

Guidelines for Intestinal Obstruction Management

Acknowledgement:

We would like to acknowledge the Guideline General Surgery, (GGS) committee for developing this guideline.

Chair of GGS: Mostafa Abdel-Hamed Soliman, Professor of Surgery, Cairo University.

Moderator of GGS: Mohamed Ali Mohamed Nada, Professor of Surgery, Ain Shams University.

Members of GGS (Alphabetically):

Abel-Motey Hussein Aly, Professor of Surgery, Cairo University.

Abdel-Wahab Mohamed Ezzat, Professor of Surgery, Ain Shams University.

Ahmed Abdel-Raouf Elgeidie, Professor of Digestive Surgery, Mansoura University.

Alaa Abdallah, Professor of Surgery, Ain Shams University.

Atef Abdel-Ghani Salem, Professor of Surgery, Benha University.

Hesham Abdel-Raouf El-Akkad, Professor of Surgery, Ain Shams University.

Ibrahim El-Zayat, Head of Surgery Department, Aswan University.

Khaled Abdallah El-Fiky, Professor of Surgery, Ain Shams University.

Khaled Amer, Professor of Surgery, Military Medical Academy.

Khaled Safwat, Professor of Surgical Oncology and Endoscopy, Zagazig University.

Mohamed Ibrahim Abdel-Hamed Al-Said, Professor of Surgery, Zagazig University.

Tarek Ibrahim, Professor of Surgery, National Liver Institute, Menofia University.

Contents:

Contents	2
Abbreviations	2
Executive Summary	2
Introduction	4
Scope and Purpose	4
Target audience	5
Methods	5
Recommendations	6
Research Needs	8
Clinical Indicators for monitoring	8
Updating of the Guideline	8
Annexes	9
References	11

Abbreviations:

AGREE II	Appraisal of Guidelines for Research and Evaluation II
ASBO	Adhesive Small Bowel Obstruction
ACPO	Acute Colonic Pseudo-Obstruction
CT	Computerized Tomography.
GGS	Guideline General Surgery
GRADE	Grading of Recommendations, Assessment, Development and Evaluation
ICU	Intensive Care Unit
LBO	Large Bowel Obstruction
NGT	Naso-Gastric Tube
SBO	Small Bowel Obstruction
WHO	World Health Organization

Executive Summary:

This guideline offers evidence-based recommendations on the targeted levels of Clinical practice guidelines and provide healthcare professionals with practical guidance on the diagnosis and treatment of acute intestinal obstruction.

- We recommend depending on initial evaluation which include a focused history, physical examination, and basic laboratory assessment, (Strong Recommendation).
- Initial evaluation should be complemented with assessment of the laboratory tests evaluating at least blood count, lactate, and electrolytes, CRP and BUN/Creatinine, (Good Practical Statement).
- Plain X-rays may be recommended in the work-up of patients with small bowel obstruction, (Conditional Recommendation).

