Surgical Uncomplicated Inguinal Hernia Repair Pre-discharge - Full Clinical Guideline

Reference no.: NIC PP 06/Oct 21/v002

1. Introduction

Preterm babies and sometimes term babies may develop inguinal hernia during their stay on the neonatal unit; it is more common in boys. Early identification enables timely surgical repair before discharge.

The Paediatric Surgeons at Derbyshire Children's Hospital Derby and the Department of Paediatrics, Queens Hospital Burton have joint appointments with Nottingham Teaching Hospital and carry out elective hernia repairs in babies in Nottingham. Derbyshire Children's Hospital have anaesthetists skilled in paediatric and neonatal anaesthesia for paediatric and neonatal surgery in Derby.

2. Aim and Purpose

To provide a surgical pathway for elective inguinal hernia repair in suitable neonates in Derby pre-discharge.

To facilitate safe and timely inguinal hernia repair in the same care episode in UHDB.

This guideline **does not apply** to out-patient or emergency hernia repair or for babies transferred to Nottingham for surgery.

3. Abbreviations

Inguinal hernia: An inguinal hernia occurs where there is a weakness in the muscle around the groin, resulting in the intestine (bowel) bulging through and causing a lump.

QIS: Qualified in Speciality
PDA: Patent Ductus Arteriosus
VSD: ventricular Septal Defect
NBM: Nil By Mouth
NC: Nasal Cannula
CLD: Chronic Lung Disease

4. Criteria for uncomplicated inguinal hernias for pre-discharge repair in Derby

4.1. The baby must be at least 2.0kg

4.2. Haemoglobin at least 100g/dl

4.3. Proposed date of discharge is no more than 48hrs post-surgery date

4.4. Any co-morbidity acceptable to anaesthetist and surgeon to proceed in Derby; babies with CLD should stable and ready for discharge in <0.4l/min of NC oxygen

4.5. The Paediatric Surgeon and anaesthetist have consented parents

5. Referral process for inguinal repair

5.1. Referring babies for inguinal hernia repair in Burton

5.1.1. The baby must be an **inpatient** on the neonatal unit

5.1.2. The attending **paediatric consultant** agrees and requests the visiting **paediatric surgeon from Nottingham** to review

5.1.3. The visiting paediatric surgeon may agree for **pre- or post-discharge** repair.

5.1.4. If pre-discharge, should advise if to be done in **Derby or QMC**

5.1.5. If Derby please liaise with the **Derby Neonatal Service week consultant** for transfer to Derby and follow **guidance 4.2.4 below**.

5.1.6. If transfer is not possible **immediately advice** the paediatric surgeon.

5.2. Referring babies for inguinal hernia repair in Derby

5.2.1. The baby must be **an inpatient** on the neonatal unit

5.2.2. **Promptly inform the neonatal consultant** on service of any inguinal hernia.

5.2.3. The **neonatal** consultant confirms diagnosis and **requests a routine surgical** review from the attending paediatric surgeon on service.

5.2.4. The **paediatric surgeon** will review the baby, confirm the hernia and advise on timing of surgery, usually 2 weeks to allow theatre listing.

5.2.5. The **paediatric surgeon informs the anaesthetist** for the paediatric list.

6. Process after a baby is accepted for surgery

6.1. The Paediatric surgeon will inform the appropriate paediatric anaesthetist

6.2. The neonatal nurse starts the Paediatric Surgical, Emergency Trauma and Orthopaedic Admissions Pathway and included patient's medical record

