The Northern Neonatal Network
An Operational Delivery Network
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Guideline for the transfer of infants with possible need for urgent surgical intervention for NEC or similar pathology

V 2.0 May 2014

Due for review – August 2015

Northern Neonatal Network guideline

Guideline for Transfer of infants with possible need for urgent surgical intervention for NEC or similar pathology

Purpose and summary

This guideline has been produced to guide management of infants who may require urgent surgical intervention and require inter-hospital transfer. It represents current consensus and has been produced following a Network working group and widespread consultation, including input from the Paediatric Surgical team at the RVI. Review was undertaken after audit of process and outcomes in May 2014.

Management at local unit

Prompt recognition of the potential need for transfer facilitates safe and effective transfer, and maximises the ability of the neonatal surgical team to assess, prioritise and plan intervention. The process must work effectively 24/7, so direct consultant supervision of cases, and direct consultant-to-consultant referral will be needed on a regular basis 'out of hours'.

A baby with a recognised deterioration will usually require:

- Urgent senior review – in most cases at consultant level with appropriate written documentation.
- Senior (consultant) review of x-rays is needed to ensure relevant pathology is detected and acted upon quickly
- Early discussion with the on call neonatal consultant at the RVI (contact via ward 35 RVI 0191 282 5635)
- Audit data showed a proportion of perforations and other serious pathology was not detected by junior staff. Senior x-ray review is required even out of hours.

Transfer

Indicators that transfer is needed

- Major abdominal pathology (sudden or discoloured abdominal distension, cardiovascular/respiratory compromise, or perforation on x-ray) - This baby requires extremely urgent transfer to a surgical centre.
- 'Failure' of conservative management – increasing cardiovascular compromise, rising CRP, decreasing platelets, ongoing distension or worsening erythema
- X-ray showing 'fixed loops' for more than 24 hours

Process:

Organisation

- Direct **neonatal consultant-to-neonatal consultant** discussion 24/7 – via ward 35 RVI. Because of logistics around urgent transfers and access to advice the neonatal consultant should be approached first. If surgical advice is needed it can be sought after discussion with neonatal consultant at the RVI. Registrar to registrar discussion should NEVER take place without the necessary consultant being informed, even 'out of hours'.
- If there is no immediately available intensive care cot on ward 35 RVI, arrangements will be made to transfer existing babies to other units (including PICU) to create space
- In the exceptional event where no space can be created, a joint discussion between the neonatal consultants at the referring unit and the RVI, the senior nurse (RVI) along with consultant paediatric surgeon and on call consultant for PICU, RVI will be needed to ensure safe and timely access to surgical intervention elsewhere
- **Information on the 'transfer for quaternary service' form should be collected and discussed at this point (see appendix).**
- This process includes categorising the transfer in terms of urgency as:
    - **Extremely urgent** – prioritise over all other activity and transfers (ECMO transfers may be the exception). Transfer team should aim to leave within 30 minutes of the decision regardless of shift changes. **Any perforation, or cardiovascular compromise = extremely urgent transfer.**
    - **Urgent** – clearly sick but *urgent* surgical intervention is not considered likely within next 6 hours. Transfer team should be in progress within 2 hours.
    - **Elective** –ongoing abdominal concerns but without any acute need or deterioration. Transfers should be planned so that the baby arrives within normal working hours.

Mechanism

- The nearest transport team to the baby should perform the transfer: this will be the fastest route for the baby to the RVI. This may mean deferring routine back transfers.
- The referring team's key priority is clinical management of the baby: planning of the transfer will be coordinated by the consultant at RVI and the transport team
- The transport teams should be contacted on the usual "Hotline" telephone numbers;
    - RVI 0191 2303020
    - JCUH 01642 854871

Preparation:

Clinical condition of the baby:

Some babies will not get better until surgical intervention occurs: transfer is their most urgent need, but their condition should be optimised within these limitations. Opportunities exist for optimising clinical status whilst the team is both en route for and transferring the baby. Infants who are extremely ill or have perforated will go to theatre as soon as possible on arrival. Items marked * are required for safe anaesthesia:

