East Midlands Neonatal
Operational Delivery Network

NETWORK GUIDELINE

Guideline:	**Referral for Surgical Assessment (North Hub)**
Version:	**4**
Date:	**September 2018**
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Approval:	**EMNODN Clinical Governance Group**
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Consultation:	**EMNODN Clinical Governance Group**
Distribution:	**Neonatal Units within EMNODN North Hub**
Risk Managed:	**Access for babies and their families requiring surgical assessment (excluding cardiac)**

This document is a guideline. Its interpretation and application remains the responsibility of the individual clinician, particularly in view of its applicability across the different Trusts in the East Midlands Neonatal Operational Delivery Network – North Hub. Please also consult any local policy/guideline document where appropriate and if in doubt contact a senior colleague.

Caution is advised when using guidelines after a review date.

REVIEW AND AMENDMENT LOG

Version	Type of Change	Date	Description of Change
1	-	-	-
2	-	-	-
3	-	-	-
4	Minor	Sept 2018	Organisational

Introduction

This guideline is to enable appropriate and prompt access for babies and their families requiring surgical assessment (excluding cardiac). It covers the usual referral pathways for both antenatal and postnatal transfers. It is beyond the scope of the guideline to cover all the many individual conditions and their management but does outline some general principles and cross references to other guidelines where possible.

Referrals

Antenatal

Antenatal scans may reveal a diagnosis where early surgical intervention is predicted and delivery in the tertiary centre desirable e.g. diaphragmatic hernia, abdominal wall defects. Early discussions with the surgical team help with consistency of information and the consent process. Where there is no local fetal medicine service, referral to one of the fetal medicine units in Nottingham is the usual practice for confirmation of diagnosis; a referral from here will than be made to Mr Davies. If referral is other than obstetrician to obstetrician please refer by letter and/or phone to Mr Brian Davies (Consultant Paediatric Surgeon, Queens Medical Centre; secretary ext 62592 or page via switchboard). He will make the necessary arrangements with the family and Obstetric services. The management of ongoing antenatal care and planning of delivery will be made by the relevant obstetric teams and depends on services available locally. The local paediatric team should be kept involved (a named paediatrician is helpful) as they often have long-term involvement with the family. Referral information should clearly state which paediatric staff are already involved with a family and what information has already been given.

Scans may indicate a diagnosis where the postnatal course and need for surgery is less predictable e.g. dilated bowel loops, cystic adenomatoid malformation (CAM), now known as Congenital Pulmonary Airways Malformations (CPAM). While on-going care and delivery in a local centre would be usual, early discussions with the surgical team and a single visit can be helpful. Referral can be made as above.

The following table gives some indication of conditions where surgical referral is appropriate

Refer antenatally and deliver in tertiary unit	**Deliver in DGH (discuss post-natally with surgeons)**
CDH (Congenital Diaphragmatic Hernia	CCAM/CPAM (without hydrops / mediastinal shift)
OA (Oesophageal Atresia) / TOF (definite) (Tracheo –Oesophageal Fistula)	
Gastroschisis	
Exomphalos	
	NTDs
Sacrococcygeal teratoma	
Duodenal atresia	
Significant airway problems e.g. large cystic hygromas, other neck masses	
	Other renal problems (without oligohydraminos)
Vein of Galen malformations	

When neural tube defects are identified these should be referred antenatally, these should be referred to Maria Cartmill, Paediatric Neurosurgeon QMC, and this can usually be arranged through the Feto-maternal Clinic (FMC). Delivery in the local unit is usually possible and immediate postnatal transfer rarely needed. It is preferable for mum and baby not to be separated. The timing of the transfer should be discussed with the tertiary unit and the paediatric neurosurgical team.

For complex cases with multiple problems that include surgical issues these again can be discussed with Mr Davies.

Where major nephrological/urological anomalies are detected, the usual referral pathway is the Fetal Medicine team at QMC in conjunction with the Paediatric Nephrology team.

