

Management of Type 2 (Medium Term Reversible) Intestinal Failure

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Type 2 intestinal failure is usually a reversible form of intestinal failure (IF) that lasts more than 28 days. It commonly arises as a consequence of abdominal sepsis and enterocutaneous fistula(s), bowel obstruction/ileus and may be associated with metabolic problems. A useful mnemonic for managing type 2 IF is 'SNAP', standing for Sepsis, Nutrition, Anatomy (i.e. mapping) and planned Procedure. This top tips article retains this principle but expands upon it.

Key points

1. Type 2 IF should be managed by an experienced and adequately resourced multidisciplinary team ideally in a designated centre.
2. **Immediate management** starts with resuscitation/fluid balance, detection and treatment of sepsis (the main cause of mortality), analgesia, wound and (where appropriate) stoma management.
3. **Initial management** in the following 1-2 days consists of starting nutritional support taking the risk of refeeding syndrome into account. The decision for oral/enteral nutrition (EN) or parenteral nutrition (PN) depends upon the stage of development/status of the fistula and length of proximal small bowel. Oral/EN may be given if chyme is not draining into an abscess cavity, and it may be effective if there is sufficient proximal (in circuit) normally functioning small bowel for absorption (generally more than 100 cm).
4. Once the output from a stoma or fistula has reduced, psychosocial issues start to be addressed and the patient's mobility improved.
5. Up to 50% of all post-operative fistula(s) will heal spontaneously (usually within 6 weeks).
6. **Later management** is when the patient has stabilized (usually after 2-12 weeks). It consists of mapping the remaining bowel (radiological contrast studies) and treating any underlying bowel disease (e.g. immunosuppressant therapy for Crohn's disease) before undertaking elective reconstructive surgery. Reconstructive surgery should be undertaken at least 100 days after the last operation and, in the case of a patient with an open abdomen or enterocutaneous fistula, not before 6 months.
7. Safe delivery of PN over many months should ensure that patients are fit enough for definitive reconstructive surgery. Many patients will go home for a period of PN before this. They must be advised to stop smoking and, if diabetic, have good blood glucose control.
8. Complete or trophic distal feeding of EN (and/or chyme) may be given preoperatively into defunctioned distal bowel.

Figure 1

A practical blank worksheet to summarise the diagnosis, problems and anatomy of a patient with intestinal failure

Intestinal Failure

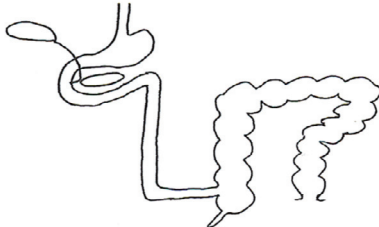
Name:
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Main diagnoses:

Abdominal surgery: Date(s):

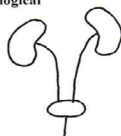
ANATOMY

Remaining small bowel length: cm

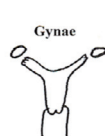


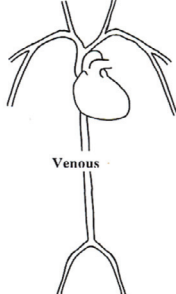


Urological



Gynae





Venous

Other problems:

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Explanations

1. The vast majority of these patients present to and are managed in non-specialised units. A nutrition support team (NST) must work closely with the surgical team pending referral to specialised intestinal failure services. The European Society for Clinical Nutrition and Metabolism (ESPEN) defines type 2 intestinal failure as a *'prolonged acute condition, often in metabolically unstable patients, requiring complex multi-disciplinary care and intravenous supplementation over periods of weeks or months'*.
2. Although fluid management, pain relief and wound care all need immediate attention, sepsis is the main cause of death in such patients and so must be suspected, detected and treated. This may require drainage (interventional radiology or surgery) and appropriate antibiotics (including antifungals). Sepsis may be suspected in patients with an elevated temperature (often absent if very malnourished), tachycardia, raised inflammatory markers (white cell count, platelets, c-reactive protein [CRP] and ferritin). Many patients do not present with the usual markers of acute infection and a low serum albumin, abnormal liver function tests (jaundice), hyponatraemia, hypophosphatemia or a body weight/muscle mass that is not increasing with nutritional support should raise suspicion of sepsis. A low threshold for cross-sectional imaging (preferably with intravenous and positive enteral contrast) in the early stages of IF is advised.
3. The decision regarding whether to give oral/EN or PN can be difficult. In the past, all patients were initially fed parenterally and were nil by mouth. However, this may not always be necessary if a fistula is draining externally without bowel content collecting, or if the proximal gut is functional (and in circuit) and of more than 100 cm in length. Most commonly an enterocutaneous fistula is through an anterior abdominal wall defect and there is no associated collection so, if more than 100 cm functioning small bowel is known or thought to be present upstream the patient may be fed orally/enterally. A deeper intra-abdominal leak/fistula is more likely to initially have an associated abscess cavity and such patients will usually need PN. If a patient is fed by oral/EN and becomes septic or has evidence of an abscess, all enteral intake should be stopped (nil by mouth) and PN begun. Following drainage of an abscess cavity or once luminal contents drain without collecting, then oral/EN may be restarted. If the functional bowel length proximal to a fistula is short (less than 100 cm) then parenteral support will be needed, even if there is no abscess cavity.
4. A high stoma/fistula output is treated in the usual way with restricted oral hypotonic fluid, sipping a glucose-saline solution and antimotility (e.g. loperamide, codeine phosphate) and antisecretory drugs (e.g. proton pump inhibitors). Although octreotide has the advantage of reducing pancreatico-biliary and gastric acid secretions, it does not reduce stomal/fistula output more than a proton pump inhibitor, and it does not result in the closure of a fistula which would not otherwise close spontaneously, so is now rarely, if ever, indicated. Additionally, octreotide does predispose to gallstone formation and may impair intestinal adaptation. The patient's psychological status should be addressed and mobility optimised before reconstructive surgery is undertaken.
5. Postoperative enterocutaneous fistulas will heal spontaneously in many patients however this is unlikely to occur if there is distal bowel obstruction, active disease (e.g. Crohn's, malignancy), continuing sepsis at the fistula site, discontinuity of the bowel ends, visible bowel mucosa, very short fistula tract, or multiple fistulas.
6. Contrast studies are undertaken to determine if proximal and distal defunctioned bowel are normal with no strictures or leaks, to determine approximate bowel lengths and to define the anatomy of fistulation (including unrecognised internal fistulas). Cross sectional imaging provides important preoperative information regarding abdominal wall defects. A diagram summarising the history and current anatomy may be helpful (**Figure 1**).
7. Prior to surgery the patient should be optimised to reach an agreed target nutritional status (weight) and have improved their mobility. They should be entirely free from sepsis. An open abdomen should have largely re-epithelialised. Enterocutaneous fistulas and stomas will often prolapse externally as the peritoneal cavity is being re-established. Preoperative anaesthetic assessment is essential and chronic pain management should be optimised as postoperative pain can be difficult to manage. Surgery for enterocutaneous fistula(s) is best delayed for at least 6 months after the last procedure. Premature reconstructive surgery is associated with excessive risk of mortality and fistula recurrence. Surgical strategy should involve production of a plan for both the intestinal tract and, where appropriate, the abdominal wall. Surgery may be technically challenging, requiring an adequately resourced and experienced team, and is frequently best undertaken in more than one operation.
8. Distal feeding can be given via a distal mucus fistula or enterocutaneous fistula via a catheter and may be for trophic feeding (when it is insufficient to replace PN) or complete distal feeding (replacing PN). The benefits of distal feeding include improving the quality of bowel for surgical reconstruction, improving liver function, decreasing stoma or fistula output and, in some cases, enabling patients to stop PN.

Suggested reading:

- Farrer K, Culkun A, Small M, Nightingale J and the BIFA Committee. Top Tips for Distal Enteral Tube Feeding. BAPEN 2020: www.bapen.org.uk/pdfs/bifa/bifa-top-tips-series-9.pdf
- Nightingale JMD. How to manage a high-output stoma. *Frontline Gastroenterol.* 2021; doi:10.1136/flgastro-2018-101108 (Epub ahead of print).
- Pironi L, et al. ESPEN endorsed recommendations. Definition and classification of intestinal failure in adults. *Clin Nutr.* 2015; 34: 171-180
- Soop M, Monson JRT, Carlson G. Intestinal failure. In: Keighley and Williams' surgery of the anus, rectum and colon. 4th Edition, Eds. Sagar PM, Hill G, Knowles CH, Post S, Bemelman WA, Roberts PL, Galandiuk S and Monson JRT. CRC Press. Boca Raton. 2019; 1450-1477.