Abdominal Pain & Testicular Torsion Policies

Reference Number: RDF1750-23
Date of Response: 03/10/23

Further to your Freedom of Information Act request, please find the Trust's response(s) below:

Please be aware that the Royal Devon University Healthcare NHS Foundation Trust (Royal Devon) has existed since 1st April 2022 following the integration of the Northern Devon Healthcare NHS Trust (known as Northern Services) and the Royal Devon and Exeter NHS Foundation Trust (known as Eastern Services).

To the Royal Devon University Healthcare NHS Foundation Trust,

I would like a copy of any policies and guidelines regarding abdominal pain in children and adults. In addition, any policies on testicular torsion. I request all policies relating to the diagnosis and treatment of both. I would like the dates that the guidelines were issued.
Answer: Please see attached documents:

- *Acute-abdominal-pain-pathway.pdf attached. Issued March 2019.*
- *NDDH Paediatric Surgery v1.0_Redacted.pdf attached. (used at North Devon District Hospital). Issued January 2019.*
- *Abdominal-Pain-Meconium-Ileus-Constipation-and-Distal-Intestinal-Obstruction-Syndrome-DIOS.pdf attached. This is for paediatric Cystic Fibrosis patients. Issued January 2021.*
- *Pathway-for-Testicular-Torsion.pfd. Issued April 2021.*

For Devon Sexual Health: The Trust follow British Association for Sexual Health and HIV (BASHH) guidelines for presentation of epididymorchitis (testicular pain), this covers management of suspected testicular torsion as a differential or complication of this presentation:

- https://www.bashhguidelines.org/media/1242/eo-2019.pdf

See clinical features (page 5) and management recommendations (Page 9).

Generally, if someone has a history suggestive of testicular torsion and they present to sexual health, we would not manage this as it is a medical emergency - our guidelines would be to refer urgently to the Emergency Department. We follow the BASHH guidelines for Pelvic Inflammatory Disease (PID), which covers differential diagnoses for appendicitis, ectopic pregnancy and other medical emergencies:

- https://www.bashhguidelines.org/current-guidelines/systemic-presentation-and-complications/pid-2019/

NHS
Royal Devon
University Healthcare
NHS Foundation Trust

Clinical Guideline for:
Acute Abdominal Pain Pathway

SUMMARY

Abdominal pain is one of the most common indications for hospital assessment and admission.

There are a huge number of conditions that can cause abdominal pain arising from several systems including the gastrointestinal, urogenital, respiratory, vascular and musculoskeletal systems.

For those patients with significant intra-abdominal pathology requiring surgical treatment, prompt assessment, diagnosis and early intervention with the input of appropriate senior clinicians is essential.

PUBLICATION DETAILS

Author of Clinical Guideline	Consultant Colorectal Surgeon
Division/ Department responsible for Clinical Guideline	Surgical Services Division / Acute Surgery/Colorectal
Contact details	
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Approving body and date approved	Acute Surgery Governance: 17/01/2023
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CONTENTS

1. INTRODUCTION 3
2. BACKGROUND AND CONTEXT 3
2. GENERAL PRINCIPLES 3
3. CT SCANNING 4
4. CHILDREN 4
5. EXAMPLES OF CONDITIONS WITH APPROPRIATE SPECIALTY 4
6. ABDOMINAL PAIN REFERRAL PATHWAY 5

1. INTRODUCTION

This clinical guideline is designed to provide advice, guidance and direction to staff whilst leaving room for professional judgement, and adaptation, to fit individual circumstances.

2. BACKGROUND AND CONTEXT

There have been historical concerns as to who is the most appropriate service to see some patients with ambiguous diagnoses. Unfortunately at times this has led to patients waiting inappropriately while clinicians debate the appropriateness of a referral. Similarly there has been concern over patients been admitted under the wrong team with subsequent reluctance of other teams to be involved with, or take over care. The main purpose of this document is to address some of those communication issues and create clear terms of reference that all specialties can adhere to. It does not address management of specific conditions.

2. GENERAL PRINCIPLES

- A referral should never be refused although it is reasonable to suggest alternatives (clinic, alternative specialty etc.) if the referrer agrees.
- More than one specialty may need to be involved. If this is the case, the admission should be under specialty with most acute need to be decided by the referring clinician.
- Prompt assessment is essential, particularly in critical illness:
  - ABC
  - Targeted resuscitation
  - Early imaging
- All patients should be appropriately assessed before referral to another specialty.
- Where ED have referred to a team who subsequently feel a different specialty should be involved, it is that team's responsibility to refer onwards.
- If there is debate as to which specialty should admit a patient, the query should be escalated to the appropriate consultant(s).
- Early ICU involvement in critically ill patients.
- Patients can be reviewed in ED rather than admitted to SAU / MAU as long as it is done promptly by a registrar or above.
- If the main reason for admission is frailty in a patient who has other pathology, they should be admitted under elderly care with a plan for review by the appropriate specialty.
- Anyone presenting with a surgical complication should be referred to the specialty which performed the procedure.

3. CT SCANNING

- If the referring team feels that the patient has an acute abdomen (essentially any cause of peritonitis), they should not delay in organizing a CT abdomen, although the surgical team should not wait for this before reviewing the patient.
- The national target for acute abdomens is for urgent CTs to be performed and reported within 1 hour of request. There is almost no occasion which a laparotomy is performed without a CT being done.

