

Bowel Obstruction

Protocol April 2018

Study Advisory Group Members

Dr	Bushra	Alam	Acute Medicine
Dr	Conrad	Beckett	Physician
Mr	Graham	Copeland	Surgeon
Dr	Alison	Culkin	Dietitian
Ms	Sharon	Drake	Lead (NELA)
Mr	Martyn	Evans	Surgeon
Ms	Nicola	Fearnhead	Surgeon
Dr	Jane	Greaves	RCN
Mr	Sunjay	Kanwar	Surgeon
Prof	Hans-Ulrich	Laasch	Interventional Radiology
Mr	Matt	Lee	Audit Lead (NASBO)
Mr	Jose	Lourtie	Audit Lead (NELA)
Ms	Susan	Moug	Surgeon
Dr	Dave	Murray	Anaesthetist (NELA)
Mr	Ron	Newall	Lay Rep
Dr	Marlies	Ostermann	RCP
Ms	Julie	Patton	RGN
Mr	Constantinos	Regas	Lay Rep
Mr	Thusitha	Sampath	Surgery trainee
Dr	John	Wilson	Physician

Steering Group Members

Mr	John	Abercrombie	RCS
Dr	John	Butler	FICM
Dr	Krishna	Ramachandran	RCOA

Clinical Coordinators

Dr	Antony	Michalski	Paediatric Oncologist
Mr	Martin	Sinclair	Surgeon

Non clinical staff

Hannah Shotton	Clinical Researcher
Heather Freeth	Clinical Researcher
Kathryn Kelly	Researcher
Marisa Mason	Chief Executive

Introduction

Acute intestinal obstruction accounts for 10% of emergency surgical admissions¹. This occurs when there is an interruption to the forward flow of intestinal contents. Intestinal obstruction is associated with complications such as ischaemia, perforation and aspiration pneumonia. The decision making process can be quite challenging; surgeons have to make critical decisions with regard to non-operative management vs surgery. Delays in diagnosis, radiological investigation and surgical intervention can significantly affect patient outcome. Adhesions from previous surgery are currently the leading cause of small bowel obstruction in industrialized countries (~70%), followed by malignancy, inflammatory bowel disease, and hernias². Malignancy and volvulus are the commonest causes of large bowel obstruction.

According to Hwang et al³, small bowel obstruction alone accounts for more than 300,000 operations annually in the United States². Most of the patients managed with bowel obstruction require attention to nutrition, electrolyte balance, symptom control and intestinal decompression. At the moment there is no national guideline or framework for the management of acute intestinal obstruction. There are emerging guidelines for the management of small and large bowel obstruction, however it is felt that there is considerable variation of the management of bowel obstruction, with variation in outcomes^{2, 4, 5, 6}.

Bowel obstruction may be caused by intrinsic or extrinsic mechanical obstruction. Patients with small bowel / high intestinal obstruction are likely to experience symptoms of vomiting and central colicky abdominal pain. Patients with large bowel/low intestinal obstruction are likely to experience the symptoms of abdominal distension and constipation⁷.

Non-operative management of all forms of bowel obstruction includes good initial resuscitation with oxygen and IV fluids, NG tube aspiration, adequate analgesia and close monitoring of the patient for signs of ischaemia or perforation, when early surgical intervention would be needed. This includes regular clinical assessment for peritonitis and observation monitoring for signs of sepsis.

Specific non-operative therapeutic intervention for adhesive small bowel obstruction includes a water soluble contrast study which has a diagnostic and therapeutic value and may overcome the obstruction by drawing fluid into the bowel (osmotic effect) resulting in a shorter hospital stay⁸.

For large bowel obstruction due to tumours colonic stenting may be used as a definitive treatment or as a bridge to surgery^{5, 9, 10, 11, 12}. This is not currently widely adopted across the UK as a treatment option and anecdotally there is significant variation in its use.

Surgery for small bowel obstruction may involve laparotomy and division of adhesions, small bowel resection, stoma formation, hernia repair and bypass operations. Increasing use of laparoscopic surgery for small bowel obstruction has been seen but consensus has not been reached as to the indications for this treatment[Laparoscopic versus open surgery in small bowel obstruction¹³.

Large bowel obstruction may be treated surgically by bowel resection, stoma or bypass.

When surgery is required, mortality can exceed 10%, far higher than seen in elective colorectal surgery. The majority of patients requiring surgery can be categorized as “high-risk” and require consultant delivered care and admission to critical care after surgery.

