TRANSPORT AND REFERRAL

DEFINITION
Transfer of critically ill newborns from hospital of birth to a tertiary care facility for ongoing intensive care or surgical/cardiac assessment, or back from tertiary or secondary care facility to hospital of birth

For further information on transport of newborns in the Midlands, see www.newbornnetworks.org.uk/southern/PDFs/NTSOperationalPolicyOct08.pdf

INDICATION
• Preterm babies requiring intensive care not available at base unit
• Babies requiring:
  • surgical care or review
  • cardiology review or care
  • drive-through surgical procedures
  • diagnostic procedures (e.g. CT scan, MR scan, contrast study)
• return transfer for ongoing care

RETRIEVAL PROCESS
Communication
Referring centre
• Make decision to transfer with parents’ agreement
• Locate NICU/PICU bed or contact cot locator bureau for cot

In the event of possible unavailability of a level 3 cot, referring consultant and consultant in level 3 unit must discuss to determine whether another infant not requiring intensive care could be moved to a level 2 unit to facilitate transfer of baby requiring intensive care within the region

• Provide clinical details to Newborn Transport Service (NTS)/receiving centre/surgeon
• If baby deteriorates further, inform NTS/receiving unit
• Document advice given/received
• Prepare copy of baby’s notes, X-rays and transfer letter
• Obtain parental consent for transfer
• Obtain sample of mother’s blood (if required)

Receiving centre
• Ensure consultant and NICU/PICU co-ordinator agree to accept referral
• Transport team to give details of management before departing for receiving centre

Newborn Transport Service (NTS)
• Ensure consultant agrees for NTS to carry out transfer
• Inform NTS of transfer
• Give clinical details, interventions and medications
• NTS will organise ambulance and response time
• NTS will ensure appropriate staff and equipment available for transfer

Parents
• Update with plan of care
• Ensure parents aware that transport is in baby’s best interests and warrants the upheaval and added risks
• Give unit information and contact number and map
• Photographs of baby
• Determine method of feeding
• Show baby to parents before departure
• Ensure mother is transferred nearer to baby as soon as possible
• Ensure baby is transferred back as soon as possible
STABILISATION BEFORE ARRIVAL OF NTS OR BEFORE TRANSPORTING

Preparation for transport begins as soon as decision made to transfer baby
- Ensure X-rays are sent with baby
- Ensure all tubes and lines are very securely taped
- Change underwater seal drains to Heimlich flutter valve
- Ensure there are TWO reliable IV access sites
- Prepare extra fluid boluses for gastroschisis and septic babies

Monitoring
- Monitor temperature throughout stabilisation process and transit
- Document temperature before and after stabilisation, on arrival back at retrieval unit and throughout transport process
- Check blood glucose
- Monitoring for transit see below

SPECIAL CONDITIONS

Always discuss baby’s clinical condition with surgical team to finalise management plan before and during transport

Necrotising enterocolitis
- Largest possible naso- or oro gastric tube on free drainage
- Nil by mouth
- IV fluids
- Check clotting and consider administration of FFP/extra vitamin K
- Antibiotics:
  - benzylpenicillin, gentamicin and metronidazole (see NEC guideline)
  - If UAC in situ, do not remove
  - AP and lateral shoot-through X-rays if indicated
  - If hypotensive or acidicotic, ventilate

Oesophageal atresia/tracheo-oesophageal fistula
- Largest possible naso- or oro gastric tube
- On continuous drainage and aspirated at least every 10 min to keep pouch empty
- Suction mouth with standard suction catheter if required
- Nurse prone with head tilted

Abdominal distension or suspected bowel obstruction
- Largest possible naso- or oro gastric tube
- On free drainage and aspirated regularly
- Document amount and type of aspirate
  - if aspirate >20 mL/kg, replace with sodium chloride 0.9%
  - IV fluids, and correction of shock
  - AP (and, if perforation, lateral shoot-through) X-rays
  - Do not instrument anus
  - Nurse in supine position
  - Ventilate if hypoxic or significant distension

Congenital diaphragmatic hernia
- Do not use bag and mask ventilation
- Intubate and ventilate
  - compliant lung ventilation to avoid barotrauma or pneumothorax (no hyperventilation)
  - ventilate in 100% oxygen regardless of saturations
  - largest possible naso- or oro gastric tube on free drainage
  - Aspirate regularly at least every 10 min to decompress stomach
  - Keep baby well sedated and paralysed if fighting ventilator
  - Surfactant not usually indicated (see Surfactant guideline)
• Keep head tilted upwards where possible (never allow head down position)
• Observe for pneumothorax (unaffected side)