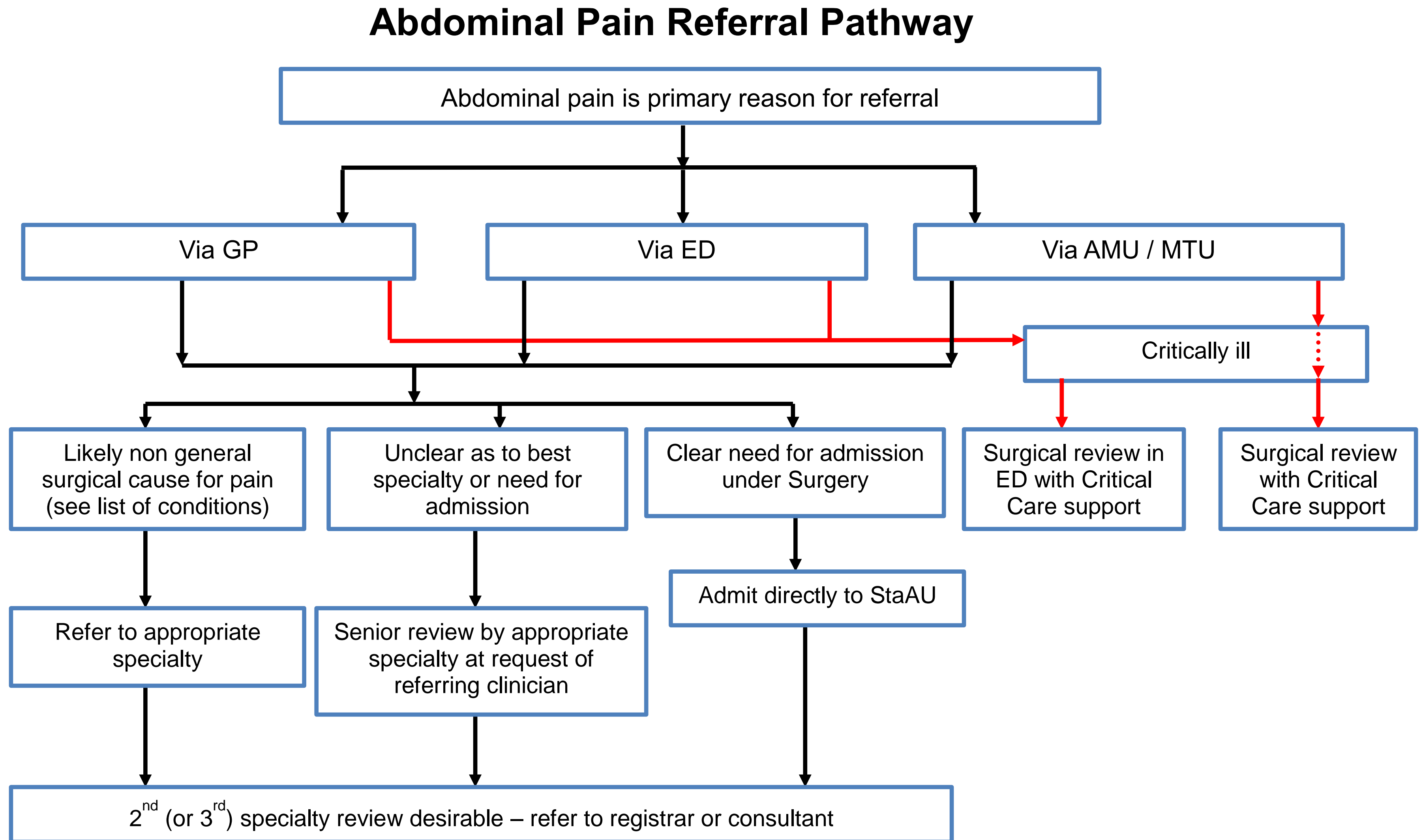
4. CHILDREN

4.1 All children should be under joint care with Paediatrics.

5. EXAMPLES OF CONDITIONS WITH APPROPRIATE SPECIALTY

Specialty	Conditions
Surgical	• Appendicitis. • Gallstone related pathology. • Acute pancreatitis. • Diverticulitis. • Ischaemic bowel. • Small / large bowel obstruction. • Perforated viscus. • Ureteric colic. • Ruptured AAA.
Medical / Gastroenterology	• Gastroenteritis. • UTI (including pyelonephritis). • Colitis. • Flare up of Inflammatory bowel disease (may need surgical input). • Retroperitoneal haematoma (not trauma-related). • Chronic pancreatitis. • Peptic ulcer.
Gynae	• Ovarian pathology. • PID. • Ectopic pregnancy. • Any pregnant woman who presents should be discussed with the O&G department even if the pathology is thought to be unrelated.

6. ABDOMINAL PAIN REFERRAL PATHWAY



<table>
<tr><td colspan="4">Title
Policy for the Practice of Paediatric Surgery in Northern Devon Healthcare Trust</td></tr>
<tr><td colspan="2">Author</td><td colspan="2">Author's job title
Consultant Anaesthetist (Paediatric Lead)</td></tr>
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Surgery</td></tr>
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- This is a policy and not a guideline so renamed as such and to go through the Clinical Effectiveness Committee. Amended 3.1 to reflect this.
- 7.2 Senior surgical and urology trainees should be competent at managing and operating on suspected torsion.
- 8.2 ITU renamed to ICU as per standard Trust wording.
- 16.1 The point of governance has been changed from forming a Paediatric Surgical Group to the current Paediatric Speciality Governance meetings that are already in place
- 16.4 Deleted section on who represents us as trust level as the Governance Workforce Committee no longer exists
- 16.5 Rephrased Regional Network Meetings to make sense.
- 16.5 Added where our KPI's will be reported: These will be reported annually to the Paediatric Speciality Governance and exceptions escalated accordingly.</td></tr>
<tr><td>1.0</td><td>May 2019</td><td>Final</td><td>Approved at Paediatric Speciality Governance Group, ratified by Clinical Audit and Guidelines Group.</td></tr>
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<tr><td colspan="4">Superseded Documents</td></tr>
<tr><td>Issue Date</td><td colspan="2">Review Date</td><td>Review Cycle
Three years</td></tr>
<tr><td colspan="4">Consulted with the following stakeholders:
• Paediatric General Surgery
• Anaesthetic Department
• Paediatric Speciality Governance</td></tr>
</table>

- Peri-Operative Medicine Department
- Day Surgery Department
- Emergency Medicine Department
- Paediatric Safe Guarding Lead
- Theatres

Approval and Review Process

- Paediatric Speciality Governance
- Clinical Effectiveness Committee

Local Archive Reference

Local Path

Policy for the Practice of Paediatric Surgery in Northern Devon Healthcare Trust

Filename

Policy for the Practice of Paediatric Surgery in Northern Devon Healthcare Trust

Policy categories for Trust's internal website (Bob)	Tags for Trust's internal website (Bob)
Surgical services	Surgery, Paediatrics, Elective, Emergency

CONTENTS

1. Purpose 4
2. Definitions 4
3. Responsibilities 5
4. General Considerations 5
5. Anaesthetic 7
6. General Surgery 9
7. Paediatric Urology 10
8. Trauma 10
9. Ear, Nose and Throat 11
10. Maxillofacial Surgery and Dental 11
11. Ophthalmology 11
12. Consent 11
13. Paediatrician Input 11
14. Paediatric HDU 13
15. Multiple Procedures 13
16. Monitoring Compliance with and the Effectiveness of the Policy 13
17. References 15
18. Appendix A: Emergency Admission Flow Chart 16
19. Appendix B: Contacts 17
20. Appendix C: Abbreviations 18

1. Purpose

1.1. The purpose of this document is to detail the process for Paediatric Surgery in Northern Devon Healthcare Trust.

1.2. This policy applies to all surgeons, peri-operative and anaesthetic staff providing surgery and anaesthesia to children and young people up to 16 years old.

1.3. Implementation of this policy will ensure that:

- There is clear direction on the hospital's position concerning elective and emergency anaesthesia for children.
- This protocol covers the majority of cases and situations; however there may be exceptional circumstances that require consultants to make informed decisions balancing the risk and benefit of proceeding outside of this policy. Where these situations arise there must be clear documentation about the discussions that took place between professionals and with the child and family.

