



GUIDELINE

Inguinal Hernia: Non-Strangulated and Strangulated

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

Aim

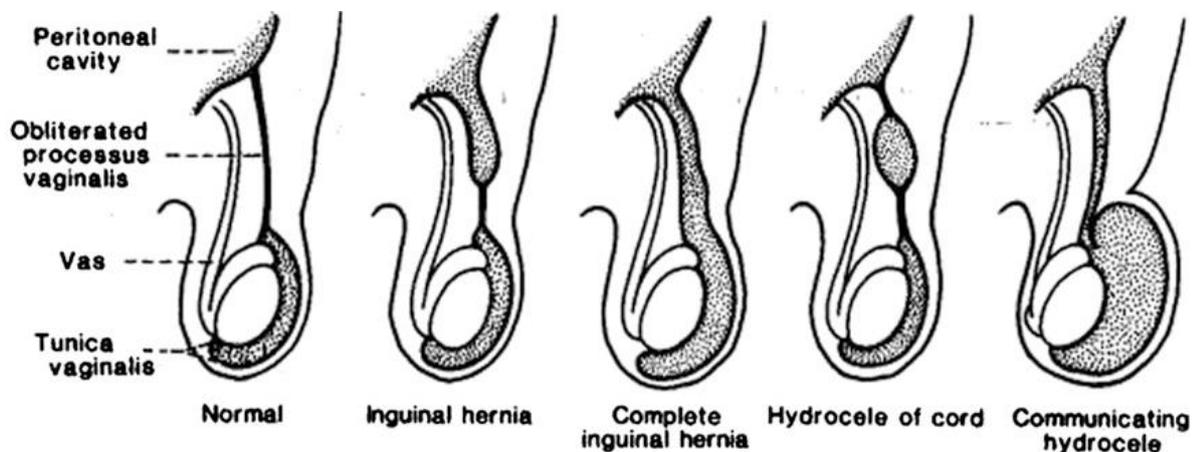
To ensure a standardised approach to the management of inguinal hernia

Risk

Delayed detection and/or management of inguinal hernia may lead to undetected strangulation and the need for emergency surgery.

Background

During fetal life the testes develop in the abdomen and gradually descend through the “inguinal canal” into the scrotum, taking with them a pouch of peritoneum. If this pouch persists the intestine can descend into the canal or scrotum creating an inguinal hernia. If fluid only passes through the canal a hydrocele develops.



The incidence of inguinal hernia increases as the gestational age decreases. For example, a male infant born at 24 weeks gestational age has 40% risk of developing inguinal hernia, the incidence is <4% for those born after 32 weeks gestational age. More common in males (only 12% of cases are in females). Male preponderance exists because the inguinal canal remains open longer in boys to allow the final descent of the testes between 25 and 30 weeks of gestation. Compared with girls, male infants have a 3- to 5-fold higher incidence of inguinal hernias.

Hernias can be transient therefore clear documentation at time of examination is required to assist with Surgical review.

Hernias require repair as they can become trapped in the inguinal canal, incarceration can result in loss of blood supply to the intestines, testicles or ovary. An Incarcerated Hernia is a surgical emergency.

Non-Strangulated (Non-Obstructed) Inguinal Hernia

- Presents as a painless swelling in the inguinal region (can extend to scrotum in males, or to labia in females) secondary to persistence of a wide processus vaginalis, with herniation of bowel (or, in females, the ovary).
- In boys 60% are on the right, 25% on the left and 15% of cases are bilateral. The swelling is reducible.
- More common in premature infants and in infants with raised intra-abdominal pressure.
- May feel an impulse on crying straining or coughing. It is often difficult to define the upper margin of the swelling. The lump may transilluminate.

Differential Diagnosis

Encysted hydrocele of the cord, the undescended or retractile testis, testicular torsion, testicular tumour, incarcerated ovary, epididymitis and orchitis.