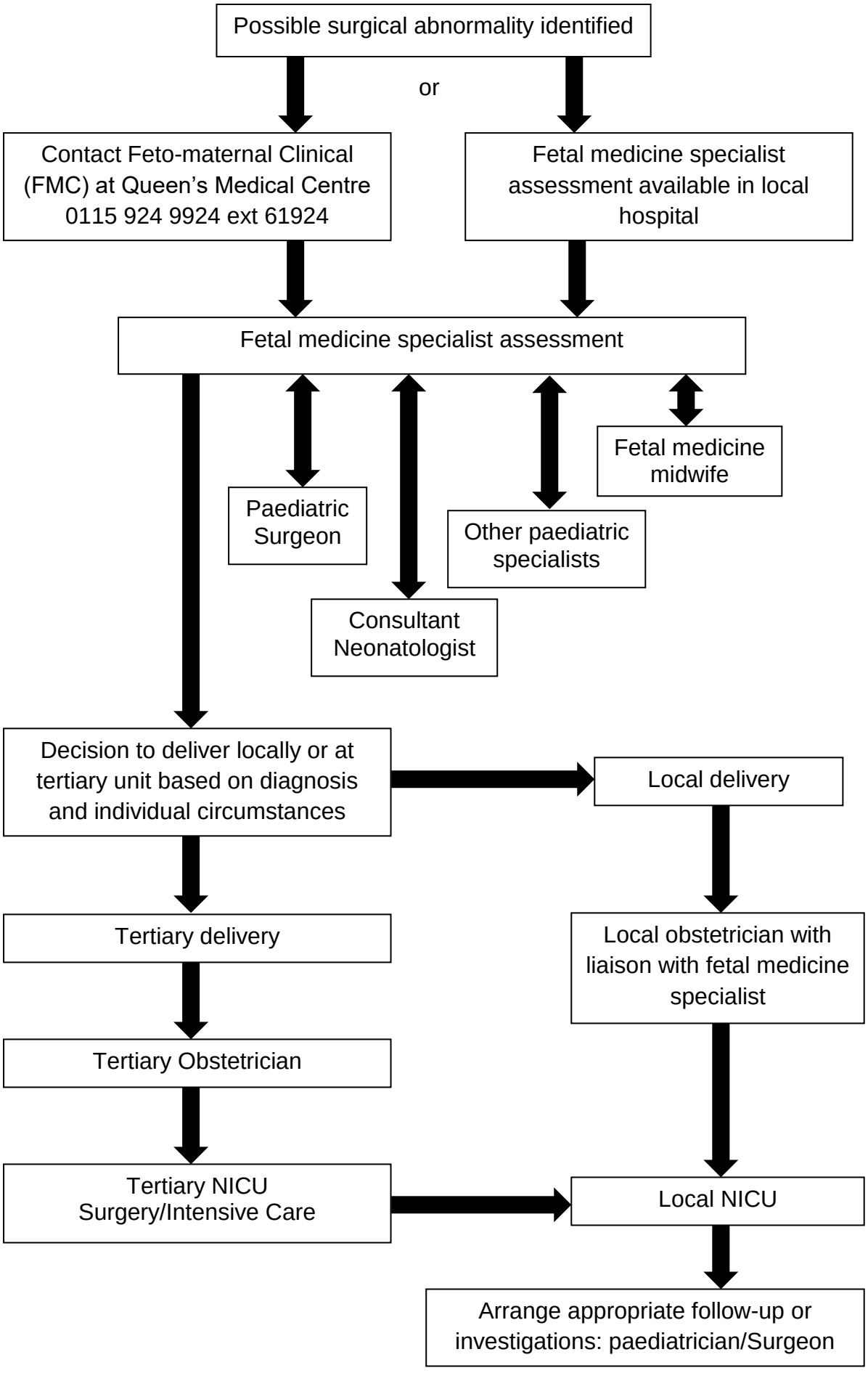
The antenatal pathway is outlined in the flowchart on page 5.