2. Definitions

2.1. Paediatric Surgeon

A surgeon trained in general paediatric surgery and who has accredited at a tertiary paediatric hospital either as a senior Specialty Registrar (ST6-8) or as a Consultant.

2.2. Paediatric Anaesthetist

A Paediatric Anaesthetist who has completed advanced training in paediatric anaesthesia that was delivered in a designated specialist centre undertaking a wide variety of complex elective and emergency paediatric procedures, with the necessary associated paediatric critical care facilities. Alternatively they may have equivalent experience.

2.3. Age

"Gestational age" is the time elapsed between the first day of the last normal menstrual period and the day of delivery (expressed in weeks).

"Postmenstrual age" is the time elapsed between the first day of the last menstrual period and birth (gestational age) plus the time elapsed after birth (chronological age).

"Corrected age" (or "adjusted age") is a term most appropriately used to describe children up to 3 years of age who were born preterm. It represents the age of the child from the expected date of delivery

Neonate is an infant less than 4 weeks of age. Or if born preterm (<37 weeks) then less than 4 weeks corrected age.

3. Responsibilities

3.1. Executive Representation and Responsibility

Clinical Effectiveness Committee

3.2. Role of the Paediatric Surgical, Anaesthetic and Paediatric Teams

Providing safe, sustainable and high quality peri-operative care.

4. General Considerations

All elective cases on children under 16 should be planned on a designated paediatric anaesthetic list. If this is not possible, due to waiting times, pragmatism, inadequate numbers of cases or urgency then they should be scheduled first on a suitable adult list.

All children should be recovered in a recovery area with recovery nurses who are up to date with paediatric recovery competencies.

Parents/carers are able to be present with their child when they wake up.

Dedicated evidence-based policys on the management of pain, nausea and vomiting, intravenous fluid management, and anaesthetic emergencies should be in place.

When infants and children undergo procedures under sedation alone, recommended published guidance for the conduct of paediatric sedation should be used.

4.1. Safeguarding and Minimum Standards

All staff who are involved in the management of children or parents /carers are required to have up to date Level 2 Safeguarding Children training with the knowledge, skills, competencies, attitudes and values required outlined in the 2019 Intercollegiate Document ‘Safeguarding Children and Young people: Roles and Competences for Healthcare Staff’

Staff should also be familiar with the South West Paediatric Trauma Safeguarding Policy and the NDHT Safeguarding Children Policy

Injuries may be the first presentation of physical abuse, especially concerning are any bruising or injuries in non-mobile babies, infants or children and fractures in children less than 18 months of age.

Staff with Specialist roles working with children such as Paediatric Surgeons and Anaesthetists should have to date Level 3 Safeguarding Children knowledge, skills, competencies, attitudes and values.

NDHT has a Lead anaesthetist for safeguarding and child protection, as outlined by the RCoA role description who has Level 3 training and competencies. 'SafeguardingPlus' is a valuable recent RCOA initiative for an online safeguarding resource for anaesthetists: www.rcoa.ac.uk/safeguardingplus

Advice on management of safeguarding concerns is available during working hours from the Integrated Safeguarding team based at Barnstaple Health Centre and out of hours from the Paediatric Consultant on call. The team are also available to provide supervision regarding complex or difficult safeguarding cases and staff can contact them to arrange supervision for any cases they are finding challenging either at the time or in retrospect.

All anaesthetists and surgeons working with children must have up-todate paediatric life support training.

All staff working with children should have appropriate Disclosure and Barring checks as per trust policy.

There are designated leads for paediatrics in the following specialties:

4.1.1. General surgery

4.1.2. Orthopaedics

4.1.3. ENT

4.1.4. Urology

4.1.5. Ophthalmology

4.1.6. Community Dental

4.1.7. Maxillofacial surgery

4.1.8. Anaesthesia

4.1.9. Paediatricians

4.1.10. A clinical lead for paediatrics.

4.2. Referral to Tertiary Centre

The following should be referred to a tertiary paediatric centre as per the South West Surgical Network guidance:

- All neonates
- All infants/children requiring complex general surgical operations
- All oncological procedures (please also inform the paediatric oncology team)
- All specialist urology
- Consider referral in: All children with complex medical problems requiring even simple surgical procedures e.g. Congenital Heart Disease etc.
- All children likely to need peri-operative PICU.
- All major paediatric trauma (as per the major trauma guidelines)
- If there is any doubt please discuss with paediatric surgeons and/or anaesthetists at Bristol Children's Hospital.
- Anything that falls within specialised commissioning where we are not a recognised centre for that specialised commissioned service.

5. Anaesthetic

5.1. Patient Selection

The minimum age limit for administration of anaesthesia for elective procedures at NDDH is 3 months for term infants (with the exception of Ophthalmology down to 1 month for uncomplicated EUA eyes +/- probing naso-lacramial ducts etc).

Ex-preterm infants should generally not be considered for day surgery unless they are medically fit and have reached a corrected age of 6 months.

These limits may need to be adjusted for ex-premature infants and also depends on associated co-morbidities.

5.2. Supervision for Planned Surgery

A Consultant Anaesthetist must be aware of all children under the age of 16 undergoing planned procedures. It is their responsibility to assess the level of supervision required taking into account level of training of the attending anaesthetist.

The Anaesthetic Rota Coordinator keeps a copy of relevant paediatric competencies.

Children 5 years and over for planned procedures may be anaesthetised by a trainee with intermediate paediatric anaesthesia training or an SAS doctor with relevant experience under distant consultant supervision.

Children of 3 and 4 years of age for planned procedures may be anaesthetised by a trainee with higher paediatric anaesthesia training or SAS doctor with relevant experience under distant consultant supervision.

Children of 1 and 2 years of age for planned procedures should ordinarily have immediate consultant supervision unless agreed by the supervising consultant.

Children under 1 year of age requiring elective surgery should be discussed with the designated Paediatric Anaesthetists and be anaesthetised with their immediate supervision.

When anaesthetising a child under the age of 1 for a planned procedure, a second senior Anaesthetist should be available to support the Paediatric Anaesthetist.

The anaesthetic secretary or rota coordinator should be informed of elective cases in children of 5 years or younger by the Monday of the week preceding surgery (at the latest). If an elective case of 5 years or younger is cancelled the anaesthetic department should also be informed immediately.

If an elective paediatric case is cancelled by a grade other than a consultant, then this should be discussed with an Anaesthetic Consultant.

5.3. Emergency Anaesthesia

Any child requiring emergency surgery “out of the hours” should be discussed with the consultant surgeon and consultant anaesthetist on call.

Children under the age of 3 should only be considered for anaesthesia outside normal working hours for life and limb saving surgery. This reflects the balance of risk over benefit to the child. Factors such as the child’s age, co-morbidities and fasting status will need to be discussed between the Consultant Anaesthetist and Surgeon on call.

