of Health 2009
2. NHS England Service Specifications. Neonatal Critical Care E08/S/a.

Appendix 1 Referral and Transfer Pathways in Yorkshire & Humber

All level 3 units will provide:

- **General neonatal medicine**
- **HFOV**
- **Nitric oxide**
- **Ophthalmology**

Bradford and Jessop Wing will also provide metabolic medicine.
Leeds General Infirmary accepts cardiology and cardiac surgery referral as well as hepato-biliary problems including transplantation.

	Level 3 Unit	Surgical referrals	Cardiac Referrals
Barnsley Bassetlaw Chesterfield Doncaster Grimsby Rotherham Scunthorpe	Jessop Wing, Royal Hallamshire Hospital	Following clinical discussion: < 1.5kg Jessop Wing >1.5kg Sheffield Childrens Newborn Surgical Unit/PICU	Leeds General Infirmary
Airedale Calderdale	Bradford	Leeds General Infirmary*	Leeds General Infirmary
Scarborough York	Hull Royal Infirmary	Following clinical discussion: Hull Royal Infirmary (general surgery only) or Leeds General Infirmary*	Leeds General Infirmary
Dewsbury Harrogate Pinderfields St James Hospital, Leeds	Leeds General Infirmary	Leeds General Infirmary*	Leeds General Infirmary

*** Surgical referral to LGI should be made via the registrar on-call from 8am to 10pm.**

Switchboard telephone numbers for Level 3 Centres

Bradford Royal Infirmary

Switchboard	**01274 542200**
Neonatal Unit	**01274 364523**

Hull Royal Infirmary

Switchboard	**01482 328541**
Neonatal Unit	**01482 604391**

Leeds General Infirmary

Switchboard	**0113 2432799**
Neonatal Unit	**0113 3927443**

Jessop Wing Royal Hallamshire Hospital

Switchboard	**0114 2711900**
Neonatal Unit	**0114 2268456**

Sheffield Childrens' hospital

Switchboard	**0114 2717000**