



HSE

National Policy National Procedure National Protocol National Guideline
 National Clinical Guideline

GASTROSCHISIS: MANAGEMENT PRIOR TO TRANSFER TO SURGICAL CENTRE

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Short summary:

The Clinical Guideline aim to provide standardised care of babies with gastroschisis between perinatal centres and surgical centres.

Description:

This Guideline provides guidance on the following :

1. Management of the exteriorised abdominal contents
2. Approach to fluid management during stabilisation
3. Approach to fluid management in the on-going preoperative phase prior to arrival at surgical centre

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NATIONAL CLINICAL GUIDELINE

TITLE:

Clinical Design and Innovation Health Service
Executive

GASTROSCHISIS: MANAGEMENT PRIOR TO TRANSFER TO SURGICAL CENTRE

| | | | |
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| Developed by: | Dr Margaret Moran, Prof Alan Mortell @ CHI, NCP Paediatrics and Neonatology, HSE and the Neonatal Clinical Advisory Group, RCPI | Publication date V0 : | September 2020 |
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Introduction

Gastroschisis is characterised by the herniation of bowel and other abdominal contents through an abdominal wall defect usually located just to the right of the umbilicus. The normal insertion of the umbilical cord into the abdominal wall distinguishes gastroschisis from exomphalos, the other common abdominal wall defect where abdominal contents herniate through the umbilicus and are contained within the umbilical cord.

The incidence varies worldwide but there has been a global increase in incidence since the 1960s from 0.06-0.08/10,000 to 4.5-5.1/10,000. In the last decade in some countries there has been a decrease in numbers. In Ireland we see on average 5 – 15 each year. In 2022 and 2023, 14 babies were admitted to Children’s Health Ireland (CHI) with gastroschisis. Survival rates are over 90% among live born infants and the outcome is primarily determined by the amount of bowel damage in utero.

As there is no covering sac the exposed bowel is often oedematous and matted due to exposure to amniotic fluid. In contrast to exomphalos, gastroschisis is rarely associated with aneuploidy or other major non-GI abnormalities.

Gastroschisis can be divided into two categories, simple and complex based on associated intestinal pathologies. Complex gastroschisis (10 – 15% of cases) is associated with other intestinal pathologies including intestinal atresia, bowel perforation, necrotic segments of bowel or volvulus. Rates of complications are significantly higher in this group.

Aim of Guideline

Standardised care of babies with gastroschisis between perinatal centres and surgical centres. In particular:

- Management of the exteriorised abdominal contents.
- Approach to fluid management during stabilisation
- Approach to fluid management in the on-going preoperative phase prior to arrival at surgical centre

Purpose and Scope

- The purpose of this guideline is to improve the management of babies with a diagnosis of gastroschisis.
- These guidelines are intended for healthcare professionals, particularly those in training, who are working in HSE-funded paediatric and neonatal services
- They are designed to guide clinical judgement but not replace it. In individual cases a healthcare professional may, after careful consideration, decide not to follow a guideline if it is deemed to be in the best interests of the child or neonate

Glossary of Terms and Definitions

| | |
|-------|---|
| CHI | Children's Health Ireland |
| CPAP | Continuous positive airway pressure |
| FBC | Full blood count |
| HSE | Health Service Executive |
| IV | Intravenous |
| Kg | Kilogram |
| NCPPN | National Clinical Programme for Paediatrics and Neonatology |
| NG | Nasogastric |
| NICU | Neonatal Intensive Care Unit |
| NRP | Neonatal Resuscitation Program |
| NWIHP | National Women and Infant's Health Programme |
| OG | Orogastric |
| PICU | Paediatric Intensive Care Unit |

Roles and Responsibilities

This guideline should be reviewed by each acute hospital senior management team to appropriately plan implementation. This guideline aims to facilitate best practice and standardise the care provided to babies in Ireland to ensure that the inpatient care of babies admitted to their facility is optimised irrespective of location.