5.4. Peri Operative Medicine

All children for surgery should have a preoperative assessment.

In the vast majority of cases, this can be a phone consultation by the peri-operative team.

All cases that require Consultant review should be referred to the general peri-operative anaesthetic team, and advice sought from the Paediatric Anaesthetist as appropriate.

Guidance on the information to be provided for children undergoing surgery is outlined in the RCoA GPAS documentation.

Specific guidance on diabetes management is available on BOB.

If a child with complex needs has a named Paediatric Consultant, then that consultant should be consulted in providing a peri operative plan to facilitate the management of their condition (e.g. MCAD, diabetes).

Patients identified as having special needs or anxiety should be referred onto the reasonable adjustments pathway.

Information provided postoperatively should include the safe use of analgesia after surgery and discharge from hospital, and what to do and who to contact in the event of a problem or concern. This should include telephone numbers where advice may be sought 24 hours a day.

Information should be clear and consistent. It should be given verbally and also in written and/or electronic form.

Children should receive information before admission that is appropriate to their age and level of understanding. Information can be provided at face-to-face meetings by nurses and play therapists, and enhanced with booklets, web links, videos, Apps or other innovative means.

Post-menarcheal female patients should be made aware of the need for clinicians to establish pregnancy status before surgery or procedures involving anaesthesia.

6. General Surgery

6.1. Infants from 4 weeks corrected age to 12 months

All operations in this age group should be carried out by a Paediatric General Surgeon.

In an Emergency, when a Paediatric General Surgeon is unavailable and the patient is stable, they should be discussed with and potentially transferred to BCH.

Emergency surgery in a life-threatening situation, who are unsuitable for transfer, may be carried out by the on-call general surgeon and the on call anaesthetist at their discretion after discussion with BCH.

Some minor surgical procedures such as incision and drainage of an abscess may be able to wait until a paediatric surgeon and anaesthetist are available.

6.2. Children 1 – 5 years

Elective general surgery should be carried out by a Paediatric General Surgeon on designated paediatric lists.

Emergencies in this age group should be performed by a Paediatric General Surgeon where possible. If unavailable, surgery may be carried out by the on-call consultant general surgeon at their discretion.

If in doubt the child should be discussed and transferred to BCH unless surgery can wait until the Paediatric General Surgeon is available.

6.3. Children 5 – 16 years

Elective general surgery is carried out by a Paediatric General Surgeon on designated paediatric lists.

Emergency operations should be performed by the on-call surgical team at their discretion.

7. Paediatric Urology

In an emergency, if a Consultant Urologist with an interest in paediatrics is unavailable, the patient should be discussed and/or transferred to Bristol Children's Hospital.

Senior surgical and urology trainees should be competent at managing and operating on suspected torsion.

Torsion in adolescents is the responsibility of the on-call general surgical team.

Torsion should be considered in all children with abdominal pain.

Ultrasound should not be used to diagnose torsion (except in late presenters or in those with atypical features) and patients should be operated on locally.

In boys less than 5 years, the paediatric general surgeon or urologist with a paediatric interest should be informed.

8. Trauma

8.1. Children admitted with abdominal trauma, who do not meet the criteria for transfer to the major trauma centre, will be under the joint care of general surgical and paediatric teams, plus orthopaedics if there are bony injuries.

8.2. Children who require PICU should be transferred to BCH, e.g. severe head and chest injuries. Whilst waiting for retrieval to Bristol by WaTCH, children should be nursed in a safe and appropriate environment (ie. Emergency department, recovery, paediatric HDU or adult ICU).

8.3. Children requiring time critical transfer (eg head injuries) should involve the whole team. This will include the on call paediatrician, anaesthetist, intensivist and if appropriate, a neonatologist. A decision should be made on who the most appropriate person to conduct the transfer is.

8.4. In complex time critical transfers, it may be appropriate for two team members to conduct the transfer to ensure the correct skill mix.

8.5. The WaTCH retrieval team will be available for advice even if they are not carrying out the retrieval (see Appendix B for contact details)

9. Ear, Nose and Throat

9.1. The ENT guidance works to the same patient selection criteria and regional network guidance as these policys.

10. Maxillofacial Surgery and Dental

10.1. The Maxillofacial and Dental guidance works to the same patient selection criteria and regional network guidance as these policys.

11. Ophthalmology

11.1. The minimum age limit for administration of anaesthesia for elective ophthalmology procedures is reduced to 1 month for term infants (EUA eyes +/- probing naso-lacramial ducts etc.) on a case by case basis.

12. Consent

12.1. Consent for elective surgical procedures should be started in advance of the week of admission and the status of consent rechecked on the day of admission, reflecting the process that consent is continuous. This can be done by detailing the consent in the clinic letter and sending a copy to the child's parent or guardian.

12.2. All children should be included in discussions regarding their health and treatment as much as possible given their level of comprehension.

12.3. Consent must be informed and should be taken by the surgeon doing the procedure, or their designated junior if they are competent at fully explaining the risks and benefits of the surgical procedure.

13. Paediatrician Input

13.1. Elective Surgery

Wherever children undergo anaesthesia, there should be immediate access to a named consultant paediatrician with acute care responsibilities at all times.

There should be a clearly defined lead consultant for each patient. In the case of elective surgery this should be the Surgeon. The designated Paediatrician should nominally be the Consultant Paediatrician of the week.

The child, family and ward staff should be aware of the Lead Consultant's name.

13.2. Emergency surgery

An unwell child who presents to the Emergency Department should be triaged appropriately within 15 minutes of arrival and reviewed by an Emergency Medicine Physician.

The Surgical Consultant or registrar should review patients in a timely manner. Further management input from the paediatric team may be sought if clinically indicated

Paediatric patients may be referred by their GP directly to the surgical team. If accepted, then the Surgeons should inform Caroline Thorpe ward and the patient go there directly where they should be assessed by the surgical team.

There may be cases where the surgeon is otherwise involved in theatre and unable to attend, then the paediatricians can be asked to review the patient.

All children admitted, as an emergency under the care of a Surgical Consultant should receive joint care with the on call paediatric team.

Following the initial resuscitation of a critically sick or collapsed child, stabilisation and further management is led by a clinician of appropriate seniority, who has the competencies and knowledge to manage and oversee the treatment of a critically sick child.

13.3. Prescribing

Surgical teams should lead on prescribing, with support from the Paediatric ward team.

The British National Formulary for Children is available in all paediatric areas. Please refer to BOB and the Trust Pain Guidelines for prescribing of analgesia.

13.4. Ward rounds

The Surgical Team will see paediatric patients as part of their ward rounds.

The Surgical Team will discuss the plan with the paediatric team.

A clear plan will be written in the notes.

