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 care facility to hospital of birth

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, barium meal)
- 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 the transfer of the 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 transferred nearer to baby as soon as possible
- Ensure baby transferred back as soon as possible

STABILISATION BEFORE ARRIVAL OF NTS OR BEFORE TRANSFERRING

Preparation for transport begins as soon as decision made to transfer baby

- Ensure X-rays are sent with baby
- Ensure all tube and lines 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

Necrotizing enterocolitis

- Largest possible naso-/orogastric 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 acidotic, ventilate

Oesophageal atresia/tracheo-oesophageal fistula

- Largest possible naso- or orogastric 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

- Large naso- or orogastric tubes 8 or 10 FG
- 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 orogastric 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
- Avoid feeding 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

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

- Apex, 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 the receiving unit until this has been done as you are asking them to be responsible for the ongoing care and part of the transport of the baby
- Give the 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 the 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

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
- Glucose
- Sodium chloride 0.9%

Equipment bag

- **Intubation**
- laryngoscope
- 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

- Camera
- Documentation
- Parent information leaflet