3 Surgical Management

3.1 Access

3.1.1 Waiting times

The Department of Health published national referral guidelines in 2000 for suspected cancers, based on high-risk symptoms and signs, the so-called ‘2 week rule’. The recommendation was that units should see in excess of 95% of referrals within 2 weeks. This recommendation has successfully improved service delivery and patient processing within the NHS, although evidence of improved outcomes is unproven (Hitchins et al., 2014; Patel et al., 2014; Schneider et al., 2015).

In 2005, the NHS National Cancer Plan produced treatment targets for colorectal cancer, consisting of 62 days from ‘2 week’ referral and 31 days from the ‘decision to treat date’ (Department of Health, 2006). However, the health service’s primary emphasis should be on quality and outcomes, rather than on time to treatment (Murchie et al., 2014).

Treatment should begin within 31 days of the decision to treat.

Recommendation grade D

3.1.2 The multidisciplinary team (MDT)

A colorectal cancer MDT serving a population of 200 000 is expected to manage around 120 new cases of colorectal cancer each year. Each of these cases should be discussed at a MDT meeting with the aim of reaching a consensus regarding the best management plan for each patient (National Institute for Health and Care Excellence, 2014a; National Institute for Health and Care Excellence, 2014b).
patients per year. Quality cancer treatment depends on coordination between multiple treatments and treatment providers, the exchange of technical information, and effective communication between clinical, nursing and other disciplines involved in the patients’ management. Multidisciplinary teams (MDTs) should improve coordination, communication, and decision making between health-care team members and patients, and produce better outcomes. This can be achieved by reflective practice, audit, patient surveys, MDT ‘away days’ to develop the service delivered. Feedback should be systematically evaluated and any changes made to the care for both the general patient population and for individual patients, should be subsequently reviewed and evaluated by the team to see if improvement has been achieved. Despite the standardization of delivery of cancer services via this method, research showing the effectiveness of MDT working is scarce (Fennell et al., 2014; Fleissig et al., 2006).

The ACPGBI ‘Resources for Coloproctology 2015’ document (Association of Coloproctology of Great Britain and Ireland, 2015) informs clinicians, managers, medical directors, chief executives and politicians, to address any existing inequalities in care for patients and achieve uniform standards nationally.

The core colorectal MDT should include:
- Specialist surgeons (at least 2)
- Clinical oncologist
- Medical oncologist
- Diagnostic radiologist with gastrointestinal expertise
- Histopathologist
- Colonoscopist (surgeon, physician or specialist nurse)
- Clinical nurse specialist (CNS)
- Clinical trials co-ordinator or research nurse
- Palliative care specialist (doctor or nurse)
- MDT co-ordinator
- Administrative support (including data manager)

The extended MDT members should include:
- Gastroenterologist
- Liver surgeon
- Thoracic surgeon
- Interventional radiologist
- Dietician
- Liaison psychiatrist/clinical psychologist
- Social worker
- Clinical geneticist
- Specialist screening practitioner (SSP)
- Clinician with expertise in colonic stenting

The management plans for all colorectal cancer patients should be reviewed by a Colorectal MDT.

3.1.3 Surgical specialization

There have been a number of reports assessing effects of surgical specialization and patient throughput (both the number of cases treated per surgeon and per hospital) on outcomes in colorectal cancer (Etzioni et al., 2014). The NICE colorectal cancer guidance (2004) identified 6 systematic reviews and 28 other studies in this field. The evidence indicates that better surgical specialization and training is associated with improved outcomes, particularly in rectal cancer (Archampong et al., 2012; Etzioni et al., 2014).

These benefits of surgical specialization appear more pronounced for rectal cancer than for colon cancer. In rectal cancer, 11 of 13 studies reported that more specialized surgeons achieved better outcomes. Six out of eight good quality studies showed significant effects on one or more of the following measures; survival rates (up to 5 years), quality of surgery (assessed by complication rates or tumour-free excision margins) and local recurrence rates (Archampong et al., 2012). Greater specialization is also associated with shorter in-patient stay and less frequent use of stomas (National Institute for Health and Clinical Excellence, 2004).

It is advised that each surgeon in the MDT should ideally carry out a minimum of 20 radical colorectal cancer resections per annum (The Association of Coloproctology of Great Britain and Ireland, 2012).

Surgery for colorectal cancer should be performed by surgeons with appropriate training and experience, working within an MDT.

Recommendation grade B

3.1.4 Role of the colorectal clinical nurse specialist (CNS)

The 2000 NHS Cancer Plan (Department of Health, 2000) initially highlighted the important role of the CNS within the pathway for cancer patients. The initial paper stressed that CNSs were needed to provide psychological support but subsequent papers acknowledge the wider contribution to the overall quality and effectiveness of patients’ cancer management (Department of Health, 2011a). National cancer patient surveys demonstrate that by having access to a CNS, patients’ cancer experiences are much better co-ordinated, leading to better outcomes (Quality Health.).