- **Fluid support**: this may be massive and is easily underestimated due to 'invisible' fluid loss in the abdomen. Many sick babies with NEC will require >60ml/kg over the first 12-24 hours
- **Blood pressure**: many require inotropes in addition to fluids: peripheral adrenaline is very effective, quick and easy to administer.
- **Venous access:** Central venous access is preferable, but only very occasionally essential. Most sick babies will benefit from referral to the surgical team rather than delaying transfer whilst this is secured.
- **Optimising haemoglobin**: transfusion should not be deferred because of transfer – blood can be given en route, or used as acute volume support before transfer*
- **Adequate platelet count** for operative intervention – platelet count must be urgently checked, and platelets given en route if necessary*
- **Managing coagulopathy**: consider FFP or equivalent and vitamin K for very sick babies likely to require laparotomy. Formal clotting test is preferable if possible to help guide further support, but treatment should not be delayed and products can form part of the fluid resuscitation before or during transfer*
- **Antibiotic** and antifungal cover: add metronidazole if not already done, and commence fluconazole prophylaxis if not already done. Ensure positive bacteriology is known to transfer team.
- Occasionally an **abdominal drain** may need to be considered in certain situations with massive abdominal distension. (discuss this with RVI consultant who will liaise with surgeons)
- **Timely transfer.** Spending longer than an hour 'stabilising' the baby may not be in the baby's best interests. If transfer is delayed for more than an hour for stabilisation, or transfer teams are with babies for more than one hour prior to leaving, any further management must be coordinated directly by the local consultant. There should then be further consultant-to-consultant discussions between RVI and referring teams.

Documentation to go with baby/be made available:

No administrative task should delay clinically urgent transfers, but the receiving team need relevant information to plan ongoing care.

- A **letter** outlining key events for the baby. **Badger letters alone are generally not helpful** since they may not reflect the key acute concerns and relevant antecedent events. A handwritten letter by someone who knows events is often more helpful. Information on past events that are important to the baby and

family, e.g. significant IVH, PDA (and treatment status), along with what the family understand about these are essential.

- A *photocopy* of infant notes. (If the baby is more than 2 weeks old, the last 7 days or so with key events may suffice)
- Most recent **Hb, platelet,** neutrophil count**, sodium, potassium,** creatinine (bold indicate needed for theatre) and any relevant changes in these parameters over the last few days
- Information on recent fluid support received, inotropes, vascular access and when these were established (including line insertion, tip position and verification)
- Parental contact details, where they are currently, and what they have been told
- Relevant x-rays to be transferred to RVI infinitt system.

Contact with the surgeons:

- As the referring team will be busy focussing on acute clinical care, it is the responsibility of the RVI neonatal consultant to ensure the surgical team and consultant are aware:
    - the baby is being transferred
    - likely time of arrival
    - apparent urgency of operative intervention
    - Occasionally a baby will require drainage of the abdomen before transfer: the neonatal team at the RVI will liaise between the surgeons and the local team to facilitate this.

Preparation for arrival at the RVI:

Time saving steps can be taken once the baby has been accepted for transfer, including:

- Registering the baby on e-record (inform B7 nurse RVI)
- Warning blood bank that the baby is en route if expected to go urgently to theatre and requesting:
    - An adult unit of packed cells
    - Platelets and octoplas if required
    - **Where possible and appropriate, the transfer team should bring a labelled sample for cross match purposes** with the baby. The admitting SHO on ward 35 is responsible for sending this to blood bank.
- Alerting the surgical team to the arrival of the baby immediately (ring the paediatric surgical registrar as soon as the transfer team arrive on ward 35 i.e. prior to moving from the transport incubator).
- Alerting the anaesthetist of the expected time of arrival and likely condition of the baby

Appendix

Transfer for quaternary service – to be used for referrals in for specialist (usually surgical) input V2 May 2014

These infants by definition require specialist input often urgently. The format that follows is designed to facilitate both management pre, during and after transfer, and timely access to theatre on arrival. **A form should be completed by BOTH the referring and receiving teams**. A copy of the referring teams form should travel with the baby and effectively acts as the majority of information needed in a more formal letter, saving duplication.