Postnatal

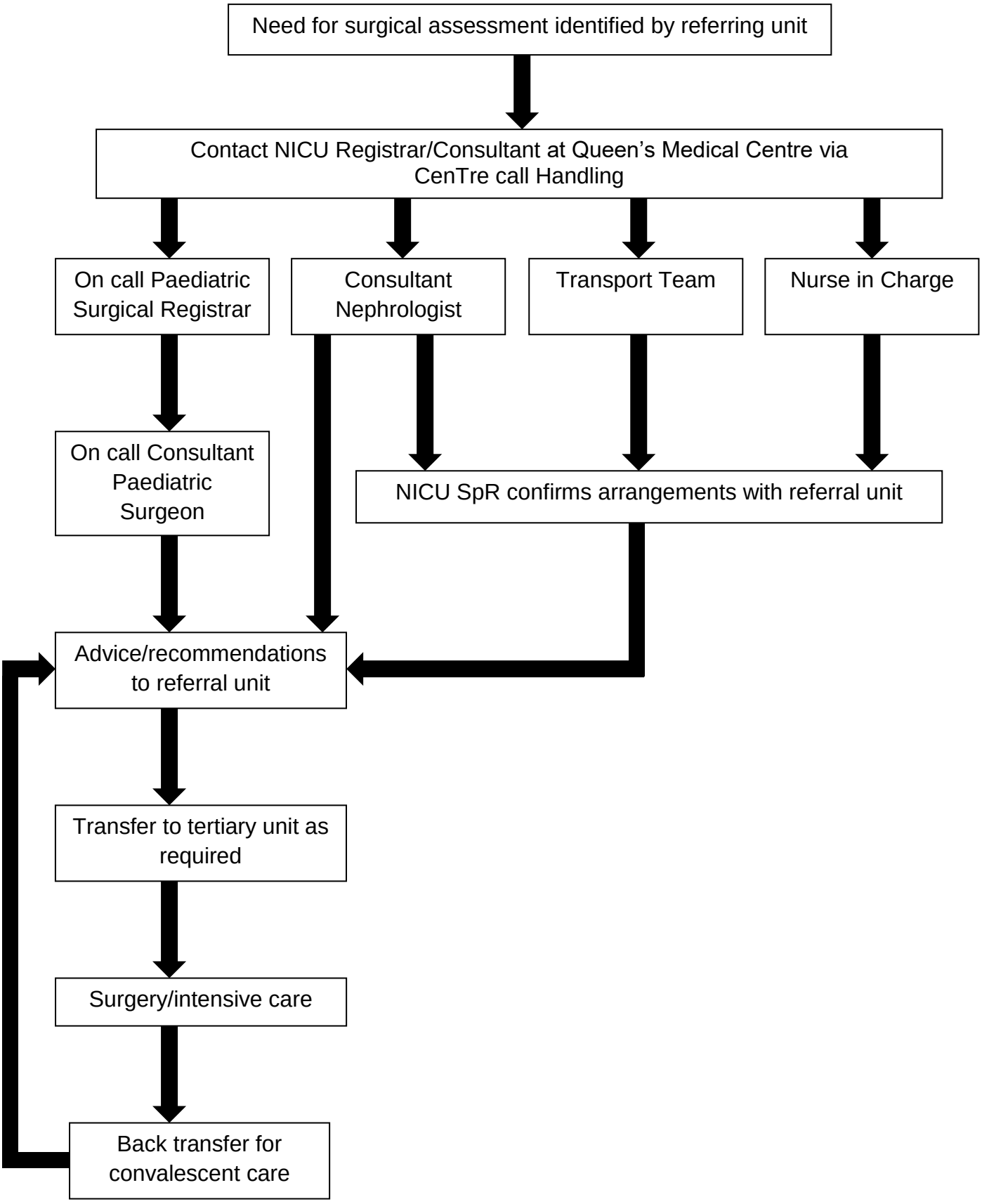
Postnatal transfers for surgical assessment may be acute e.g. diaphragmatic hernia, gastrointestinal perforation or non-acute e.g. ano-rectal malformation.

The postnatal pathway is outlined in the flowchart on page 6..

Antenatal Referral Flowchart



Postnatal Referral Flowchart



If unable to transfer to QMC due to lack of beds, CenTre call handling to connect to transport team for referral and bed-finding

Acute Transfers

The local team are responsible for resuscitation and stabilisation while awaiting the transport team. Close liaison between the tertiary and local team is required to optimise pre surgery condition and will need to be individualised for each baby. The principles in preparing for transfer are detailed in the separate EMNODN Transport Stabilisation Guideline[1]. For the specific conditions given below some principles, taken form the transport guideline, are outlined but these must be considered in the context of the general care given in the Transport Stabilisation Guideline.

Gastroschisis[2]

Problems:

1. Hypovolaemia due to fluid loss from the exposed bowel
    a. Reduce losses – place baby in a Bowel bag (Vi-Drape bag) up to their armpits (NB – in antenatally diagnosed cases the parents should have a bag given to them). No nappy needed. If no bag – use clingfilm.
    b. Give fluid. They may need 20-60ml/kg in the first six hours. Assess volume status frequently by measuring losses in plastic bag (difficult), blood pressure, toe/core temperature gap trend and by estimating capillary refill time. Replace volume with 4.5% Human Albumin Solution in 10ml/kg aliquots. This should be instituted prior to arrival of the transport team, who will continue this regimen.
2. Hypothermia
    a. Reduce heat loss – place in bag as above
    b. Overhead warmer
    c. Measure
3. Bowel ischaemia (black/purple, poorly perfused bowel),
    a. Positioning is the key. Place the baby on their side with the intestines in front of them. Do not let the intestines drag or be pulled away from the baby
    b. Twisting – check the bowel is not twisted (difficult)
    c. Discuss with surgical team

Congenital diaphragmatic hernia[3]

Always ventilate and muscle-relax infants with CDH. Position with hernia side down. Place a large-bore (Min. 10 FG) naso-gastric tube on free drainage with regular aspiration to decompress the gut.

Discuss detailed pre-transfer management with receiving centre.