This allows information to be handed over at the morning Paediatric hand over.

Surgical patients on Caroline Thorpe may also be seen as part of the daily Paediatric Ward Team's ward round, so as to support their surgical admission.

14. Paediatric HDU

14.1. If a child requires Paediatric HDU it is likely that they should be referred to BCH as per the tertiary referral policys in this document.

14.2. Children requiring transfer may be stabilised on Paediatric HDU or other areas that are suitable, prior to transfer.

15. Multiple Procedures

15.1. If a child requires an elective procedure and is already waiting for another procedure under general anaesthetic by a different specialty, the clinician wishing to carry out the procedure must contact the surgeon from the other specialty to see if this is feasible.

15.2. Ideally this should take place 6 weeks in advance of the procedure, and admissions must be informed in order to take the extra procedure into consideration when planning the list.

15.3. The Anaesthetic Rota Coordinator should be informed.

15.4. If carried out at separate times, there should be a break of at least 4 weeks between procedures.

16. Monitoring Compliance with and the Effectiveness of the Policy

16.1. Governance

Paediatric Speciality Governance discusses any problems with the policy.

Suggestions for agenda items can be given to the lead for Paediatric Anaesthesia, Surgery or Paediatrics.

Paediatric patients will be reviewed at Morbidity and Mortality Meetings who have experienced morbidity or near misses after undergoing surgery.

16.2. Standards/ Key Performance Indicators

Equality Impact Assessment:

Group	Positive Impact	Negative Impact	No Impact	Comment
Age	X			
Disability			X	
Gender			X	
Gender Reassignment			X	
Human Rights (rights to privacy, dignity, liberty and non- degrading treatment), marriage and civil partnership			X	
Pregnancy			X	
Maternity and Breastfeeding			X	
Race (ethnic origin)			X	
Religion (or belief)			X	
Sexual Orientation			X	

16.3. Key performance indicators comprise:

- Unplanned inpatient admission following day-case surgery
- Readmission within 28 days
- Unanticipated admission to PICU following surgery
- A number of suggested audit topics specifically relating to paediatric anaesthesia are set out in the RCoA document 'Raising the standard: a compendium of audit recipes
- We will work to the Regional Networks frameworks.
- Participation in regional and national audit and quality improvement projects should also be encouraged
- These will be reported annually to the Paediatric Speciality Governance and exceptions escalated accordingly.

16.4. Process for Implementation and Monitoring Compliance and Effectiveness

Dissemination of policy to all relevant staff and onto BOB.

Staff to be informed of any revised documentation.

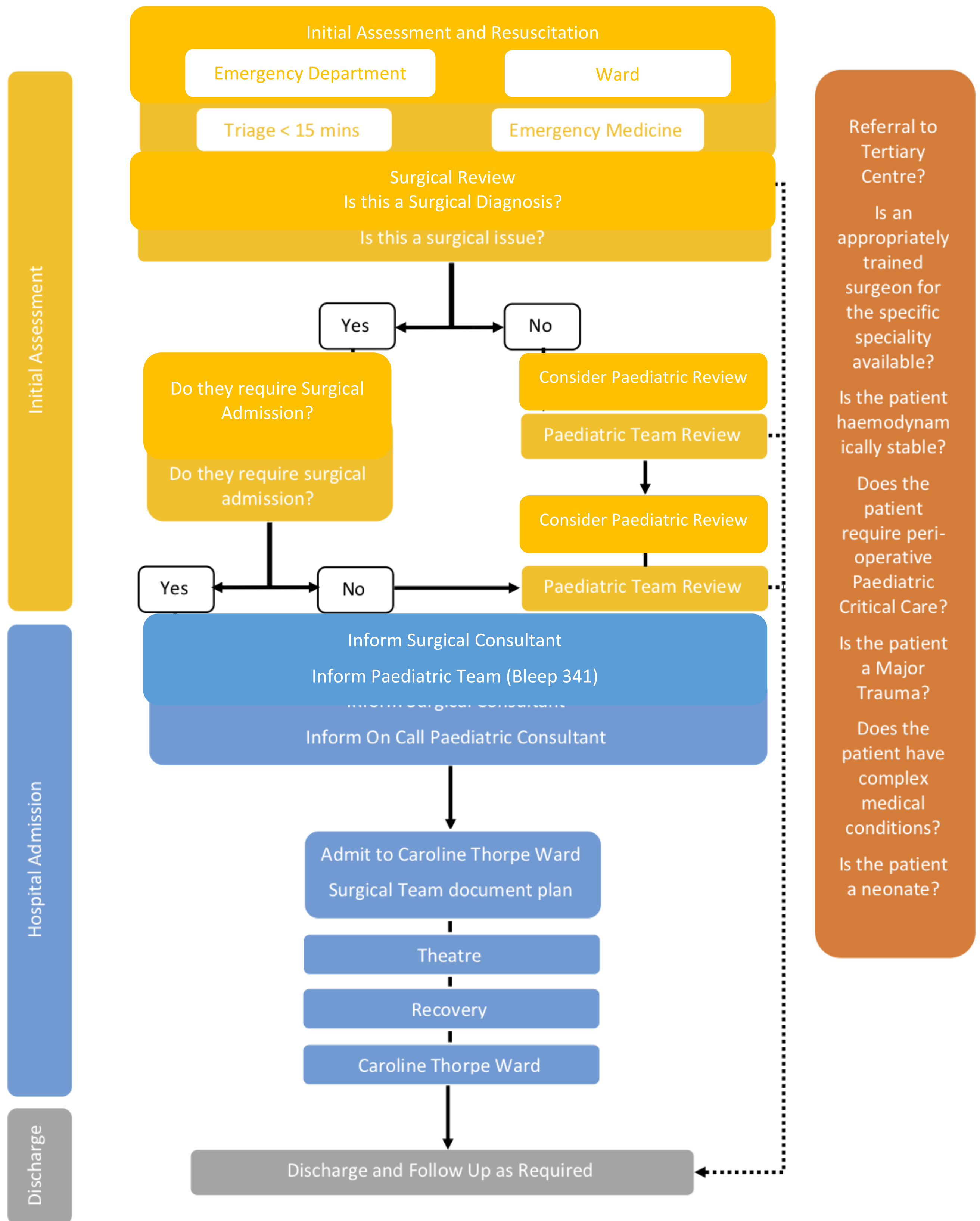
Non-adherence to the policy should be reported by use of the DATIX system. Incidents to be monitored and reviewed by the clinical governance team.

This policy will be subject to an audit review by the Paediatric/Surgical Liaison Group.

