



**CLINICAL PRACTICE GUIDELINE**

Guideline coverage includes NICU KEMH, NICU PCH and NETS WA

**Necrotising Enterocolitis (NEC)**

This document should be read in conjunction with the [Disclaimer](#)

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                         |
|---|--|---|---|
| <b>1a: Suspected NEC</b>                                | Temperature instability, apnoea, bradycardia   | Increased gastric residuals, mild abdominal distension, occult blood in stool                                 | Normal or intestinal dilatation, mild ileus   |
| <b>1b: Suspected NEC</b>                                | Same as above  | Grossly bloody stool  | Same as above                                 |
| <b>2a: Definite NEC; Mildly III</b>                     | Same as above  | Same as stage 1 plus lack of bowel sounds, possible abdominal tenderness                                      | Ileus, Pneumatosis intestinalis               |
| <b>2b: Definite NEC; Moderately III</b>                 | 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 |
| <b>3a: Advanced NEC; Severely III, Intact Bowel</b>     | 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                    |
| <b>3b: Advanced NEC; Severely III, Perforated Bowel</b> | 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.

## 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.

## 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).
- 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 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.
- Commence pain scoring.
- Morphine for pain relief if definite NEC.
- Parenteral nutrition - consider need for central line.
- 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.

## References

1. Kathleen M. Dominguez, and R. Lawrence Moss. Necrotizing Enterocolitis. Clinics in Perinatology, 2012-06-01, Volume 39, Issue 2, Pages 387-401
2. Gayatri Athalye-Jape, Kiran More, Sanjay Patole. Progress in the field of necrotising enterocolitis-year 2012. J Matern Fetal Neonatal Med. 2013 May;26(7):625-32
3. Girish Deshpande, Shripada Rao, Sanjay Patole, Max Bulsara. Updated meta-analysis of probiotics for preventing necrotizing enterocolitis in preterm neonates. Pediatrics. 2010 May;125(5):921-30.
4. Kastenber ZJ, Sylvester KG. The surgical management of necrotizing enterocolitis. Clin Perinatol. 2013 Mar;40(1):135-48

## Related WNHS policies, procedures and guidelines

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

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