Clinical Guideline

Management

Prenatal Management

- More than 90% of cases are prenatally diagnosed and are therefore managed at the Rotunda Hospital, the Coombe Hospital and the National Maternity Hospital
- Planned delivery in one of the above Dublin hospitals is always recommended but sometimes emergent delivery is required in local centres
- Parents receive antenatal counselling from fetal maternal medicine departments and subsequently are generally well prepared
- A normal vaginal birth is the aim in otherwise uncomplicated pregnancies
- There is a significant incidence of late preterm birth. Most of these are related to induction or semi-elective caesarean section for concern about fetal well-being and the well-being of the exposed bowel
- Median gestation in Ireland is 36.5 weeks, with a mean birth weight of 2.48kg
- Some babies require respiratory support reflecting the effect of one or more of prematurity, growth restriction, aspiration of gastric contents or perinatal asphyxia

FOR ELECTIVE OR SEMI-ELECTIVE BIRTHS THE PERINATAL TEAM SHOULD LIAISE WITH THE IRISH PAEDIATRIC CRITICAL CARE NETWORK (1800222378) THE NATIONAL NEONATAL TRANSPORT SERVICE (1800222378) ON THE DAY OF ANTICIPATED BIRTH. ONCE A REFERRAL IS ACCEPTED AT A SURGICAL ADMISSION SITE THE NEONATAL CONSULTANT AND SURGICAL REGISTRAR AT THE ADMISSION CHI SITE SHOULD BE INFORMED OF THE ANTICIPATED BIRTH **(01 8784200 (TEMPLE STREET)/01 4096100 (CRUMLIN))**

Birth Suite Management

- Prepare as for any anticipated high-risk birth
- Manage airway, breathing and cardiovascular status in accordance with NRP
- In the compromised baby, who requires respiratory support, endotracheal intubation should be undertaken rather than prolonged mask ventilation or nasal CPAP, to minimise gut over-distension
- Once the cardio-respiratory status has been stabilised, quickly inspect the bowel correcting any obvious twists on its pedicle or acute discoloration due to ischaemia
- Position the bowel centrally over the abdomen and wrap in cling film as described below
- Insert a large bore 10Fr orogastric/nasogastric tube and aspirate the stomach
- Ensure adequate thermal control

Postnatal Management

The principles of management during the pre-transfer period address:

1. Care of exteriorised abdominal contents
2. Gastric decompression
3. Fluid resuscitation
4. Avoidance of hypothermia

Management of Exteriorised Abdominal Contents and Gastric Decompression

- Following assessment, the exposed bowel should be wrapped with cling film for protection and to minimize fluid and heat loss; **See Figure 1**
- **Does not need to be sterile-** Slide large piece of cling film under the baby's buttocks and back
- Place exposed organs on baby's abdomen (using sterile latex-free gloves)

- Wrap cling film gently around the abdomen and exposed organs
- **DO NOT** cover bowel with saline soaked gauze, the bowel must be visible through cling film
- Ensure bowel edges are not exposed to drying air
- Avoid compressing the bowel, it should remain mobile but protected
- Monitor the bowel every 15 minutes for dusky or blanching colour changes; remove and rewrap as above if compression, kinking or twisting is suspected

Any concerns regarding bowel colour, position or viability, discuss early with CHI surgical team, and seek senior medical advice

- Support the intestines to prevent occlusion of the blood supply where the bowel exits the defect in the abdominal wall;
 - ✓ Nurse the neonate lying on their right side as defect usually to right of umbilicus,
 - ✓ Support the wrapped bowel perpendicular to the umbilicus using a rolled towel or equivalent
- Ensure gastric decompression by inserting a large bore (10Fr) gastric tube. Leave on free drainage and aspirate frequently to prevent gastric distension, which could cause compression of the small bowel mesentery and subsequent bowel ischaemia
- The bladder may be herniated through the abdominal wall defect. If the bladder becomes distended it may occlude the vascular supply to the extruded bowel. If the bladder is seen outside the abdominal wall and is distended, consider inserting a catheter (NG tube or foley catheter) to keep bladder decompressed. Only pass a catheter if comfortable to do so.