17. References

- South West Paediatric Surgery Network – Service Standards
- Bristol Royal Hospital for children Policys for General Paediatric Surgery of Childhood in the Regional Centre. Eleri Cusick.
- National Service Framework for children, young people and maternity services. DOH. February 2007
- Facing the Future: Standards for Paediatric Services. RCPCH 2015.
- Standards for Children and Young People in Emergency Care Settings. RCPCH, 2012.
- Ensuring The provision of children's surgical services in the district general hospital. RCS Children's Surgical Forum, 2013.
- Standards for non-specialist emergency surgical care of children. RCS Children's Surgical Forum, 2015.
- The acutely or critically sick or injured child in the district general Hospital. DOH 2006.
- Policys for the Provision of Paediatric Anaesthetic Services, Royal College of Anaesthetists, 2018.
- Joint professional guidance on the use of general anaesthesia in young children, RCoA, APAGBI, AAGBI & CAI. 2017. https://www.rcoa.ac.uk/news-and-bulletin/rcoa-news-and-statements/joint-professional-guidance-the-use-of-general
- Safeguarding Children and Young people: Roles and Competences for Healthcare Staff INTERCOLLEGIATE DOCUMENT Fourth edition: Jan 2019
- South West Paediatric Major Trauma Network Safeguarding Policy, Severn and Peninsula major Trauma Networks, May 2018
- NDHT Safeguarding Children Policy
- Royal College of Paediatrics and Child Health Child Protection Evidence including reviews on Bruising, Fractures, Visceral Injuries, Oral Injuries, and Burns

18. Appendix A: Emergency Admission Flow Chart



19. Appendix B: Contacts

Tertiary Centre Contacts			
WaTCH Retrieval Team	0300 0300799		
Urgent anaesthetic advice	Bristol Hospitals Switch 0117 9230000 ask for extension (wifi phone of consultant on call if in the hospital) or if no answer ask to be put through to consultant anaesthetist on call on their mobile.		
BCH Theatres			
Elective Pre-op Anaesthetic Advice	Via secretary:	01173427 008	

NDDH Contacts			
Title	**Name**	**Extension**	**Email**
Lead Paediatrician for Surgical Services			
Clinical Lead for Paediatrics			
Clinical Lead Paediatric HDU			
Clinical Lead Child Protection			
Lead Paediatric Anaesthetist			
Paediatric Anaesthetists			
Lead Paediatric General Surgeon			
Lead for Paediatric ENT	RDE:		
Lead for Dental			
Leads for Paediatric Ophthalmology			
Lead for Paediatric Maxillofacial Surgery	RDE:		
Lead for Paediatric Orthopaedics	Plymouth:		
Sister Paediatric Day Surgery			
Paediatric HDU Lead Nurse			
Paediatric Ward Matron			
Paediatric Matron			

20. Appendix C: Abbreviations

- SAS Staff grades and Associate specialists
- PICU Paediatric Intensive Care Unit
- APLS / EPLS / PALS Advanced Paediatric Life Support or equivalent
- BCH Bristol Children's Hospital
- WaTCH Wales & West Acute Transport for Children Service
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Paediatric Cystic Fibrosis Clinical Guideline for: **Abdominal Pain, Meconium Ileus, Constipation and Distal Intestinal Obstruction Syndrome (DIOS)**

Summary

This guideline outlines the diagnosis and management of paediatric cystic fibrosis patients who present with abdominal symptoms.

Key Points

Numerous gastrointestinal pathologies can complicate cystic fibrosis (CF), including meconium ileus in infants and distal intestinal obstruction syndrome (DIOS; previously called meconium ileus equivalent [MIE]) in older children and adults. Doctors with limited experience of CF may overlook these causes leading to unnecessary surgery. It is important that DIOS is considered in patients presenting with reduced stool frequency, pain, bloating and vomiting.

All CF patients presenting with abdominal symptoms should be discussed with the CF team.

Contents

1. Introduction 2
2. Differential diagnosis 2
3. Other causes 2
4. Meconium Ileus (MI) 2
5. Distal intestinal obstruction syndrome (DIOS) 3
6. Constipation 8
7. References 9
8. Publication Details 10

1. INTRODUCTION

1.1 Numerous gastrointestinal pathologies can complicate cystic fibrosis (CF), including meconium ileus in infants and distal intestinal obstruction syndrome (DIOS; previously called meconium ileus equivalent [MIE]) in older children and adults. Doctors with limited experience of CF may overlook these causes leading to unnecessary surgery. It is important that DIOS is considered in patients presenting with reduced stool frequency, pain, bloating and vomiting.

All CF patients presenting with abdominal symptoms should be discussed with the CF team.

2. DIFFERENTIAL DIAGNOSIS

Differential diagnosis of abdominal pain, +/- reduced stool frequency +/-vomiting in CF:

- DIOS – RIF mass
- Constipation - sigmoid loading, vomiting usually late.
- Appendicitis - always consider
- Intussusception – severe colicky pain, abdominal mass
- Gall-bladder disease - gall stones, pain worse after eating, right sub-costal tenderness.

3. OTHER CAUSES

Other causes of abdominal pain:

- Gastroenteritis
- Reflux oesophagitis and gastric ulceration (hyperacidity & slowed gastic emptying)
- Acute pancreatitis – esp PS patients, check amylase
- Renal calculi
- Inflammatory bowel disease
- Volvulus
- Fibrosing colonopathy (related to excessive use of high strength pancreatic enzyme replacement products)
- Splenic / hepatic capsular pain
- Clostridium difficile infection
- Urinary tract infection
- Irritable bowel syndrome

4. MECONIUM ILEUS (MI)

15% of Newborn CF presentations, associated with ileal atresia.

Features: Delayed passage of Meconium, abdominal distension, vomiting (bile). Radiological appearances (AXR) are characteristic with 'soap bubble' appearance of bowel contents and dilated small bowel. Antenatal perforation can occur with intra-abdominal calcification and peritonitis.

The baby should be stabilised for **urgent** transfer to the regional paediatric surgical unit - Bristol Royal Hospital for Children. Conservative treatment with gastrografin

enemas and/or via NGT, may be successful. Otherwise surgery will be required to remove meconium plug, exclude ileal atresia and resection of any non-viable bowel - needing a temporary ileostomy.

4.1 Key steps in stabilisation:

- Naso-gastric tube on free drainage.
- Site 2 IV lines, check U&E, Creat, Blood Gas, glucose, Ca, Mg, FBC, Coag, LFT, GGT, culture. Ensure parenteral vitamin K has been given.
- Respiratory support as necessary.
- IV maintenance fluids (10% dextrose with electrolytes – 'neonatal bag')
- Correct any electrolyte disturbance.
- Liaise with surgical team about need to start IV Antibiotics.