**Pneumothorax/pneumomediastinum**
• Pneumothorax not under tension does not require drainage
• Keep saturations high
• Tension pneumothorax requires drainage
• If pneumomediastinum present, place infant in ambient oxygen concentration of 100% to enhance absorption of gas collection

**Choanal atresia**
• Provide oropharyngeal airway
• Do not feed for at least 2 hr before transfer
• Observe breathing pattern during transfer

**Pierre Robin micrognathia**
• If respiratory distress, insert oropharyngeal or nasopharyngeal airway
• Discuss endotracheal intubation with referring or receiving consultant before any attempt is made; expect to seek help from an experienced anaesthetist
• Airway patency can be improved by nursing and transferring, in prone position

**Neural tube defects meningocele, encephalocele**
• If sac ruptured, apply sterile dressing
• Nurse in prone position to prevent pressure on lesion
• Cover back with cling film to prevent stool contamination
• IV antibiotics: amoxicillin and gentamicin

See also [Gastroschisis](#) and [Congenital heart disease](#) guidelines

**PACKAGING, MOVING AND OTHER ISSUES**

**Minimise handling on transit**

• Move baby into transport incubator
• Ensure smooth transfer and minimise heat loss
• Identify staff responsible for:
  • Transferring baby from incubator to transport incubator
  • Infusion lines
  • Opening and closing incubator doors
• Inform receiving unit of baby’s condition and predicted time of arrival
• Mother may accompany only if baby stable and at discretion of NTS transport team

**DURING TRANSIT**

• In ambulance:
  • Secure transport incubator
  • Mains or battery supply
  • Oxygen and air supply
• Minimise handling: if any handling required, stop ambulance in a safe place
• Avoid hypothermia by minimising interference (see [Hypothermia](#) guideline)

**Monitor**

• Heart rate, respiration, blood pressure and temperature continuously
• Record readings every 15 min and note type and volume of infusions
• If central access used, ensure umbilical stump visible and observe for any bleeding
• Monitor peripheral IV site/s for any leakage and patency
• Ensure any peripheral arterial line site visible

**AT RECEIVING UNIT**

• When moving baby from transport incubator to incubator, identify staff responsible for:
- transferring baby from transport incubator to incubator
- infusion lines
- opening and closing incubator doors
- Hand over care to medical and nursing staff
- Photocopy all transport and referring documents and give to receiving team. **DO NOT** leave receiving unit until this has been done as you are asking them to be responsible for ongoing care and part of transport of baby
- Give receiving team X-rays/disk
- When baby settled, check and document blood gases, BP, temperature and blood glucose
- Inform referring centre and parents of safe arrival of baby
- Complete documentation and provide receiving unit with photocopy before you depart

**Do not leave a baby at a unit without all necessary documentation. It is not acceptable to fax information to them at a later hour or date**

**ON RETURN TO BASE**
- Stock up equipment bag
- Check transport incubator
- Replace oxygen and air cylinder if needed
- Complete documentation

**EQUIPMENT FOR TRANSFER**

**Check all equipment daily and prepare before use**

- Transport incubator
- Ventilator
- Gas cylinders
- CPAP
- Incubator oxygen
- Suction
- Humidification device
- Thermoregulation equipment, including mattresses
- **Self-inflating bag-valve-mask**

**Monitoring facilities**
- Heart rate
- Respiratory rate
- Saturations
- Invasive blood pressure
- Temperature toe and core
- Glucose monitor
- Infusion pumps: 6 for ICU and 3 for SCBU babies

**Emergency drugs**
- Sodium bicarbonate 4.2% (or 8.4% diluted 1:1)
- Adrenaline 1 in 10,000
- Glucose 10%
- Sodium chloride 0.9%

**Equipment bag**
- Camera
- Documentation
- Parent information leaflet
• **Intubation**
  - laryngoscopes
  - endotracheal tubes (ETT) 2.5 mm to 4 mm
  - introducers
  - hats and ties/clips for ETT
  - scissors

• **Cannulation**
  - selection of cannulae (Jelco 24 g, Insytes with or without wings 24 g, Neoflons 24 g)
  - strapping
  - dressing packs
  - Sterets
  - cleaning lotion

• **Umbilical catheterisation** (see UVC and UAC guidelines)
  - arterial catheters
  - venous catheters
  - forceps
  - probes
  - sutures
  - cord ties
  - zinc oxide tape
  - non-alcohol containing cleaning lotion

• **Thoracocentesis**
  - 21 G green butterfly (can use blue to aspirate air easily and reduce pain)
  - small bottle of sterile water
  - selection of chest drains (size 8 ch to 12 ch)
  - dressing packs
  - scalpel
  - Spencer-Wells forceps
  - clamps
  - syringe and needles
  - local anaesthetic (lidocaine 1%)
  - Steristrips
  - Tegaderm
  - flutter valves