Wrapping of Gastroschisis



Fluid Resuscitation and Fluid Management

- As soon as IV line sited give a 20ml/kg fluid bolus of 0.9% saline (ideally within an hour of birth)
- Monitor infant regularly for evidence of fluid depletion (see below) and replace with additional boluses of 10mls/kg of 0.9% saline
- Signs of fluid depletion include:
 - ✓ Prolonged capillary refill time
 - ✓ Tachycardia
 - ✓ Hypotension
 - ✓ Metabolic acidosis +/- raised lactate
- Monitor central and peripheral capillary refill time every 15 minutes along with heart rate and blood pressure to help guide fluid management
- Maintain an accurate fluid balance record for all infants, including gastric losses. Insensible losses will be unavoidably high, documentation of input/output is paramount
- Commence *maintenance fluid* 10% Dextrose at 80mls/kg/day to maintain plasma glucose ≥ 3 mmol/L. Adjust dextrose concentration as per local policy if < 3 mmol/L.

Thermoregulation

- Thermoregulation is a critical function, which is closely linked to survival of preterm and sick neonates.
- The aim is to maintain a thermoneutral environment with the infant's core temperature between 36.5 and 37.5 °C
- Ensure exteriorised abdominal contents are well wrapped as documented above to reduce heat loss
- Ensure Infants nursed in a pre-warmed incubator or nursed using servo mode if using an open bed with radiant warmer
- Please hat on infants' head to reduce heat loss
- Monitor temperature regularly

General Management in Perinatal NICU

- The objective in all babies is to stabilise and **transfer urgently**. Delay in transfer may compromise the exteriorised bowel.
- Notify the PICU bridge team when the baby is born (do not have to wait until stabilization complete) and the NNTP
- Manage the airway, breathing and any cardiovascular instability as per standard practice. If respiratory support required non-invasive ventilation should be avoided as will cause intestinal distension, which could obstruct blood supply to the extruded bowel. If neonate has a marked respiratory or metabolic acidosis, despite adequate fluid resuscitation, consider intubation.
- Establish vascular access – ideally 2 peripheral IV cannulas (one to give maintenance fluids and one to give fluid boluses/antibiotics etc.). Central venous access will be required. However, it is not essential and transfer **should not** be delayed to site central lines. Central venous access can be obtained at the surgical centre. Arterial access is not required at this stage unless there is significant respiratory or circulatory compromise

- Take blood cultures, FBC and plasma glucose when IV inserted
- Commence intravenous amoxicillin and gentamicin
- Ensure the baby is clinically assessed for other congenital anomalies
- Check a capillary gas to monitor acid-base status and lactate, alternatively a venous blood gas may be collected instead at time of IV insertion if blood flowing freely
- CHI admission site (Temple Street or Crumlin) will be confirmed on referral to PICU bridge. Contact CHI PICU team, CHI Paediatric Surgical Registrar and CHI Neonatal Consultant in the allocated CHI centre to give a medical handover prior to transfer of patient

Transfer to Surgical Centre

If an infant is delivered **outside of Dublin**, unless adequate notice can be given to NNTP to be present for delivery, **the referring hospital should transfer the patient to avoid unnecessary time delays.**

The retrieval team, either NNTP, if available, or team from referring hospital, will:

- Treat the referral as urgent and time sensitive
- Leave the gastroschisis wrapped and undisturbed after ensuring it is well supported and the bowel has remained well perfused
- Continue fluid management regime detailed above

Gastroschisis Flow sheet



Management of Gastroschisis

Contact PICU Bridge and NNTP (1800 222 378),
prior to birth if time allows



Children's Health Ireland
at Temple Street

Resuscitation and ongoing management as per NRP Guidelines
If baby requires respiratory support, intubate