The colorectal CNS works autonomously and uses their training and experience of colorectal cancer to assist patients with their concerns and problems, whilst they are undergoing assessment, diagnosis, treatment and follow up of their disease. The CNS is seen as the
key worker or patient advocate and is the person within the MDT who is most accessible to patients, working closely with them and their families/carers to provide information and constant support at each stage of their care (National Cancer Action Team, 2010). Their role is pivotal to coordinate access to different services and clinicians during individual patients’ clinical journey.

As well as being a clinical expert within colorectal cancer, the CNS should possess a first level degree and have completed or is working towards, post-registration learning, specific to their specialism and role, such as advanced communication skills, leadership, management, teaching and research (Macmillan, 2015). The CNS will have a role in transforming patients’ experiences of cancer care by CNS-led activities such as improving quality and experience of care, reinforcing safety, increasing efficiency and demonstrating management and leadership (National Cancer Action Team, 2010).

3.2 Perioperative Care
The intention of treatment, whether curative, potentially curative or palliative should be discussed in the MDT and communicated to the patient and primary care team.

However, surgery for colorectal cancer should be avoided if the risks are deemed to outweigh the potential benefits, such as when the patient has major co-morbidity or the tumour is deemed unresectable. In this situation, a further opinion from another surgeon, or surgeons, or other relevant professionals, is encouraged if there are ongoing concerns about this decision in the mind of the surgeon, the patient, relatives or carers.

3.2.1 Optimization of co-morbidities and risk stratification
There is increasing need to consider colorectal cancer surgery in older and high-risk patients, who often have multiple and significant co-morbidities. Good preoperative preparation will reduce postoperative morbidity and mortality. Preoperative optimization should be considered in non-urgent surgery and should be initiated in the community with correction of anaemia, control of hypertension and diabetes and reduction or cessation of smoking and alcohol. Further optimization should take place at anaesthetic pre-admission assessment. The routine use of scoring systems such as ASA and POSSUM to evaluate operative risk is encouraged (Richards et al., 2010; Tekkis et al., 2003; Tekkis et al., 2004). Cardiopulmonary exercise (CPEX) testing should be considered for stratification of high-risk cases (Moran et al., 2016; West et al., 2014a; West et al., 2014b). However these stratification systems, though useful for large cohorts of patients, may be difficult to apply to individual patient risk and need to be interpreted with caution and by experienced surgeons and anaesthetists.

3.2.2 Informed decision making
Informed consent is the process of reaching a joint decision between the patient and the clinician(s), having discussed the recommended treatment and the likelihood of a successful outcome, the alternatives which may be available, providing clear information on the benefits and risks of the proposed and alternative treatments, the actual process of treatment and the implications of not having any treatment. A written record of consent, signed by the patient and the clinician should be the final part of this process. The UK Department of Health reference guide to consent for examination or treatment (Department of Health, 2009) and Consent: Supported Decision-Making (The Royal College of Surgeons of England, 2016) form the legal framework that health professionals need to take account of, in obtaining valid consent to examination, treatment or care.

It is recommended that the core members of the colorectal MDT should have received appropriate communication skills training. Patients should be offered a copy of their correspondence. Information regarding immediate recovery after surgery and enhanced recovery pathway should be provided.

The recognized morbidities associated with treatment should be fully discussed and documented, particularly, bleeding, infection, venous thromboembolism, anastomotic leak, and requirement for an unplanned stoma. Functional outcomes (bowel, urinary, sexual) following colorectal surgery should form part of the general discussion about the results and expectations of treatment.

A CNS should be available to provide support, assistance, information and advice to every patient and functioning as the ‘key worker’ or ‘case manager’. The CNS should have specific expertise in colorectal cancer including knowledge about, and mechanisms to access, stoma care, and be trained in communication skills and counselling.

Patients with colorectal cancer should meet and have access to a CNS as ‘Key Worker’ for advice and support from the time of their initial diagnosis.

**Recommendation grade C**

Patients should be offered written information, internet resources and copies of relevant correspondence.

**Recommendation grade C**
All patients undergoing surgery should have informed consent. Written consent should be obtained by the operating surgeon.

**Recommendation grade C**

### 3.2.3 Enhanced recovery after surgery (ERAS)

Enhanced recovery after surgery (ERAS) protocols are multimodal perioperative care pathways designed to achieve early recovery after surgical procedures by maintaining preoperative organ function and reducing the profound stress response incurred by surgery. For example, early introduction of diet and fluids within 24 h postoperatively has been shown to be safe and there is evidence that this may be beneficial (Lassen et al., 2009; Rawlinson et al., 2011; Spanjersberg et al., 2011). ERAS programs have been shown to be safe and effective, and increased implementation is justified (Zhuang et al., 2013). The majority of the evidence for ERAS implementation is in patients undergoing open colonic resection. The difference in ERAS principles between colonic resections and pelvic surgery are well recognized. These need to be tailored to individual cases when implemented in practice.