Oesophageal atresia/tracheo-oesophageal fistula.

Place a replogle tube in blind end of oesophagus. Nurse infant with head up. Ensure secretions are not allowed to build-up in the proximal oesophageal pouch by application of either continuous low-pressure suction (5-10cm/H_2O) or by intermittent aspiration (minimum of every 15 minutes). A small amount (0.2 – 0.5ml) of 0.9% Saline may be instilled into the smaller replogle lumen, in order to loosen secretions every 15 minutes.

Try to avoid ventilating babies who have both oesophageal atresia and a tracheo-oesophageal fistula, as a connection between the airways and the distal gut is a feature of the condition and ventilation may lead to massive irreducible gut distension. Discuss with surgical centre if this is necessary – it is an indication for urgent transfer and probable surgery on arrival.

Gastro-intestinal obstruction (including NEC[4]/perforation/ileus, etc)

Place a naso-gastric tube on free drainage with regular (minimum 2hrly) aspiration. Replace NG losses if over 10ml/kg/day. Obtain abdominal X-Ray. Meticulous fluid balance should be

kept. If perforation is causing gross abdominal distension sufficient to cause significant respiratory compromise, consider needle decompression. Clean skin with aqueous chlorhexidine. Insert a 21G cannula at right angles to the skin in the right lower quadrant just sufficient to enter the peritoneal cavity (usually <1cm). Take care to ensure that the liver is not enlarged or displaced into this area. Allow gas to escape then remove cannula and seal exit point. Discuss with surgical team if in any doubt.

Preparation for the Acute Transfer

Resuscitation and stabilisation can often be challenging and close liaison between centres is required to address the immediate problems. Documentation and communication are essential (see 1 for details). Getting to surgery as soon as possible may be life saving so minimising avoidable delays is crucial. Make sure documentation (including all x-rays), any required samples (especially maternal blood clearly and completely labelled), infusions and fluids are ready and prepared in a way to reduce transfer time. Radiology can be sent electronically, however if this is not possible, then get the local radiographers to prepare a CD to bring with baby.

Non-acute transfers

When a non-acute transfer is required e.g. a well baby with ano-rectal malformation, the referral and transfer can usually be done during the working day. The referral pathway detailed in the postnatal referral flowchart on page 6 i.e. through the NICU registrar at QMC.

Those with intestinal obstruction, e.g. duodenal atresia, many anorectal malformations will need an NGT and ivi and be NBM until transferred & assessed

Family Care

Transfer between units is a source of stress and anxiety for families. To minimise this ensure parents are informed as early as possible that transfer is needed or being considered. Where an infant is transferred for specialist care the probability of return transfer to the local unit should be raised. Prepare parents for the change of unit base by reassuring them that high standards of neonatal care are in place at all network units. Give the parents an information pack regarding the receiving unit if available (see 1 for details).

Consent

Valid consent can only be obtained by a surgeon who is capable of performing the procedure. Consent may usually only be given by:

- Either parent, if they were married at the time of the baby's birth, OR
- The baby's mother, if the parents are not married.
- Unmarried father's only if they are named on the birth certificate (thus, only possible after the mother has registered the birth). Only applies to children born after Dec 2003.
- If a person appropriate to give consent will be at the surgical centre before surgery is required, then inform this person that it is essential that they keep this arrangement, so that consent may be obtained by a surgeon. Also obtain details of phone numbers where the appropriate person(s) may be contacted by the surgical team if surgery is needed before they come to Nottingham.

Document this clearly in the notes.

If surgery may be required following transfer, but before a valid consent-giver will be present in the receiving centre (nor contactable by telephone) then it will be necessary for the referring and receiving centre consultants, including the surgical consultant, to discuss the possible options.

Failure to stabilise

If the baby remains very unwell and unstable following a period of stabilisation by referring and/or transport teams, consideration should be given as to the best course of action. There are no clear rules for this situation. Factors which may need to be considered are:

Is the baby dying? There should be a discussion between the Consultants in the referring and receiving centres, transport team and local nursing staff.

- If this is the case then it is most appropriate for the baby to die in the referring centre with the parents present.
- It may be necessary for the team to prolong their stay to help with the withdrawal process, but this will be determined by the needs of the referring centre.

Might surgery at the end of transfer retrieve the baby in extreme circumstances? Transfer may be undertaken if:

- the transport team feels the baby has a chance of surviving the journey,
- the baby is an appropriate candidate,
- the parents are aware of the risks of transfer.

References

1 EMNODN Transport Stabilisation Guideline
2 Clinical guideline for abdominal wall defects
3 Clinical guideline for congenital diaphragmatic hernia
4 Clinical guideline for Necrotising Enterocolitis