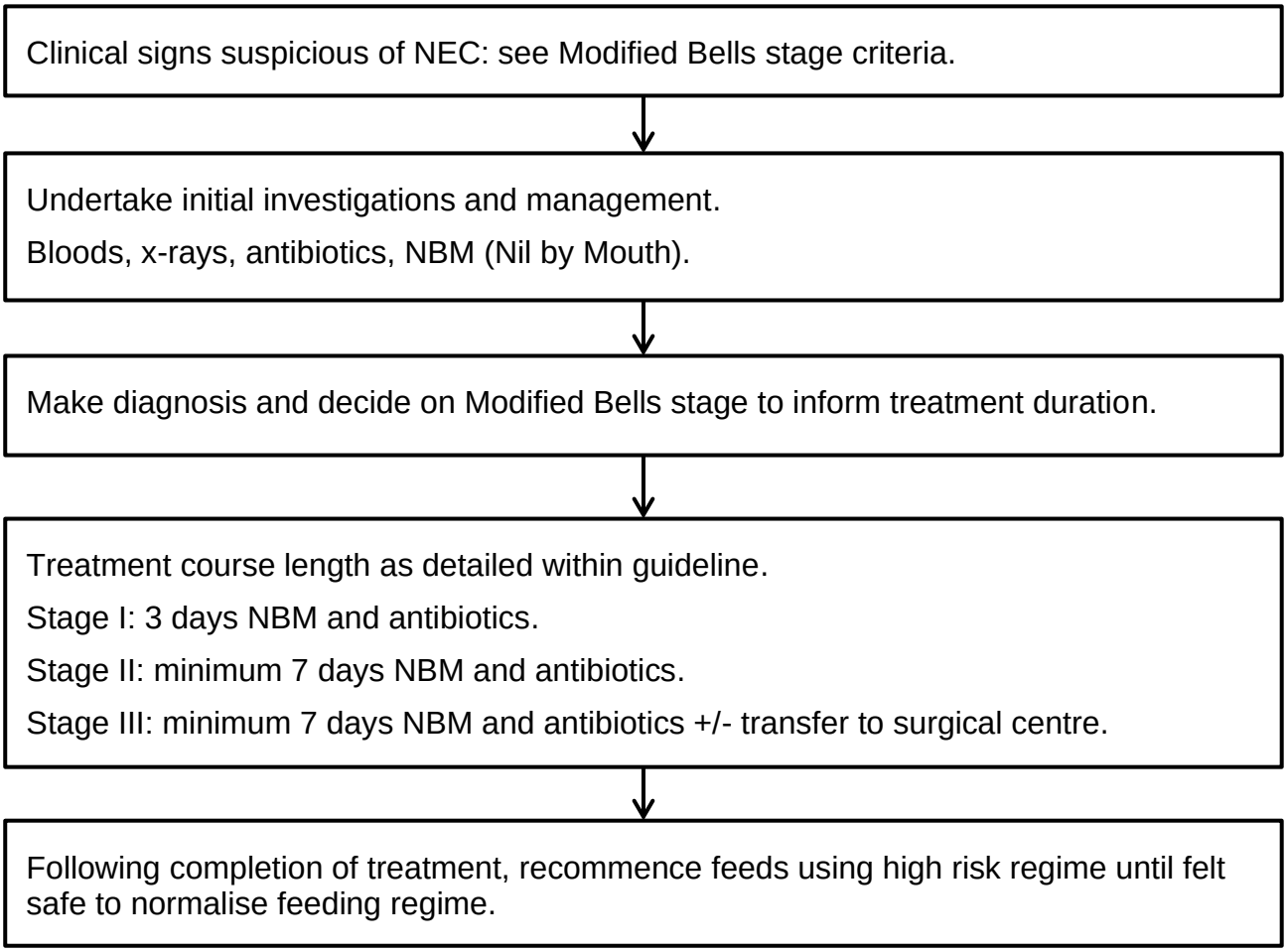
Royal Cornwall Hospitals
NHS Trust

Necrotising Enterocolitis (NEC) Clinical Guideline

V2.0

October 2024

Summary


Clinical signs suspicious of NEC: see Modified Bells stage criteria.
Undertake initial investigations and management.
Bloods, x-rays, antibiotics, NBM (Nil by Mouth).
Make diagnosis and decide on Modified Bells stage to inform treatment duration.
Treatment course length as detailed within guideline.
Stage I: 3 days NBM and antibiotics.
Stage II: minimum 7 days NBM and antibiotics.
Stage III: minimum 7 days NBM and antibiotics +/- transfer to surgical centre.
Following completion of treatment, recommence feeds using high risk regime until felt safe to normalise feeding regime.