5. DISTAL INTESTINAL OBSTRUCTION SYNDROME (DIOS)

DIOS occurs with increasing incidence in older patients with cystic fibrosis. It is much more likely in those who are pancreatic insufficient (PI). Altered gut motility and viscid intestinal secretions contribute to this complication. Impaction of faecal material is usually in the distal ileum, caecum and ascending colon. **The CF Dietician plays a central role in its management.**

5.1 Risk factors include:

- Inadequate fluid intake and dehydration (Hot weather, exercise, fever, CFRDM)
- Poor compliance with enzyme therapy – correct dose spread through eating (start and during, but an extra at the end of notably fatty meals due to delayed gastric emptying). Note; enzymes can inactivate if stored at >20°C. High protein sweets (gelatine based) need enzymes.
- Poor fibre diet (although this is linked more to constipation).
- Drugs – opiates, anti-cholinergics, PPI's (omeprazole), anti-emetics(ondansetron).
- High energy diets are important, but excessive fat content sometimes needs to be moderated and replaced with carbohydrates if steatorrhoea is not controlled by enzymes (up to 10,000 iu lipase/kg).

5.2 Clinical presentation

- Typically in older children and adults (but consider at any age)
- Abdominal pain; constipation and bloating.
- May be palpable right iliac fossa mass.
- +/- vomiting.

Differential diagnosis (above) is important.

5.3 Investigations (Discuss with radiologist)

- AXR - may show a granular/bubbly mass of faecal material in RLQ; +/or dilated bowel.
- Stool - for culture, virology.
- Blood tests: Renal U&E, Ca, Mg, amylase, liver function, WBC, glucose, inflammatory markers and cultures.
- Urinalysis

Consider:

- Abdominal Ultrasound. – To detail abdominal anatomy, free fluid, bowel thickening, appendix mass, intussusception, gallstones and evidence for portal hypertension etc.
- Erect CXR – if peritoneal irritation - to exclude perforation.
- Barium / Gastrografin enema – by specialist radiologist, can diagnose and help treatment at same time.
- Surgical opinion – if signs of peritoneal irritation or complete obstruction.
- If condition worsening and if there is diagnostic uncertainty CT abdomen may be required, especially if surgery is contemplated.

5.4 Management

Acute / Sub-Acute
General measures

- Wt (compare with most recent stable value).
- Analgesia. Avoid opiate analgesia (use IV Paracetamol)
- Anti-emetic – but note that $5HT_3$ antagonists (Ondansetron) can cause constipation, and some prokinetic agents may worsen colic.
- Abdominal distension, regular or bilious vomiting – place NGT to help relieve pressure in upper GIT.
- Venous access (at time of bloods above)
- Fluids balance, with input and output charted. Calculate maintenance and estimate dehydration. On-going maintenance fluid and replacement of fluid deficit (rehydration) is essential. This will need to be given IV if patient is vomiting or dehydrated. 0.9% Saline recommended for initial rehydration fluid.
- Correct any electrolyte disturbance (esp. hypokalaemia).
- Review fluid regimen regularly (6 hourly min) guided by clinical assessment of hydration and repeat electrolytes (12 hourly min).
- Continue with usual enzyme preparation even if not eating, starting with 2 caps every 3-4 hours. Pancrex powder is available from pharmacy for patients who have a gastrostomy or NG tube and are unable to eat. A heaped teaspoon mixed with 50mls of sterile water every 2-4 hours is usually sufficient until they can resume their Creon.
- Sign and symptoms of obstruction should be discussed with the surgical team.

5.5 Specific treatments:

5.5.1 Gastrografin (oral) - Do not give if complete bowel obstruction (bile stained vomit). Maintain an intravenous route if Gastrografin is to be used.

< 10 kg	25 ml in 75 ml water / squash
10 - 25 kg	50 ml in 200 ml water / squash
>25 kg	100 ml in 400 ml water / squash

Dose can be repeated daily **but** if symptoms worsen or complete obstruction ensues, seek surgical opinion.

Follow up a therapeutic response (symptom relief and passage of significant loose stool) with twice daily doses of **macrogol** electrolyte solution (eg. **Movicol**) to maintain a regular loose stool (warn patient about this in advance) for 1-2 days before titrating back to a single daily dose for at least 1 month, maintaining a regular

soft stool, reviewed depending on clinical progress. Lactulose may be an alternative but needs to be taken with adequate fluids with attention to teeth cleaning.

5.5.2 **Gastrografin (Rectal/Colonic instillation)** - can be used if vomiting++, distension and failure of oral medication. This must be administered under radiological guidance by an experienced radiologist. Caution if there is colonic dilation - discuss with surgeons.

The patient **must be receiving IV fluids** for a gastrografin enema as it is hyperosmolar (neat gastrografin attracts approx. 12 times its volume of fluid). Plain abdominal x ray required 1 hour post procedure to confirm efficacy. This will also help to screen for features of a fibrotic colon or strictures due to fibrosing colonopathy , or other pathology as residual gastrografin, which is radiological contrast, helps define anatomy.

Dose as oral, but dilute to 5x volume with water for < 5 years and 4x times volume with water for > 5 years.

A 'wash and clear as you go' technique using colonoscopy
In adults with obstruction failing oral/NGT treatment, consideration be given to emergency colonoscopy using saline, macrogol solution, gastrogaffin or N-acetylcisteine solution to washout the colon aiming to clear all the way to the terminal ileum. This should be performed by an experienced gastroenterologist or GI surgeon.

5.5.3 **Macrogol electrolyte solution** (Movicol / Movicol Paediatric Plain / Klean Prep). Aim is to take solution until watery stool is passed PR and symptoms resolve. NGT often required to administer sufficient amounts.

Regular on-going Movicol or Lactulose will be required once relief achieved. Stop if symptoms worsen, and discuss with surgical team.

Children – Movicol Paediatric Plain. Each sachet mixed with 65mls water or squash. This is also a popular means of disimpaction in constipation. It can be used in quite large dosage safely even in the young. It is essential to be sure of the diagnosis and to ensure the patient takes adequate oral fluids. There are no published studies on comparative efficacy to other agents such as Gastrografin. It is best used for patients with radiological loading of the distal colon.

Dose - escalating according to size:

< 10 Kg	1/2-2 sachets Movicol Paediatric Plain daily (divided doses)
10 - 20 kg	4 sachets Movicol Paediatric Plain (divided doses). Increase by 2 sachets every 1-2 days to maximum of 8 sachets daily.
20-50 kg	6 sachets Movicol Paediatric Plain (divided doses). Increase by 2 sachets every 1-2 days to max 12 sachets daily.

Maintain until effective bowel clearance (1-2 days of loose stool) and symptom relief then decrease to 1 - 4 sachets daily to maintain a regular soft stool or Lactulose as daily maintenance.

Adults (>50Kg) – Movicol.
Each sachet is diluted in 125ml of water / squash.

4-8 sachets in 1 litre of water daily.