Inspect bowel
Correct obvious twists on pedicle
Slide large piece cling film under baby's buttocks and back
Place exposed organs on baby's abdomen (use sterile latex-free gloves)
Wrap cling film gently around abdomen and exposed organs (photo)
DO NOT COVER BOWEL WITH SALINE SOAKED GAUZE



Insert large bore 10Fr OG/NG tube and aspirate stomach
Leave on free drainage
Aspirate frequently

Insert 2 peripheral IV cannulas
Central access not essential prior to transfer
Take blood cultures, FBC, blood gas, lactate, plasma glucose
Commence antibiotics – Amoxicillin and Gentamicin

Give 20ml/kg bolus of 0.9% NaCl within an hour of birth
Commence *maintenance fluid* 10% Dextrose at 80mls/kg/day; maintain blood glucose ≥ 3 mmol/L
Repeated 10ml/kg boluses of 0.9% NaCl *required* to treat ongoing fluid depletion
Discuss with receiving CHI Surgical and Medical team (Neonates + PICU) (01 8784200/01 4096100)

Monitor Bowel and Fluid status every 15 minutes:
Bowel: If dusky/pale: reposition infant and bowel
If necessary, remove and rewrap
Nurse on right side, wrapped bowel supported perpendicular to umbilicus, using rolled towel or equivalent
Any concerns regarding bowel colour, position or viability, discuss early with CHI surgical team and seek senior medical advice
Fluid: Look for evidence of fluid depletion: prolonged CRT, tachycardia, hypotension, metabolic acidosis, raised lactate
Replace with additional boluses of 10ml/kg 0.9% NaCl
Maintain accurate fluid balance record, including gastric losses

Urgent time sensitive transfer
If baby delivered outside Dublin, referring hospital should perform transfer to avoid unnecessary time delays

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Implementation, Revision and Audit

- a. Implementation via REO of each Regional Health Area (RHA) and senior management team of each acute hospital
- b. Distribution to other interested parties and professional bodies
- c. The guideline will be reviewed on a **3** yearly basis
- d. Regular local audit of implementation and impact of this guideline through outcome and process measures is recommended to support continuous quality improvement
- e. It is the responsibility of each unit providing care for babies to audit the unit's practice regularly in order to ensure that care is being provided in line with guidelines and that any deviations are clinically justified
- f. The audit process should be coordinated in each unit under local neonatal/ paediatric clinical governance and should be taken from a multidisciplinary perspective where appropriate
- g. Where the audit identifies areas for practice improvement, it is the responsibility of each individual unit to implement changes and re-audit to support continuous quality improvement

Qualifying Statement

- a. These guidelines have been prepared to promote and facilitate standardisation and consistency of practice
- b. Clinical material offered in this guideline does not replace or remove clinical judgement or the professional care and duty necessary for each baby
- c. Clinical care carried out in accordance with this guideline should be provided within the context of locally available resources and expertise
- d. This Guideline does not address all elements of standard practice and assumes that individual clinicians are responsible for:
 - ✓ Discussing care with the parents/legal guardians and in an environment that is appropriate and which enables respectful confidential discussion
 - ✓ Advising parents/legal guardians of their choices and ensure informed consent is obtained
 - ✓ Meeting all legislative requirements and maintaining standards of professional conduct.

Appendices

Appendix 1 Acknowledgements

Dr Margaret Moran, Consultant in Neonatology and Prof Alan Mortell, Consultant Paediatric Surgeon in consultation with the National Clinical Programme for Paediatrics and Neonatology and the Neonatal Clinical Advisory Group has developed this guideline.

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Appendix 2 Guideline Review Process

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|--|-----------|------|
| National Clinical Lead for Neonatology, NCPPN | March | 2025 |
| Neonatal Clinical Advisory Group | September | 2025 |
| Paediatric Clinical Advisory Group | September | 2025 |
| National Clinical Advisor & Group Lead Children and young people | February | 2026 |