1. Aim/ Purpose of this Guideline

1.1. This guideline applies to infants on the neonatal unit at Royal Cornwall Hospital with the aim of standardising management of NEC.

1.2. This version supersedes any previous versions of this document.

Data Protection Act 2018 (UK General Data Protection Regulation – GDPR) Legislation.

The Trust has a duty under the Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed, and documented. We cannot rely on opt out, it must be opt in.

Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 please see the Information Use Framework Policy or contact the Information Governance Team.

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2. The Guidance

2.1. Introduction

Although the exact underlying cause is unknown, it is felt that a combination of hypoperfusion affecting immature gut combined with a challenge to the gut during establishment of feeds may lead to the cascade of gut inflammation that occurs in NEC. Although the incidence of NEC has reduced due to improved provision of antenatal steroids, reduced use of formula milk, routine use of probiotics in high-risk groups and optimal cord management, NEC remains an illness with a high morbidity and mortality and index of suspicion should be high and investigation and treatment should be instituted promptly if suspected.

2.2. Risk Factors

- Prematurity.
- Abnormal umbilical dopplers and intrauterine growth restriction.
- Formula feeding in preterm infants.
- Congenital heart disease.
- Perinatal asphyxia.
- Polycythaemia.

2.3. **Diagnosis (Modified Bells Staging for NEC)**

Stage	Systemic Signs	Abdominal Signs	Radiologic Signs
I. Suspected			
A	Temperature instability, apnoea, bradycardia, lethargy	Increased gastric residuals, abdominal distension, occult blood in stool	Normal or mild intestinal dilation, mild ileus
B	As above	Grossly bloody stool	As above
II. Definite			
A. Mildly ill	As above	As above plus absent bowel sounds with or without abdominal tenderness	Intestinal dilation, ileus, pneumatosis intestinalis
B. Moderately ill	As above plus mild metabolic acidosis and thrombocytopaenia	As above plus definite abdominal tenderness, with or without abdominal cellulitis or right lower quadrant mass	As above plus ascites
III. Advanced			
A. Severely ill, intact bowel	As above plus hypotension, bradycardia, severe apnoea, respiratory and metabolic acidosis, DIC (Disseminated Intravascular Coagulation) and neutropaenia	As above, plus peritonitis, marked tenderness	As above
B. Severely ill, perforated bowel	As above	As above	As above plus pneumoperitoneum

2.4. **Differentials**

- Consider central line extravasation. If felt to be likely: stop using line, review previous x-rays, and consider further imaging with x-ray and/ or ultrasound.
- Feed intolerance is common in preterm infants, do not use the presence of increased gastric residuals or bile-stained aspirates alone as a reason to stop feeds. In a baby over 36 weeks with bile-stained aspirate or vomiting, please refer to the Bristol Guideline: Bilious Vomiting- Management of Neonates, which is accessible via NHS Futures website.
- Colitis related to cow's milk protein allergy.
- Milk curd obstruction (rare) in those of breast milk fortifier.
- Strictures related to previous NEC or surgery.

2.5. **Initial Investigations if Clinical Suspicion of NEC**

- Abdominal x-ray PA (Posterior- Anterior).
- Left lateral decubitus x-ray to assess for perforation if clinically suspected.
- Baseline bloods (FBC (Full Blood Count), electrolytes, liver, bone, CRP (C-reactive protein)).
- Blood culture.
- Consider ultrasound abdomen.

2.6. **Management**

- Manage A, B, C as normal.
- Stop feeds.
- Naso Gastric (NG) tube on free drainage.
- Start amoxicillin, gentamicin and metronidazole intravenously.
- Start Total Parenteral Nutrition (TPN) via a central line.
- Be aware that ill babies with NEC may require more fluid boluses than expected due to fluid shift within the abdominal cavity and porous bowel.
- Distended abdomen may have negative on respiration, anticipate the need for ventilation with high pressures.
- In sick babies with NEC or those that deteriorate repeat x-rays at least every 24 hours to look for evidence of perforation.
- Discuss sick babies with NEC with the Derriford Team.
- Refer to surgical centre urgently:

- If evidence of perforation.
- Failure of medical management (no improvement despite treatment).
- Fixed loops of bowel on imaging.