Prompt recognition of patient deterioration, sepsis, and perforation is needed. Surgery may be required within a matter of hours for surgical source control of sepsis, or to prevent impending perforation¹⁴.

Guidelines and standards

NASBO: Report of the National Audit of Small Bowel Obstruction, 2017

National Audit of Small Bowel Obstruction (NASBO) Protocol V10, 2016

Association of Surgeons of Great Britain and Northern Ireland, Royal College of Surgeons Commissioning guide: Emergency general surgery (acute abdominal pain), 2014

National Institute of Health and Clinical Excellence. Colorectal Cancer: The Diagnosis and Management of Colorectal Cancer Management of Local Disease Colonic Stents in Acute Bowel Obstruction Clinical Audit Tool Implementing NICE Guidance. Nice Clinical Guideline 131, 2014

National Institute for Health and Clinical Excellence. Colorectal Cancer Information for the public, 2011

Moran et al. Colorectal Disease The Association of Coloproctology of Great Britain and Ireland. (ACPGI) Guidelines for the management of Cancer of the Colon Rectum and Anus, 2017

Healthcare improvements Scotland. *Scottish Palliative Care Guidelines – Bowel obstruction*, 2015. Retrieved from Scottish NHS:
<http://www.palliativecareguidelines.scot.nhs.uk/guidelines/symptom-control/bowel-obstruction.aspx>

NICE Colorectal cancer: diagnosis and management. Clinical guideline [CG131] 2014. Retrieved from www.nice.org.uk:
<https://www.nice.org.uk/guidance/cg131/ifp/chapter/acute-large-bowel-obstruction>

ACPGI Emergency General Surgery Sub-Committee. Recommendations for the management of large bowel obstruction, June 2017

Report of the Royal College of Surgeons of England. The Higher Risk General Surgical Patient: Towards improved care for a forgotten group, 2011

Association of Surgeons of Great Britain and Ireland. Emergency General Surgery – A consensus statement, 2017. <http://www.asgbi.org.uk/emergency-general-surgery-a-consensus-statement/EGS%20Website%20statement.pdf>

Aims and objectives

Overall aim:

To identify remedial factors in process of care of patients with both large and small intestinal obstruction.

Objectives

Clinical

To identify and assess the care delivered to patients presenting with acute bowel obstruction at all points in the pathway including:

- Emergency admission factors (including recognition prior to hospital admission)
- Initial assessment and diagnosis (including risk assessment and delays in diagnosis)
- Admission to the ward (including the route of admission, admitting specialty and delays in admission)
- Treatment plan (including continuity of care and communication)
- Imaging (including time to imaging, the reporting of imaging and communication of results)
- Decision making (including multidisciplinary input and clinician seniority)
- Non-surgical therapy
- Nutrition
- Surgery (including delays, decision making and continuity of care)
- Post operative care (including location, nutrition and complications)
- Discharge and follow up arrangements
- End of life care

Organisational

To examine organisational aspects of care including:

- Access to services (including CT, multisite working and emergency surgery)
- Staffing
- The use of local and national guidelines and protocols
- Networks of care
- Staff training regarding acute bowel obstruction management
- Communication
- Audit/governance

Methods

Population/Inclusions

Data will be collected on all patients aged 16 and over admitted to hospital with an obstructed bowel over a four week period.

Patients will be identified using the following ICD10 codes (ICD10 code for acute bowel obstruction to be recorded in the first three positions in order for the patient to be included in the study)

- K56.1 Intussusception
- K56.2 Volvulus
- K56.3 Gallstone ileus
- K56.4 Other impaction of intestine
- K56.5 Intestinal adhesions [bands] with obstruction
- K56.6 Other and unspecified intestinal obstruction
- K40.0 Bilateral inguinal hernia, with obstruction, without gangrene

- K40.1 Bilateral inguinal hernia, with gangrene
- K40.3 Unilateral or unspecified inguinal hernia, with obstruction, without gangrene
- K40.4 Unilateral or unspecified inguinal hernia, with gangrene
- K41.0 Bilateral femoral hernia, with obstruction, without gangrene
- K41.1 Bilateral femoral hernia, with gangrene
- K41.3 Unilateral or unspecified femoral hernia, with obstruction, without gangrene
- K41.4 Unilateral or unspecified femoral hernia, with gangrene
- K42.0 Umbilical hernia with obstruction, without gangrene
- K42.1 Umbilical hernia with gangrene
- K43.0 Ventral hernia with obstruction, without gangrene
- K43.1 Ventral hernia with gangrene
- K44.0 Diaphragmatic hernia with obstruction, without gangrene
- K44.1 Diaphragmatic hernia with gangrene
- K45.0 Other specified abdominal hernia with obstruction, without gangrene
- K45.1 Other specified abdominal hernia with gangrene
- K46.0 Unspecified abdominal hernia with obstruction, without gangrene
- K46.1 Unspecified abdominal hernia with gangrene