- Optimal diagnostic work-up should include CT scan with water soluble oral contrast in the assessment, (Strong Recommendation).
- Ultrasound may be recommended in children in special situations, (Conditional Recommendation).
- MRI may be recommended in recurrent intestinal obstruction, (Conditional Recommendation).
- In the absence of the need to perform immediate surgery, we recommend a follow-up abdominal X-ray after 24 h. (If the contrast has reached the colon, this is indicative for resolution of the bowel obstruction), (Strong Recommendation).
- Colonoscopy may be recommended in LBO to identify tumors, strictures or volvulus, (Conditional Recommendation).
- A trial of non-operative management can be recommended safely for 72 hours, (Conditional Recommendation).
- In the absence of signs that require emergent surgical exploration (i.e., peritonitis, strangulation, or bowel ischemia), non-operative management is recommended, (Conditional Recommendation).
- We recommend the use of naso-gastric tubes or long trilumen naso-intestinal tubes in non-operative management, (Strong Recommendation).
- We recommend conservative treatment for postoperative (paralytic) ileus after abdominal surgery, by implementation of enhanced recovery measures that include early oral feeding, minimizing opioid analgesics and early mobilization, (Good Practical Statement).
- We recommend exploration for patients with plain film or CT finding of SBO and clinical markers, (fever, leukocytosis, tachycardia, metabolic acidosis and continuous pain) or peritonitis on physical examination, (Strong Recommendation).
- We recommend Laparoscopic or open adhesiolysis for treatment of adhesive SBO, (Strong Recommendation).
- We recommend hernia repair with bowel resection for strangulated hernia, (Strong Recommendation).
- We recommend lower endoscopy for patients with sigmoid volvulus and without hemodynamic instability, peritonitis, or evidence of perforation to assess sigmoid colon viability, detorse the anatomy, and decompress the colon, (Conditional Recommendation).
- We recommend urgent sigmoid resection when endoscopic detorsion of the sigmoid colon fails and in cases of nonviable or perforated colon, (Strong Recommendation).
- Patients who undergo successful endoscopic detorsion should be considered for sigmoid colectomy during the same hospital admission to prevent recurrent volvulus, (Strong Recommendation).
- Endoscopic or operative fixation of the sigmoid colon may be recommended in selected patients in whom operative intervention presents a prohibitive risk, (Conditional Recommendation).
- Segmental resection is the recommended treatment for patients with cecal volvulus, (Strong Recommendation).

- We recommend emergency resection with anastomosis or diverting colostomy for patients with acute on top of chronic intestinal obstruction due to colonic cancer, (Strong Recommendation).
- Initial evaluation of ACPO should include a focused history and physical examination, baseline laboratory tests, and diagnostic imaging, (Strong Recommendation).
- We recommend supportive treatment for ACPO which includes eliminating or correcting conditions that predispose patients to ACPO or prolong its course (e.g. immobility, neurological disorders, etc.), (Strong Recommendation).
- Pharmacologic treatment with neostigmine is recommended when ACPO does not resolve with supportive therapy, (Strong Recommendation).
- Endoscopic colonic decompression is recommended in patients with ACPO in whom neostigmine therapy is contraindicated or ineffective, (Strong Recommendation).
- Operative treatment is recommended for ACPO complicated by colon ischemia or perforation or ACPO refractory to pharmacologic and endoscopic therapies, (Conditional Recommendation).

Introduction:

Intestinal obstruction is a critical surgical emergency that requires timely and effective management to prevent complications such as ischemia, perforation, sepsis, and mortality. Acute intestinal obstruction occurs when a mechanical obstruction disrupts or blocks the normal movement of intestinal contents. It is estimated to affect 2% to 8% of patients who visit the emergency department. While the rates of morbidity and mortality related to acute intestinal obstruction have decreased, managing the condition remains complex. The choice between non-operative management and surgical intervention should be made cautiously by skilled healthcare providers, ⁽¹⁾. The primary causes of acute intestinal obstruction are adhesions, neoplasms, and herniation. Adhesions, typically resulting from previous abdominal surgeries, are the leading cause of small bowel obstruction (SBO), responsible for 60% to 75% of cases. Lower abdominal and pelvic surgeries, such as appendectomy, colorectal, gynecologic surgeries, and hernia repairs, carry a higher risk of adhesive SBO. Obstructions caused by neoplasms are uncommon and are more frequently seen in the large bowel. Other potential causes include inflammatory bowel disease, intestinal intussusception, volvulus, intra-abdominal collections, gallstones, and foreign bodies, ⁽²⁾. This document serves as a comprehensive guideline for surgeons, providing an evidence-based approach to the classification, diagnosis, and treatment of intestinal obstruction.

Scope and Purpose:

The scope of this guideline is to set recommendations for the diagnose and treatment of acute intestinal obstruction.

The main purpose of these guidelines is to minimize malpractice and poor surgical decision, to improve the quality of medical care and surgical service, to provide the good surgical practice to our patients, and finally to be cost effective.

Target Audience:

The principle targeted candidates are the practicing surgeons, however endoscopists, radiologists, ICU specialists and nursing staff may be included.

Methods:

A comprehensive search for guidelines was undertaken to identify the relevant guidelines to consider for adaptation.