Section A - Referral details
Name ______________________________
Date of birth ________________________
Gestation ____________________________
Birth weight __________________________
Current weight ________________________

Call to RVI: Date _____________ Time ___________________
By whom ____
To whom ____

Acute concern: ____
____
____
Most recent x-ray date time and interpretation: _______________________________
____
____
Transfer to RVI system and RVI interpretation:
____
____

Current Condition:
BP_________ Hb _________Platelets ________Coag _________________________
Abdomen:
Discoloration ________________
Distension ___________________

Support:
Respiratory:
____
Fluid bolus – amount and nature since deterioration recognised:
____
____
Inotropes – what and when started:
____
Products:
Blood ____
Platelets ____
Coag ____

Advice given / received at initial phone call:
____
____
____
____
____
____
____
____

Categorisation of urgency of transfer:
To be agreed by referring and accepting neonatal consultant
Extremely urgent (EU) ___________
(Prioritise over most other transfers (ECMO transfers may be the exception). Team en route within 30 minutes of the decision for transfer).
Urgent (U) ______________
(Clearly sick but *urgent* surgical intervention is not obviously required- i.e no perforation or cardiovascular/respiratory compromise yet. Team en route to this baby within 2 hours).
Elective (EL) _____________
Ongoing abdominal concerns but **no acute deterioration**.

Transfer team nearest baby to move baby if U or EU
If this is not possible please state why _______________________________________
____
____
____
____
____

Actions at RVI after acceptance and before baby arrives (please time):

Registered on E record ____
Contact surgeons ____
Contact anaesthetists ____
Contact blood bank:
Make aware of transfer and potential need for urgent theatre _____________
- Requests made:
  - Blood ______________
  - Platelets ____________
  - Octaplas ____________
  - Other _______________

Section B – Transfer

Time arrival at baby ___________

Current Condition/support:
BP__________ Hb __________Platelets _________Coag ___________________________

Abdomen:
Discoloration ________________
Distension ___________________

Respiratory:
____
Cardiovascular:
____
____
Inotropes – what and when started:
____
Products:
Blood ____
Platelets ____
Coag ____
REMEMBER TO OPTIMISE Hb, Platelets and BP en route if theatre anticipated

Documents to travel:
Letter (not badger) ____________
Photocopy recent notes _________________
Copy of local quaternary referral form ________________

Update to RVI at time ____
Advice given / received ____
____
____
____
____
____
____
____
____

Actions during transfer:
____
____
____
____
____
____
____
____
Section C – Arrival