Exclusions

The following will be excluded where recorded in isolation (i.e. not with an included ICD10 code):

- K55 Vascular disorders of the intestine
- K56.0 Paralytic ileus
- K56.7 Ileus, unspecified
- K91.3 Postoperative intestinal obstruction

Participating sites

All hospital providers that admit/treat patients with bowel obstruction including: acute hospitals, specialist hospitals, community hospitals, independent hospitals, treatment centres etc will be asked to participate in the study.

Sample size

Based on HES data, over a one year period (2016/17) there were 55,996 patients admitted to hospital with one of the included ICD10 codes; this equates to approximately 1077 admissions per week.

Based on data collected as part of the pilot study, there were an average of 333 cases per hospital per year, which equates to just over 6 cases per hospital per week. If data were collected from 300 hospitals over a 4 week period (there are approx. 340 'acute' sites listed on our DB) this would give us a sample of approximately 7200 cases.

Within the pilot data, approximately 6% of patients died prior to discharge, and 25% of patients underwent surgery (so this would be approximately 432 deaths within the pool, and 1800 patients who underwent surgery)

- Sample size for clinician questionnaire – 2000 cases

- Sample for case note review – To be confirmed once the assessment form has been designed.

If we need to sample cases for inclusion, this will be based on including:

- All deaths
- A sample of patients who underwent surgery
- A sample of patients (no surgery/discharged alive) + AKI (N17) and/or ventilation (E85.1 & E85.2)

Sample period

Data will be collected over a four week period from 00:00 Monday 16th April– 23:59 Sunday 13th May 2018.

Case identification

Within each Trust/Health Board NCEPOD has a Local Reporter (usually employed in clinical audit) who is responsible for providing the details of cases for inclusion to NCEPOD. At the start of the study the Local Reporter will be contacted and sent details of the study criteria. Patients with bowel obstruction will be identified retrospectively through ICD10 coding via completion of a spreadsheet with selected data from central hospital records. This will include patient details (NHS number, hospital number, age), admission/discharge dates, patient destination (including death)/source, ICD10 codes (primary and all, relating to bowel obstruction and AKI), details of the admitting consultant, operation details (responsible consultant, dates and OPCS codes), OPCS codes for any ventilation provided, and details of any previous admissions for bowel obstruction in the previous 12 months.

Method of data collection

Clinician questionnaire

A clinical questionnaire will be sent to the consultant who was responsible for the patient at the time of hospital admission. Within this there will be instruction to pass the questionnaire on to most appropriate clinician (i.e. to the operating clinician if the patient underwent the surgery). The questionnaire will be sent to the NCEPOD local reporter for dissemination. Reminder letters will be sent at six weeks and ten weeks where the data are outstanding.

Case notes for peer review

- Clinical notes from the time of admission to discharge
- Critical care notes
- Care pathways
- Nursing notes
- Fluid balance charts
- Weight charts
- Malnutrition Universal Screening Tool (MUST) score
- Food charts
- Oral care charts
- Radiology and xray reports
- Endoscopy reports
- Biochemistry and haematology reports
- Theatre notes

- Anaesthetic charts
- Consent forms
- Drug charts
- Discharge summary
- Any separate dietetics notes

Upon receipt at NCEPOD the case notes will be made anonymous for patient identifiable information.

Reviewer Assessment form:

A multidisciplinary group of reviewers (detailed below) will assess the case notes and clinician questionnaires at review meetings held at the NCEPOD office and give their opinion on quality of care via completion of the reviewer assessment form.

Organisational questionnaire

An organisational questionnaire will be disseminated to all participating sites and collect data on organisational aspects of care of patients with bowel obstruction.

Pilot Study

A pilot study will be performed to test the method of data collection (including the feasibility of accessing critical care and primary care data) and the data collection materials and ensure that they are robust.