Management

- Confirmation of inguinal hernias by the Senior Registrar/consultant. Arrange for a clinical photograph to document the inguinal hernia.
- For the asymptomatic infant with a confirmed reducible hernia, complete the non-obstructed inguinal hernia [referral form](#) as soon as hernia confirmed and email to PCH.PaediatricSurgeryWaitlist@health.wa.gov.au to enable the surgical team to see the infant in the pre-op clinic for assessment and obtain informed consent.
- During the **Weekly Physical Exam**, check and document on the Neonatal Summary Flow Chart MR485.02 the presence or absence of the inguinal hernia to ensure there are no complications such as obstruction or strangulation where urgent action and referral needs to be undertaken. (For management of a [strangulated hernia](#) see below)
- The timing of inguinal hernia repair should be discussed with the on-call surgical team in PCH.
 - Infants living in the metropolitan area may be discharged home after surgical consultation and booked for an elective repair within 30 days (category 1).

The Paediatric Surgery waitlist team will liaise with the family regarding arrangements and send a booking letter for surgery.

- Infants living in regional areas generally have inguinal hernia surgery before discharge home.
- Infants considered high-risk with concerns for follow-up have inguinal hernia surgery before discharge home.
- If the infant is for surgery prior to discharge, it should ideally be scheduled when the infant is off respiratory support or on low flow oxygen (if going home on low flow oxygen). The surgery date is coordinated between the KEMH discharge coordinator and Paediatric Surgical CNS. Once the date is confirmed, the transfer to PCH should be discussed with the PCH NICU and the NETSWA team.
- Give the parents an [information sheet](#) explaining actions required if re-herniation occurs if their infant is being discharged prior to repair, or their infant had a hernia's detected once and then not detected again.

Strangulated or Obstructed Inguinal Hernia

- The incidence of strangulation in preterm infants is reported between 14% and 31%. Some reports have observed a lower incidence in preterm infants compared with term infants.
- Strangulation occurs when the fascial tissue at the internal or external inguinal ring obstructs the venous return, followed by increasing oedema and pressure in the hernial sac causing the arterial supply to be compromised. This leads to a loss of blood supply to the herniated bowel or infarction of the ovary or testis that may be present in the hernial sac. Repeated episodes of irreducibility of the hernia may also cause intermittent loss of blood supply to the testis and result in later testicular atrophy. Infants who have fussy periods can increase their abdominal pressure and force abdominal contents to protrude through the hernial defect and cause strangulation. A history of hernia strangulation and prematurity are the 2 main risk factors for testicular atrophy later in life.

Clinical presentation of an infant with strangulated hernia

- Inconsolable crying and a tense, tender not reducible lump in the inguinal region. There may be vomiting and abdominal distension.
- The senior clinician must immediately attempt to reduce the hernial contents into the abdomen. [Figure 1](#) illustrates a method commonly used to reduce an incarcerated inguinal hernia. If the bowel is completely ischaemic, manual reduction will be unsuccessful and immediate surgical intervention is warranted.
- The infant may deteriorate so careful monitoring and prompt intervention is necessary. Approximately 80% to 95% of obstructed hernias can be reduced to allow for a delay in surgery by 24 to 48 hours.

Figure 1: Technique of reduction of hernia in a neonate.

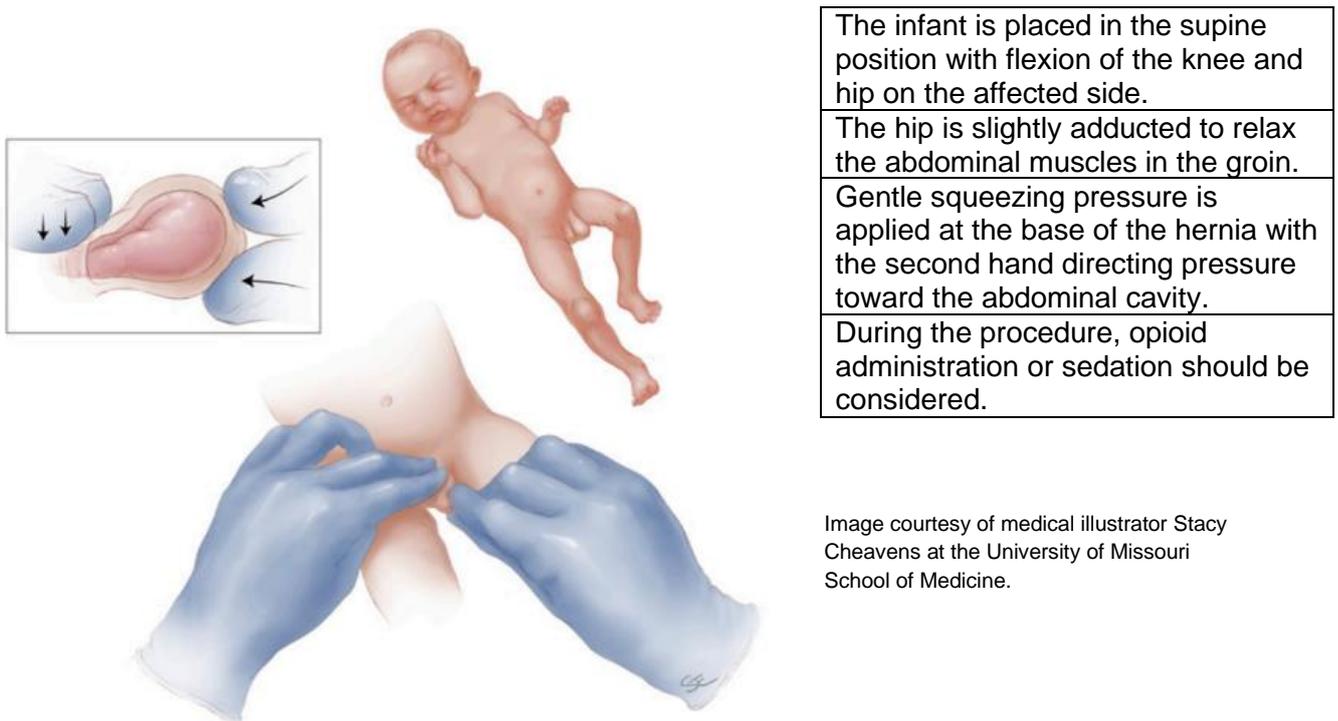


Image courtesy of medical illustrator Stacy Cheavens at the University of Missouri School of Medicine.

- Notify senior neonatal medical staff and parents.
- Consult the on call PCH Paediatric Surgical team urgently.
- Stop feeds, Insert IV, take FBC, CRP, blood culture, blood gas, blood group and hold. Consider abdominal x-rays.
- Start IV fluids (may need fluid boluses). Start IV antibiotics (Tazocin).
- Pain assessment and management.
- Insert NGT onto straight drainage.
- Liaise with NETS WA regarding transport and admission to 3B if infant at KEMH
- Liaise with CNC 3B if parent accommodation is needed.
- Routine [Pre-Operative Care](#).

Post-Operative Care

Follow routine [Post-Operative Care](#) on return from theatre including a blood gas, thereafter as per medical orders.

Post-operative Complications include hernia recurrence (higher in preterm infants, 2%–10%), postoperative hydrocele (1-7%), wound infection (0.5-2.7%), iatrogenic cryptorchidism (1-3%), testicular atrophy and injury to the vas deferens.

Wound Care

- Hourly observation of wound site for bleeding, swelling and redness for a minimum of 4 hours. Then 4 hourly if no bleeding, swelling, redness detected.

- The wound site will usually be covered with steri-strips. These should be kept dry for 3 to 5 days.
- If it becomes soiled within the first 5 days the area should be gently cleaned and dried.
- The infant can have a bath after 5 days.
- The steri-strips will curl up and fall off. Do not pull them off.

Pain Relief

Monitor pain scores and administer pain relief if indicated (generally Paracetamol as ordered). Refer to [Pain Assessment and Management Guideline](#).

Feeding

- Infants can start oral feeds when awake post anaesthetic if respiratory status is stable.
- Maintain an accurate record of input and output.

Related CAHS internal policies, procedures and guidelines

Neonatology guideline

- [Pain Assessment and Management Guideline](#)
- [Post-Operative Care](#)

[Pre-Operative Care](#).

References and related external legislation, policies, and guidelines

1. Peevy KJ, Speed FA, Hoff CJ. Epidemiology of inguinal hernia in preterm neonates. *Pediatrics*. 1986;77(2):246–247
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Useful resources (including related forms)

- [Referral Form](#)
- [Parent Information Sheet](#)

This document can be made available in alternative formats on request.

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