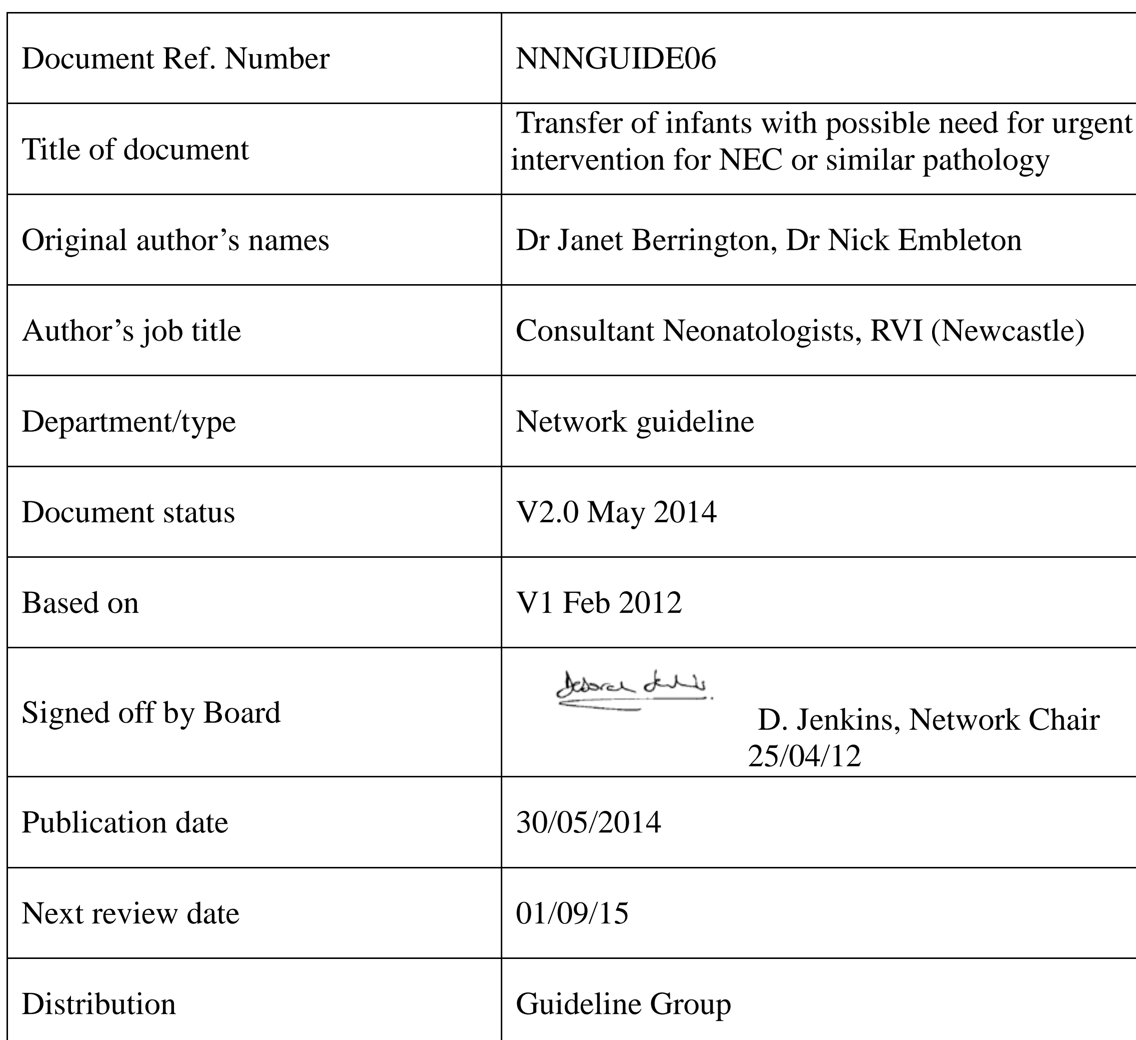
Time of arrival __________________
Time surgeons contacted ___________________
Time anaesthetists contacted _____________________

MONITORING STRATEGY

The standards outlined in this document were audited from April 2012 – March 2013, i.e for 12 months shortly after introduction in February 2012. Several auditable standards have been extracted, which if fulfilled should improve care. These standards and the level achieved in this last audit are given below.

Standard '13-'14 audit (n=13)	Number achieving standard (%)	Standard aim
Local senior review including x-ray	8 (61)	100%
Consultant to consultant neonatologist	7 (53)	100%
Timely discussion	8 (61)	100%
Cot availability	13% to Leeds	0% out of region
Quaternary referral form +category	0	100%
Nearest team move baby	10 (77)	100%
Local preparation: 5 standards – BP, Hb, plt, coag,<1hour	BP 9 (70) coag 0 <1hr 2 (15) Hb 2 (15) plt 3 (23)	All 100%
Documentation: notes, letter, x-rays	20-80% depending on unit	100%
RVI preparation: Surgeons Anaesthetists E-record Blood bank requests	Difficult to audit with current documentation Changes to documentation made May 2014 to facilitate	100%
Repeat audit required July 2015 – network board accountable for ensuring undertaken and disseminating findings		

Document Control



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