2.7. **Treatment Duration**

- Bells stage I (A or B)- stop feeds and give antibiotics for 3 days, then review and if reassuring, stop antibiotics and restart feeds using high risk feeding regime initially.
- Bells stage II (A or B)- stop feeds and give antibiotics for 7 days minimum and discuss with Derriford team regarding course length.
- Bells stage III A- stop feeds and give antibiotics for minimum 7 days, discuss with Derriford, low threshold for transfer to tertiary unit.
- Bells stage III B- as above and arrange urgent transfer to Surgical Unit.

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	Compliance with policy/ key changes to practice.
Lead	Neonatal Guidelines Lead.
Tool	Adherence to guidelines will be monitored as part of the ongoing audit process on a Word or Excel template.
Frequency	As dictated by audit findings.
Reporting arrangements	Neonatal Audit and Guidelines Meeting.
Acting on recommendations and Lead(s)	Ward Managers/ Matron/ Consultants/ Clinical Director's etc.
Change in practice and lessons to be shared	Required changes to practice will be identified and actioned within 3 months, immediately if required. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant staff/ stakeholders.

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the Equality Diversity And Inclusion Policy or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Necrotising Enterocolitis (NEC) Clinical Guideline V2.0
This document replaces (exact title of previous version):	Necrotising Enterocolitis (NEC) Clinical Guideline V1.0
Date Issued/Approved:	October 2024
Date Valid From:	October 2024
Date Valid To:	October 2027
Directorate / Department responsible (author/owner):	Dr. Chris Warren; Paediatric Consultant with interest in Neonatology
Contact details:	01872 252667
Brief summary of contents:	Management of NEC
Suggested Keywords:	NEC, necrotising enterocolitis, neonate.
Target Audience:	**RCHT:** Yes **CFT:** No **CIOS ICB:** No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Neonatal Audit and Guidelines group
Manager confirming approval processes:	Caroline Chappell
Name of Governance Lead confirming consultation and ratification:	Tamara Thirlby
Links to key external standards:	None required
Related Documents:	None required
Training Need Identified?	No
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet

Information Category	Detailed Information
Document Library Folder/Sub Folder:	Clinical/ Neonatal

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
March 2021	V1.0	Initial issue.	Chris Warren; Consultant Paediatrician with interest in Neonatology
October 2024	V2.0	Full review, no amendment to guidance required. Update to new Trust formatting.	Chris Warren; Consultant Paediatrician with interest in Neonatology

All or part of this document can be released under the Freedom of Information Act 2000.

All Policies, Strategies and Operating Procedures, including Business Plans, are to be kept for the lifetime of the organisation plus 6 years.

This document is only valid on the day of printing.

Controlled Document.

This document has been created following the Royal Cornwall Hospitals NHS Trust The Policy on Policies (Development and Management of Knowledge Procedural and Web Documents Policy). It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity, and Inclusion Team rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Necrotising Enterocolitis (NEC) Clinical Guideline V2.0
Directorate and service area:	Neonatal
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Neonatal Audit and Guidelines Group
Contact details:	01872 252667

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	Infants of the neonatal unit.
2. Policy Objectives	Manage NEC in neonates.
3. Policy Intended Outcomes	To improve the well-being of patients by offering the appropriate management of patients.
4. How will you measure each outcome?	Audit/ multidisciplinary team weekly discussion/ incidents/ risk management.
5. Who is intended to benefit from the policy?	Neonatal patients.

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	• Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	**Please record specific names of individuals/ groups:** Neonatal Audit and Guidelines Group.
6c. What was the outcome of the consultation?	Approved.
6d. Have you used any of the following to assist your assessment?	**National or local statistics, audits, activity reports, process maps, complaints, staff, or patient surveys:** No.

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	Any information provided should be in an accessible format for the parent/ carer/ patient's needs- i.e., available in different languages if required/ access to an interpreter if required.

Protected Characteristic	(Yes or No)	Rationale
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	Those parent/ carer/ patients with any identified additional needs will be referred for additional support as appropriate- i.e., to the Liaison Team or for specialised equipment. Written information will be provided in a format to meet the family's needs e.g., easy read, audio etc.
Religion or belief	No	All staff should be aware of any beliefs that may impact on the decision to treat and should respond accordingly.
Marriage and civil partnership	No	
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Neonatal Audit and Guidelines Group.

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis