



GUIDELINE

Necrotising Enterocolitis

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](#)

Contents

Aim	1
Background.....	1
Epidemiology	2
Physiology / Pathophysiology.....	3
Clinical Presentation	3
Investigations.....	3
Management of Confirmed NEC	4
Prognosis.....	4

Aim

To provide guidance for the diagnosis and management of Necrotising Enterocolitis (NEC) in infants.

Background

Necrotising Enterocolitis (NEC) is an inflammatory condition of the gut characterised by gastro-intestinal and systemic signs and symptoms including feed intolerance, abdominal distension and tenderness, occult or gross blood and mucus per rectum, lethargy, temperature instability, apnoea and poor peripheral perfusion.

Use of breast milk, pasteurized human donor milk, standardised feeding regimens and probiotic supplementation have been shown to minimise the risk of NEC in preterm infants. Observational studies have suggested that packed red cell transfusion may increase the risk of NEC.

The following clinical stages are recognised (Dominguez et al 2012):

Stage	Systemic Features	Abdominal Features	Radiological Features
1a: Suspected NEC	Temperature instability, apnoea, bradycardia	Increased gastric residuals, mild abdominal distension, occult blood in stool	Normal or intestinal dilatation, mild ileus
1b: Suspected NEC	Same as above	Grossly bloody stool	Same as above
2a: Definite NEC; Mildly III	Same as above	Same as stage 1 plus lack of bowel sounds, possible abdominal tenderness	Ileus, Pneumatosis intestinalis
2b: Definite NEC; Moderately III	Same as Stage 1 plus mild metabolic acidosis, mild thrombocytopenia	Same as above plus peritonitis, definite abdominal tenderness, possible cellulitis, right lower quadrant mass	Same as above plus possible portal venous gas
3a: Advanced NEC; Severely III, Intact Bowel	Same as Stage 2b plus hypotension, severe apnoea, combined respiratory and metabolic acidosis, disseminated intravascular coagulation, and neutropenia	Same as above with marked tenderness and abdominal distension	Same as above plus ascites
3b: Advanced NEC; Severely III, Perforated Bowel	Same as Stage 3a	Same as Stage 3a	Pneumoperitoneum

Epidemiology

Predominantly a disease of prematurity but can occur in full term infants also. NEC incidence: 6-10% in infants < 1.5 kg.

Term infants: NEC is often secondary to a major predisposing event like sepsis, fetal growth restriction, perinatal hypoxia, and/or associated with underlying congenital heart disease.

Physiology / Pathophysiology

Thought to result from a complex interaction of initially a mucosal injury (ischaemia, infections, intraluminal hyperosmolar solutions) and the host response to that injury (circulatory, immunologic, inflammatory). The commonest sites involved are the terminal ileum and ascending colon.

Clinical Presentation

Time of onset is usually in the first two weeks of life. Suspect NEC in any immature or acutely unwell infant with:

- Feed intolerance, abdominal distension, bile stained aspirates.
- Acidosis, thrombocytopenia.
- Abdominal tenderness, abdominal mass.
- Blood or mucus per rectum.

Differential diagnosis to be considered:

- Sepsis with ileus.
- Bowel obstruction.
- Volvulus.
- Malrotation
- Spontaneous intestinal perforation: This is a distinct clinical entity in the Very Low Birth Weight (VLBW) infant, differentiated from NEC surgically by isolated perforation often at the terminal ileum with normal bowel. Abdominal x-ray has no evidence of pneumatosis intestinalis. To be considered if Indomethacin and/or steroids have been given and the clinical picture is suggestive of NEC.
- Systemic Candidiasis

Investigations

- Abdominal x-ray supine and left lateral decubitus (Gas in bowel wall, peritoneal fluid, thickened bowel wall, intrahepatic gas, free intraperitoneal gas).
- Abdominal ultrasound including Doppler studies (discuss with radiologist). It can show signs of intestinal peristalsis, intestinal wall blood flow/ perfusion, intestinal wall gas, abdominal effusion and free gas. Some recent studies suggest that it is more sensitive than x-ray examination in judging intestinal necrosis and intestinal perforation.
- Septic screen, FBC, coagulation studies, U&Es, blood gas.

Management of Confirmed NEC

Prevent progression of the disease and treat symptoms.

- Stop feeds – nil orally to allow the Gastrointestinal Tract (GIT) to rest.
- Surgical consult.
- Intra-gastric tube to free drainage - minimum size 6, may need an 8FG.
- Monitor vital signs, blood pressure, peripheral circulation and fluid balance (urine output).
- Antibiotics - cover gram positive, negative organisms and anaerobic organisms (usually Vancomycin, Gentamicin and Metronidazole).
- Consider removing umbilical catheters if in situ.
- Intubation and mechanical ventilation if the baby is haemodynamically unstable or having frequent apnoea/bradycardia or severe acidosis.
- Correction of coagulopathy and/or thrombocytopenia.
- Commence pain scoring.
- Morphine for pain relief if definite NEC.
- Parenteral nutrition - consider need for central line if there is a need for ongoing IV nutrition for greater than 5-7 days. Review daily on the ward round and document the decision in the progress notes.
- Regular abdominal x-rays looking for pneumoperitoneum; frequency depends on severity.

Prognosis

NEC can lead to significant short term as well as long term morbidities. The short-term morbidities are sepsis, prolonged TPN, stoma problems, intestinal strictures, fistula etc.

Occasionally an infant can develop short bowel syndrome because of resection of extensive sections of the gut. NEC also carries a high risk of long-term neurodevelopmental morbidity. Surgical NEC results in higher rate of mortality and long-term neurodevelopmental morbidity.

Related CAHS internal policies, procedures and guidelines

[Transfer of Preterm Infants with Intestinal Perforation/Necrotising Enterocolitis to Ward 3B PCH](#)

References and related external legislation, policies, and guidelines

1. Kathleen M. Dominguez, and R. Lawrence Moss. Necrotizing Enterocolitis. Clinics in Perinatology, 2012-06-01, Volume 39, Issue 2, Pages 387-401
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