5.5.4 Klean Prep.
Can be used as an alternative to Movicol, to flush the intestines out, but is likely to require delivery by an NGT. The aim is to get passage of clear effluent PR. However confirmation of clearance requires an AXR as the mobilisation of inspissated stool can be intermittent.

Do not give with complete obstruction or bile stained vomit.
Add contents of one sachet to 1 litre of water.
Give earlier in day, not at bedtime to avoid aspiration.

Start at 10mls/kg/hr increasing to 25mls/kg/hr in increments as tolerated (given in aliquots).

Max volume given in 4 hours is 100ml/kg or 4 litres max (whichever is smaller).
After 4 hours, a review, including assessment of abdomen and circulation, is required before delivering a repeat treatment sometimes best to defer this to following day (max daily dose is 200ml/kg or 8 litres).

In those with diabetes or impaired glucose tolerance, hypoglycaemia is a risk, and blood glucose should be monitored.

5.5.5 N-Acetyl cysteine. (Parvolex) 200mg/ml (dilute to 50mg/ml by adding 3x vol as water or squash.

This acts as a mucolytic and breaks up the protein matrix of the inspissate.
This tastes and smells foul - rotting eggs so given via naso-gastric tube or dilute with some squash for drinking.

There are no published trials on its efficacy.

Dosage	(Give up to 8 hourly).
Infants-2 yrs	1-2g
2-7 yrs	2-3g
8-adults	4-6g

After implementing the above, if no improvement after 24 hours, reconsider diagnosis, discuss with CF consultant regarding further investigation and referral to surgeons.

5.6 Chronic symptoms of DIOS

General considerations about improving digestion:

Ensure:

- Up to date assessment by CF dietician.
- PERT compliance: dose, timing of intake, always with snacks and how they are taken (opened or swallow whole). An extra dose at the end of a meal may help in those with delayed gastric emptying. Pancreatic enzymes are inactivated by heat – eg in a car glove compartment in the summer.
- Adequate dietary fibre and fluid intake.

Consider:

- Toilet routine (abnormal behaviours in children) – may require positive reinforcement star chart, and psychological input.
- If fat intake is very high and stool frequency/volume not controlled by reasonable PERT, symptoms may improve by reducing fat and augmenting carbohydrate in diet.
- Agents that reduce gastric acid production (PPI's and H2-antagonists) may improve the action of PERT.

Check:

- Undiagnosed liver disease
- An estimation of stool fat (semi-quantitative stool fat stain)
- Exclusion of coeliac disease (Blood for TTG)

5.7 Chronic DIOS - add-on treatment options

1. Laxatives/stool softeners:

Movicol

1-6 years: **Movicol Paed Plain** 1 - 4 sachets daily, each in a cup of squash /water.
7-12 years; **Movicol Paediatric Plain** 2 to 4 sachets daily, with water as above.
>13 years: **Movicol** 1-3 sachets daily, with 125 ml water per sachet.

Lactulose

This is used in mild, chronic cases. Consider when will not take Movicol. Patient needs to maintain good hydration.
Dosage:
1-5 years 5 ml twice daily
5-10 years 10 ml twice daily
>10 years 15 - 20 ml twice daily.

Fabrol Sachets (Acetyl Cysteine)
2-4 sachets daily, orally.

Gastrograffin
Consider intermittent (weekly) use of 50-100 mls with 400mls of squash

2. Prokinetic agents

Macrolide antibiotics (motilin agonists). Erythromycin 3mg/Kg , 6-12 hourly or Azithromycin (optimal dose uncertain – probable dose dependent effect. Antimicrobial effects and potential interactions need to be considered)

Domperidone. 0.25/Kg **max** 3 times daily before food, **max 10mg 3 times daily**. (PRAC recommends restricting use of domperidone EMA/129231/2014)

3. H2-antagonist

May augment PERT. Ranitidine 2 - 4 mg / kg twice daily (max 150mg bd in adults)

4. PPI's
May augment PERT. Longterm use discouraged, risk of osteoporosis. Omeprazole 0.4 - 0.7 mg / kg 1-2x daily, (max dose 40mg daily). Lanzoprazole 0.5mg/Kg once daily (max 30mg daily).

Note that side effects include GI disturbance including loose stool as well as constipation.

6. CONSTIPATION

Simple constipation maybe difficult to distinguish from early DIOS. If in doubt, treat as DIOS.
An AXR should be able to tell you if a patient has simple constipation - faecal loading in the descending colon or rectum with no signs of obstruction.

6.1 General management:

- Assess compliance with pancreatic enzymes.
- CF dietician must play a key role in management.
- Check diet for **adequate fibre** and **fluid intake**.
- **Do not** prescribe bulking agents (ispaghula husk, methylcellulose) as may worsen symptoms.
- Check that current drugs are not associated with constipation (opiates, ondansetron)
- Check for haemorrhoids.
- Ensure good hydration and normal electrolytes.
- Toilet routine encouraged – sit on loo after meals.
- Consider star charts and incentives in children.
- Schools may be able to provide access to more private loo (staff facility, because of smells etc). Teacher requested to prompt toilet use after lunch.
- Position on toilet – legs must not dangle, firm footing needed, knees to chest to help pushing.

6.2 Medication options:

Movicol. Disimpaction regimen, as for acute DIOS.

Maintenance (titrated against stool frequency):

1-6 years:	**Movicol Paediatric Plain** 1 to 4 sachets daily, each in a cup of squash or water.
7-12 years;	**Movicol Paediatric Plain** 2 to 4 sachets daily.
>13 years:	**Movicol** 1-3 sachets daily, with 125 ml water per sachet.

Lactulose
Consider when will not take Movicol. Patient needs to maintain good hydration.
Dosage:

1-5 years	5 ml twice daily
5-10 years	10 ml twice daily
>10 years	15 - 20 ml twice daily.

Sodium Picosulphate liquid.

This is a stimulant laxative. Titrate dose closely to get acceptable stool frequency / consistency. Sometimes used once or twice per week. This liquid is quite pleasant tasting and therefore acceptable to most patients. Antibiotics reduce its effectiveness.

<4 years	250 mcgs/kg at bedtime
4-10 years	2.5-5mg at bedtime
>10 years	5-10mg at bedtime

Senokot is also a stimulant laxative, in general **should be avoided** in CF as it can lead to loss of normal bowel movement and worsening of the condition.

Prokinetics
May consider where other interventions above have failed to achieve improvement. **Low dose macrolide** and/or **domperidone** (note dose ceiling above) can be tried**.** **Prucalopride** has been used in female adult patients, but should be used with caution, ideally with input from a gastroenterologist.

7. REFERENCES

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8. PUBLICATION DETAILS

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Guideline / Pathway for:
Suspected Testicular Torsion

Summary

This guideline outlines the pathway for managing the patient with suspected testicular torsion from point of referral to scrotal exploration in theatres.

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Suspected Testicular Torsion Pathway