Analysis and Review of Data

Case Reviewers

A multidisciplinary group of reviewers will be recruited to review the data collected and provide opinion on the care received by this group of patients, from admission to discharge. The advisor group would be made up of surgeons (including general, gastrointestinal and colorectal surgeons), radiologists, nurses, physicians (including emergency medicine and acute physicians), intensivists, anaesthetists, and dieticians.

Data Entry

All clinician questionnaire data will be electronically collected and combined with data from the assessment form completed by the case reviewers. Quantitative data analysis will be undertaken using Excel and qualitative analysis will be undertaken by reviewing the themes arising from the Advisor meetings.

Confidentiality and data protection

Once the data have been extracted by the NCEPOD researchers, the questionnaires and casenotes will be anonymised to remove patient identifiers prior to review by the case reviewers. All electronic data are held in password protected files and all paper documents in locked filing cabinets. As soon as possible after receipt of data NCEPOD will encrypt electronic identifiers and anonymise paper documents. Section 251 approval has been obtained to perform this study without the use of patient consent.

Dissemination

On completion of the study a report will be published and widely disseminated.

Timescale

	Jan 18	Feb 18	Mar 18	Apr 18	May 18	June 18	July 18	Aug 18	Sept 18	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	June 19	July 19	Aug 19	Sept 19	Oct 19	Nov 19	
First meeting of the study advisory group (SAG)	█																							
Write the protocol	█	█	█	█																				
Design the questionnaires				█	█																			
Write strategy of analysis				█	█																			
Advertise the study				█	█																			
Design study database			█	█	█																			
Test data collection method			█	█	█																			
Second meeting of the SAG				█																				
Final protocol to SAG/IAG/HRA					█																			
Advertise for reviewers					█																			
Clinical data collection						█	█	█	█															
Case reviewer meetings									█	█	█	█	█	█	█	█								
Data analysis														█	█	█	█							
Presentation to SAG and Reviewers																█	█							
Presentation to SG																█	█							
CORP IAG																█	█							
Write the report																█	█	█	█	█				
First draft to SG/SAG and reviewers																█	█							
Second draft to SG/SAG and reviewers																	█	█						
Report design and print																			█	█	█	█		
Embargo copies sent																							█	
Publish the report																								█
Disseminate findings																								█

References

1. Association of Surgeons of Great Britain and Ireland & the Royal College of Surgeons. 2014. Commissioning Guide: Emergency General Surgery (acute abdominal pain)
2. National Audit of Small Bowel Obstruction. 2017. Report of the National Audit of Small Bowel Obstruction.
3. Hwang J, Lee J et al. 2009. Value of multidetector CT in decision making regarding surgery in patient with small bowel obstruction due to adhesion. *European Radiology*, 19(10): 2425-31
4. Association of Coloproctology of Great Britain and Ireland. 2017. Emergency General Surgery Sub-Committee. Recommendations for the management of large bowel obstruction.

5. National Institute for Health and Clinical Excellence. 2001. Colorectal Cancer Information for the public. <https://www.nice.org.uk/guidance/cg131/ifp/chapter/About-this-information>
6. National Emergency Laparotomy Audit. Last accessed May 2018. <http://www.nela.org.uk/>
7. Ripamonti, C., & Bruera, E. 2002. Palliative management of malignant bowel obstruction. *Gynecol Cancer*, 12(2): 135-43.
8. Abbas S, Bisset IP, Parry BR. 2007. Oral water soluble contrast for the management of adhesive small bowel obstruction. *Cochrane Database Syst Rev*.
9. Finan P et al. 2007. The management of malignant large bowel obstruction: ACPGBI Position Statement.
10. Johnson R, Marsh R et al. 2004. A Comparison of two methods of palliation of large bowel obstruction due to irremovable colon cancer. *Ann R Coll Surg Eng*, 86(2): 99-103.
11. Khot U, Lang A et al. 2002. Systematic review of the efficacy and safety of colorectal stents. *Br J Surg*, 89(9): 1096-102.
12. Atukorale YN. 2016. Self-expanding Metallic Stents, for the Management of Emergency Malignant Large Bowel Obstruction: a Systematic Review. *J Gastrointest Surg*, 20(2): 455-62
13. Cirocchi R, Abraha F et al. 2010. Laparoscopic verses open surgery in small bowel obstruction. *Cochrane Database Syst Rev*, 17(2).
14. Saunders DI, Murray D et al on behalf of the members of the UK Emergency Laparotomy Network. 2012. Variations in mortality after emergency laparotomy: the first report of the UK Emergency Laparotomy Network. *British Journal of Anaesthesia*, 109(3): 368-375.