6.3. The paediatric surgeon will obtain consent of the parents/legal guardian

6.4. Check U&E and FBC at least 24hrs of proposed surgery date

6.5. If in oxygen, do blood gas, at least 12hrs before the proposed surgery date

6.6. Check transport system and replace air and oxygen cylinders if necessary

7. **Pre-departure checks:**
   - **7.1. Confirm** that the baby is well and ready for discharge in 48-72hrs. There is no need to check blood sugar routinely and parents should be encouraged to accompany baby to theatre.
   - **7.2.** Request a porter for transporting the baby; to be accompanied by a QIS neonatal nurse to surgery with medical notes, recent gas and drug charts.
   - **7.3.** Move baby to NICU or HDU cot space where the baby will return to after surgery; the space should have facility to ventilate if needed.
   - **7.4.** The clinical team on duty to must confirm that the baby is well fit for surgery, at least 1 hour before leaving the unit.
   - **7.5.** Recheck transport system is ready, including trans warmer to maintain temperature on return from theatre, saturation monitor, suction and ventilation circuit
   - **7.6.** The anaesthetist will usually consent parents on the morning of the surgery
   - **7.7.** Take along the Paediatric surgical pathway documentation with consent documents.
   - **7.8.** Ensure secure venous access
   - **7.9. Feeding and hydration**
     - **7.9.1.** If baby on breast milk make nil by mouth for 4 hours
     - **7.9.2.** If baby formula fed, make nil by mouth for 6hours
     - **7.9.3.** NBM to all medications 4hrs pre-op
     - **7.9.4.** No feeding tube is required except if the baby already has one
     - **7.9.5.** Maintain 5% glucose at 120mls/kg/day once nil by mouth but discontinue before leaving for theatre
   - **7.10.** Perform a full set of observations within 1 hour of expected time of surgery: Temperature, heart rate, respiratory rate and blood pressure
   - **7.11.** Put baby in transport incubator in nappy with 2 identity bands. Take spare clean nappy in case soiled when theatre staff remove for surgery
   - **7.12.** Leave the neonatal unit extension number with theatre staff to call the unit after surgery and ask for estimated time to pick up baby

8. **In theatre check:**
   - **8.1.** On arrival re-check temperature and hand over to anaesthetist
   - **8.2.** QIS nurse and theatre staff to confirm baby's identity
   - **8.3.** Ask theatre staff to plug transport incubator to maintain charge until return journey
   - **8.4.** Baby is taken in for surgery and returns to recovery room post-surgery
   - **8.5.** Theatre staff to call the neonatal unit and porter when baby is ready to return

8.6. Baby to be accompanied back to unit by QIS nurse with support of a porter and if ventilated with neonatal medical/nurse practitioner.

8.7. Re-check transport incubator before leaving theatre-cylinders, ventilator, monitors and airway management

8.8. Ensure paediatric surgical pathway returns with baby; it should contain clearly any post op care/advice by anaesthetist and paediatric surgeon.

9. On return to the unit:

9.1. Give paracetamol for analgesia for 24hrs post operation

9.2. Monitor baby for apnoeas in the intensive or high dependency care room for 24hrs.

9.3. Restart feeding and gradually built up to pre-surgery regime within 12 hrs. IV fluid may not be required

9.4. Remove cannula 24hrs post operation if no longer required

9.5. Recommence all medications, taking account any missed drugs or delay

9.6. The paediatric surgeon will review baby post op before discharge and agree surgical follow up date, usually in 2-3months

9.7. On discharge parents can remove all dressings day 3 post op

DO not proceed to surgery if:

1.1. **The Baby is unwell or suspected of sepsis**

1.2. No intensive care or HDU cot

10. Appendix

A: neonatal check list

B: Audit standard

11. References

Paediatric Surgical, Emergency Trauma and Orthopaedic Admissions Pathway

12. Documentation Controls

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Appendix A

Neonatal Unit's Check list before leaving the unit:		Yes	No
1.	Check baby's ID is correct with 2 identity tags		
2.	Has the surgeon marked site for surgery and consent obtained		
3.	Has parents/legal guardian consented		
4.	Has the baby been seen by a clinician within the hour		
5.	Are the baby's observation taken within the hour normal		
6.	Is there a functional cannula		
7.	Have parents/legal guardian been informed of departure to theatre		
8.	Are you happy the transport incubator is okay to use		
9.	Before departure to theatre have you discontinued IV fluids		
10.	Do you have the surgical pathway documentation with baby		
If ALL YES, proceed to theatre			
If ANY NO, stop, sort and recheck			
Checked by Signature:			
Date			
Time			

Appendix B

As this is a new pathway it is important for good governance that we audit our practice regularly. The initial audit should be 1 year after the first case and future re-audits will be as agreed at each audit presentation.

Below is a pre-determined audit standard; this may be amended in future after completing an audit cycle.

Audit standard

1. 100% of these babies must be at least 2.0 kg on the day of surgery
2. 100% of these babies should have a recent haemoglobin level of at least 100g/dl
3. 100% of babies on this pathway have uncomplicated inguinal hernia
4. 100% of babies should be consented
    a. By surgeon prior to surgery
    b. By Anaesthetist prior to theatre
    c. By a parent/legal guardian prior to surgery
5. 0% of these babies have a complex or cyanotic heart disease
6. 100% of babies on this pathway should be discharged home within 72hrs of the operation day
7. How many babies had apnoeas in the 24hrs post-surgery?
8. How many babies failed to return to normal feeding regime within 24hrs of surgery?
9. How many babies were
    a. in oxygen beyond 24hrs post operation
    b. if Chronic Lung disease were not back to their pre-operation oxygen requirement
10. 100% of babies should have a signed, timed and dated Neonatal unit check list before surgery