Inclusion/ exclusion criteria followed in the search and retrieval of guidelines to be adapted:

- Selecting only evidence-based guidelines (guideline must include a report on systematic literature searches and explicit links between individual recommendations and their supporting evidence)
- Selecting only national and/or international guidelines
- Specific range of dates for publication (using Guidelines published or updated in 2015 and later)
- Selecting peer reviewed publications only
- Selecting guidelines written in English language
- Excluding guidelines written by a single author, not on behalf of an organization to be valid and comprehensive, a guideline ideally requires multidisciplinary input
- Excluding guidelines published without references as the panel needs to know whether a thorough literature review was conducted and whether current evidence was used in the preparation of the recommendations

The following characteristics of the retrieved guidelines were summarized in:

- Developing organization/authors
- Date of publication, posting, and release
- Country/language of publication
- Date of posting and/or release
- Dates of the search used by the source guideline developers

All retrieved Guidelines were screened and appraised using AGREE II instrument (www.agreetrust.org) by at least three members. The panel decided on a cut-off point or ranked the guidelines (any guideline scoring above 50% on the rigor dimension was retained). The GGS decided to adapt the Bologna guidelines for diagnosis and management of adhesive small bowel obstruction (ASBO): 2013 update of the evidence-based guidelines from the World Society of Emergency Surgery ASBO Working Group and guidelines for management of small bowel obstruction, 2008.

Evidence assessment

According to WHO Handbook for Guidelines, we used the GRADE (Grading of Recommendations, Assessment, Development and Evaluation) approach to assess the quality of a body of evidence, develop and report recommendations. GRADE methods are used by WHO because these represent internationally agreed standards for making transparent recommendations. Detailed GRADE information is available on the following sites:

- GRADE working group: <http://www.gradeworkinggroup.org>
- GRADE online training modules: <http://cebgrade.mcmaster.ca/>
- GRADE profile software: <http://ims.cochrane.org/revman/gradepro>

Specifically, the quality of evidence was graded as ‘High’, ‘Moderate’, ‘Low’ or ‘Very low’, (table 1& 2).

The strength of the recommendation

The strength of a recommendation communicates the importance of adherence to the recommendation.

Strong recommendations

With strong recommendations, the guideline communicates the message that the desirable effects of adherence to the recommendation outweigh the undesirable effects. This means that in most situations the recommendation can be adopted as policy.

Conditional recommendations

These are made when there is greater uncertainty about the four factors above or if local adaptation has to account for a greater variety in values and preferences, or when resource use makes the intervention suitable for some, but not for other locations. This means that there is a need for substantial debate and involvement of stakeholders before this recommendation can be adopted as policy.

When not to make recommendations

When there is lack of evidence on the effectiveness of an intervention, it may be appropriate not to make a recommendation.

Recommendations:

Section I. Clinical Diagnosis of Intestinal Obstruction:

- We recommend depending on initial evaluation which include a focused history, physical examination, and basic laboratory assessment, (Strong recommendation, low certainty evidence, ⁽³⁾).

Section II. Laboratory Work-Up for Intestinal Obstruction:

- Initial evaluation should be complemented with assessment of the laboratory tests evaluating at least blood count, lactate, electrolytes, CRP and BUN/Creatinine, (Good practical statement).

Section III. Diagnostic imaging for Intestinal Obstruction:

- Plain X-rays may be recommended in the work-up of patients with small bowel obstruction, (Conditional recommendation, low certainty evidence, ⁽⁷⁾).
- Optimal diagnostic work-up should include CT scan with water soluble oral contrast in the assessment, (Strong recommendation, moderate certainty evidence, ⁽⁷⁾).
- Ultrasound may be recommended in children in special situations, (Conditional

recommendation, low certainty evidence, ⁽⁷⁾).

- MRI may be recommended in recurrent intestinal obstruction, (Conditional recommendation, low certainty evidence, ⁽⁷⁾).
- In the absence of the need to perform immediate surgery, we recommend a follow-up abdominal X-ray after 24 h. (If the contrast has reached the colon, this is indicative for resolution of the bowel obstruction), (Strong recommendation, moderate certainty evidence, ⁽⁷⁾).
- Colonoscopy may be recommended in LBO to identify tumors, strictures or volvulus, (Conditional recommendation, low certainty evidence, ⁽⁷⁾).

Section IV. Conservative (Non-Operative) Management, (Figure 1)⁽⁸⁾:

- A trial of non-operative management can be recommended safely for 72 hours, (Conditional recommendation, moderate certainty evidence, ⁽⁷⁾).
- In the absence of signs that require emergent surgical exploration (i.e., peritonitis, strangulation, or bowel ischemia), non-operative management is recommended, (Conditional recommendation, low certainty evidence, ⁽⁷⁾).
- We recommend the use of naso-gastric tubes or long trilumen naso-intestinal tubes in non-operative management, (Strong recommendation, high certainty evidence, ⁽⁷⁾).
- We recommend conservative treatment for postoperative (paralytic) ileus after abdominal surgery, by implementation of enhanced recovery measures that include early oral feeding, minimizing opioid analgesics and early mobilization, (Good practical statement).

Section V. Surgical management:

- We recommend exploration for patients with plain film or CT finding of SBO and clinical markers, (fever, leukocytosis, tachycardia, metabolic acidosis and continuous pain) or peritonitis on physical examination, (Strong recommendation, high certainty evidence, ⁽⁷⁾).
- We recommend Laparoscopic or open adhesiolysis for treatment of adhesive SBO, (Strong recommendation, high certainty evidence, ⁽⁷⁾).

Section VI. Special considerations:

- We recommend hernia repair with bowel resection for strangulated hernia, (Strong recommendation, high certainty evidence, ⁽⁷⁾).
- We recommend lower endoscopy for patients with sigmoid volvulus and without hemodynamic instability, peritonitis, or evidence of perforation to assess sigmoid colon viability, detorse the anatomy, and decompress the colon, (Conditional recommendation, low certainty evidence, ⁽³⁾).
- We recommend urgent sigmoid resection when endoscopic detorsion of the sigmoid colon fails and in cases of nonviable or perforated colon, (Strong recommendation, moderate certainty evidence, ⁽³⁾).
- Patients who undergo successful endoscopic detorsion should be considered for sigmoid colectomy during the same hospital admission to prevent recurrent volvulus, (Strong recommendation, moderate certainty evidence, ⁽³⁾).
- Endoscopic or operative fixation of the sigmoid colon may be recommended in selected patients in whom operative intervention presents a prohibitive risk, (Conditional

recommendation, low certainty evidence, ⁽³⁾).

- Segmental resection is the recommended treatment for patients with cecal volvulus, (Strong recommendation, moderate certainty evidence, ⁽³⁾).
- We recommend emergency resection with anastomosis or diverting colostomy for patients with acute on top of chronic intestinal obstruction due to colonic cancer, (Strong recommendation, moderate certainty evidence, ⁽⁷⁾).

Section VII. Acute colonic pseudo-obstruction:

- Initial evaluation of ACPO should include a focused history and physical examination, baseline laboratory tests, and diagnostic imaging, (Strong recommendation, moderate certainty evidence, ⁽³⁾).
- We recommend supportive treatment for ACPO which includes eliminating or correcting conditions that predispose patients to ACPO or prolong its course (e.g. immobility, neurological disorders, etc.), (Strong recommendation, moderate certainty evidence, ⁽⁷⁾).
- Pharmacologic treatment with neostigmine is recommended when ACPO does not resolve with supportive therapy, (Strong recommendation, moderate certainty evidence, ⁽⁷⁾).
- Endoscopic colonic decompression is recommended in patients with ACPO in whom neostigmine therapy is contraindicated or ineffective, (Strong recommendation, moderate certainty evidence, ⁽⁷⁾).
- Operative treatment is recommended for ACPO complicated by colon ischemia or perforation or ACPO refractory to pharmacologic and endoscopic therapies, (Conditional recommendation, low certainty evidence, ⁽⁷⁾).

Research Needs:

1. Non operative management of SBO.
2. Management of ACPO.

Clinical Indicators for Monitoring:

1. Documentation of symptoms and signs of ABO.
2. CBC, Serum electrolytes, lactate.
3. CT.
4. Documentation of the type of treatment, (Non-operative, endoscopic, operative).

Updating of the Guideline:

The GGS committee for guidelines development is responsible for the continuous evaluation of evidence available about acute intestinal obstruction. The present guidelines will be updated in case of significant changes based on new evidence.

Annexes:

Table 1 Quality and Significance of the four levels of evidence in GRADE

Quality	Definition	Implications
High	The guideline development group is very confident that the true effect lies close to that of the estimate of the effect	Further research is very unlikely to change confidence in the estimate of effect
Moderate	The guideline development group is moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate
Low	Confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the true effect	Further research is very likely to have an important impact on confidence in the estimate of effect and is unlikely to change the estimate
Very low	The group has very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect	Any estimate of effect is very uncertain

Table 2 factors that determine How to upgrade or downgrade the quality of evidence

Downgrade in presence of	Upgrade in presence of
Study limitations -1 Serious limitations -2 Very serious limitations	Dose-response gradient +1 Evidence of a dose-response gradient
Consistency -1 Important inconsistency	Direction of plausible bias +1 All plausible confounders would have reduced the effect
Directness -1 Some uncertainty -2 Major uncertainty	Magnitude of the effect +1 Strong, no plausible confounders, consistent and direct evidence
Precision -1 Imprecise data	+2 Very strong, no major threats to validity and direct evidence
Reporting bias -1 High probability of reporting bias	

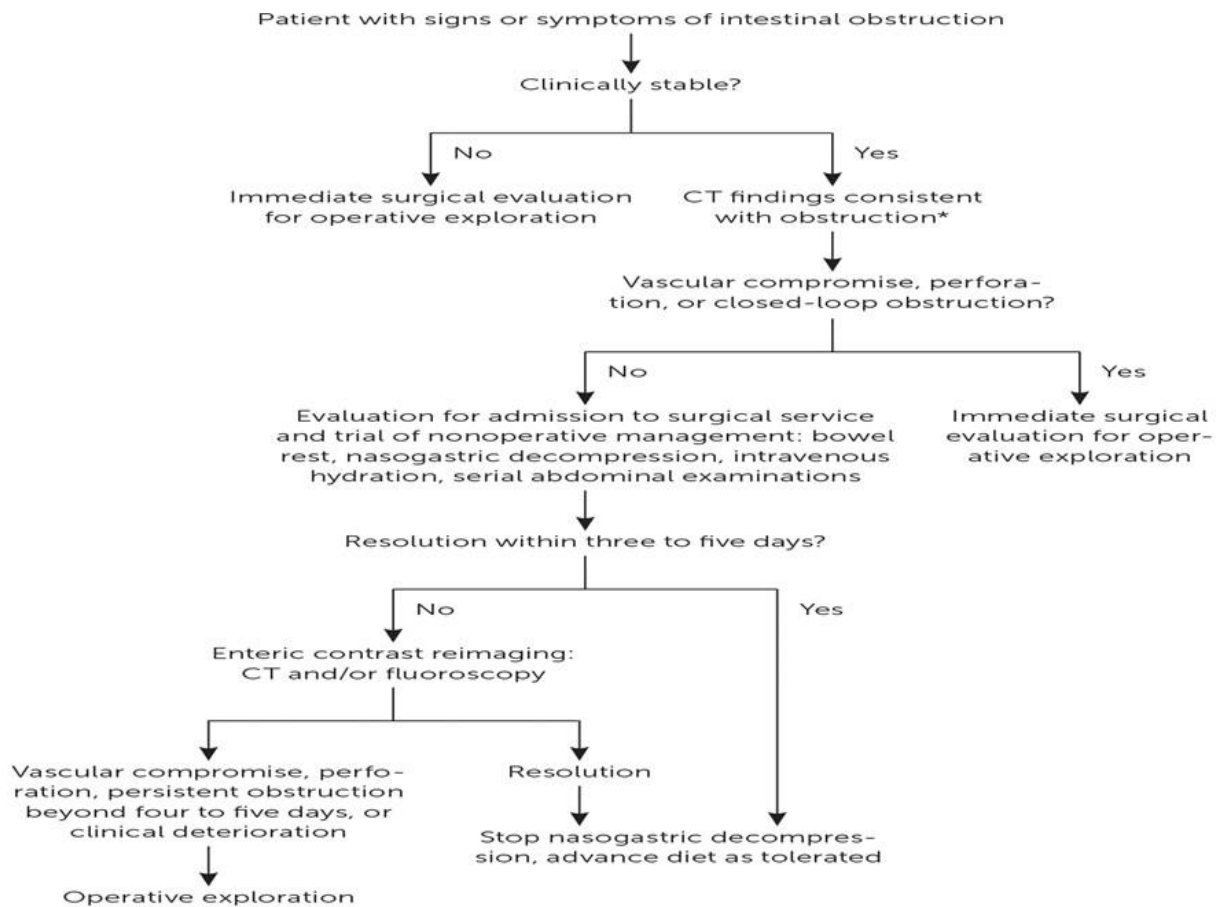
Table 3 Causes of intestinal obstruction, (1, 4, 6)

1. Adhesive disease	60- 75%
2. Neoplasm	13- 20%
3. Herniation	2- 15%
4. Inflammatory bowel disease	5- 7%
5. Volvulus	<5%
6. Others	5- 7%

Table 4 Differential diagnosis of intestinal obstruction

Diagnosis	Clues
Medication adverse effects (diagnosis of exclusion)	Review of medication (tricyclic antidepressant, narcotics, etc)
Mesenteric ischemia	History of peripheral vascular disease or postprandial abdominal angina, hypercoagulable state recent use of vasopressor
Perforated viscus Intra-abdominal sepsis	Ever, leukocytosis, peritonitis pneumoperitoneum
Post-operative paralytic ileus	Recent abdominal surgery with no post-operative flatus or bowel movement
Pseudo-obstruction (Ogilvie syndrome)	Acutely dilated large intestine, Diabetes Mellitus, history of intestinal dysmotility, scleroderma

Figure 1 Management of acute intestinal obstruction⁽⁸⁾



*—Abdominal radiography is an appropriate initial examination in patients with suspected intestinal obstruction, especially in those unable to undergo cross-sectional imaging or who are hemodynamically unstable or have equivocal clinical findings.

References:

1. Jackson P, Vigiola Cruz M. Intestinal Obstruction: Evaluation and Management. *Am Fam Physician*. 2018 Sep 15;98(6):362-367. PMID: 30215917.
2. Taylor MR, Lalani N. Adult small bowel obstruction. *Acad Emerg Med*. 2013; 20(6):528-544.
3. Di Saverio S, Coccolini F, Galati M, et al. Bologna guidelines for diagnosis and management of adhesive small bowel obstruction (ASBO): 2013 update of the evidence-based guidelines from the World Society of Emergency Surgery ASBO Working Group. *World J Emerg Surg*. 2013
4. Leung AM, Vu H. Factors predicting need for and delay in surgery in small bowel obstruction. *Am Surg*. 2012;78(4):403-407.
5. ten Broek RP, Issa Y, van Santbrink EJ, et al. Burden of adhesions in abdominal and pelvic surgery: systematic review and meta-analysis. *BMJ*. 2013; 347:f5588.
6. Branco BC, Barmparas G, Schnüriger B, Inaba K, Chan LS, Demetriades D. Systematic review and meta-analysis of the diagnostic and therapeutic role of water-soluble contrast agent in adhesive small bowel obstruction. *Br J Surg*. 2010;97(4):470-478.
7. Diaz JJ Jr, Bokhari F, Mowery NT, Acosta JA, Block EF, Bromberg WJ, Collier BR, Cullinane DC, Dwyer KM, Griffen MM, Mayberry JC, Jerome R. Guidelines for management of small bowel obstruction. *J Trauma*. 2008 Jun; 64(6):1651-64. doi: 10.1097/TA.0b013e31816f709e. PMID: 18545135.
8. Jackson PG and Raiji M. Evaluation and management of intestinal obstruction. *American Family Physician*. 2011; 83 (2): 159- 165