The essential principals of ERAS are as follows (Nygren et al., 2013):

1. Preoperative counselling and education
2. Preoperative medical optimization
3. Avoidance of oral mechanical bowel preparation
4. Preoperative carbohydrate drink, no overnight fasting
5. Standard anaesthesia management (premedication, pain control, PONV)
6. Antimicrobial and thromboembolism prophylaxis
7. Perioperative fluid management
8. Avoiding nasogastric and abdominal drains, early removal of urinary catheter
9. Preventing intraoperative hypothermia
10. Immediate postoperative diet
11. Early mobilization
12. Audit of practice and data collection

Peri-operative care in elective surgery should be based on ERAS principles.

**Recommendation grade A**

### 3.2.4 Preoperative fasting and carbohydrate loading

Preoperative administration of oral carbohydrate leads to reduced hospital stay and a trend towards earlier return of gut function (Noblett et al., 2006). Patients should receive a clear carbohydrate-rich beverage (12.6%) at a dose of 800 ml before midnight and 400 ml, 2–3 h before surgery. This reduces postoperative insulin resistance and maintains whole-body protein balance (Can et al., 2009; Yagci et al., 2008).

Preoperative carbohydrate loading should be considered in all patients undergoing elective colorectal cancer resection.

**Recommendation grade B**

### 3.2.5 Mechanical bowel preparation

Mechanical bowel preparation is not recommended in elective colon surgery. However this may not apply to anterior resection for rectal cancer. In patients undergoing restorative rectal cancer surgery, a randomized controlled trial showed a reduction of anastomotic and other septic complications with the use of mechanical bowel preparation (Bretagnol et al., 2010). However a subsequent Cochrane review reported that routine use of mechanical bowel preparation prior to elective colorectal resection does not benefit patients, in terms of reduction of anastomotic leaks or other complications and can be avoided (Guenaga et al., 2011).

Routine use of mechanical bowel preparation prior to elective colorectal cancer resection should be avoided.

**Recommendation grade B**

Mechanical bowel preparation may be beneficial in restorative procedures for rectal cancer.

**Recommendation grade B**

### 3.2.6 Stoma formation and training

The need for a permanent, or defunctioning, stoma should be discussed with the patient prior to surgery, especially in patients with advanced disease and/or left sided cancers. Information about the potential need for stoma formation and the practical, psycho-sexual and lifestyle implications of living with a stoma should be provided by a stoma specialist nurse in order to promote positive and realistic expectations in patients who may require stoma-forming surgery. Preoperative preparation includes providing patients with information and resources to help them to become familiar with equipment and procedures for stoma self-care. Gaining familiarity in stoma self-care preoperatively can reduce a patient’s length of stay through increased confidence and competence in the early postoperative period. (Danielsen et al., 2013).

Postoperative intensive inpatient support by ward nurses and the stoma specialist nurse to develop the skills, knowledge and confidence to become autonomous and independent in stoma self-care is also important, including understanding the potential...
complications. The stoma specialist nurse should help patients to develop positive coping strategies to promote independence and confidence-building. Preoperative stoma site marking is crucial for improving patients’ postoperative quality of life, promoting their independence and reducing the rates of complications (Baykara et al., 2014; Person et al., 2012).

Patients who may require a stoma should be counselled preoperatively and marked by a stoma care specialist. In an emergency situation, the stoma site should be marked by an experienced surgeon.

Recommendation grade B

3.2.7 Blood transfusion
Blood products may be required in the peri-operative management of colorectal cancer. There were previous concerns about potential increased risk of recurrence following peri-operative blood transfusion (McAlister et al., 1998). However a meta-analysis of three randomized, and two cohort studies, where control groups received either leucodepleted or autologous blood transfusion found no significant difference in cancer recurrence (Dionigi et al., 2007). Consent for blood transfusion should be obtained and documented in the clinical records (Department of Health, 2011b; Howell & Forsythe, 2011).

Patients should be consented for possible peri-operative blood transfusion. For elective colorectal resections, ‘group and save’ may be sufficient, but formal cross-matching is recommended for more extensive surgery.

Recommendation grade C

3.2.8 Thromboembolism prophylaxis
Patients undergoing surgery for colorectal cancer are at risk of venous thromboembolism (VTE) and prophylactic measures should be used. A combination of graduated compression stockings, intermittent pneumatic compression devices (Morris & Woodcock, 2010) and low molecular weight heparin (LMWH) should be used to reduce risk of VTE following surgery (National Institute for Health and Clinical Excellence, 2010b).

Patients undergoing pelvic surgery for malignancy should be considered for extended pharmacological VTE prophylaxis (National Institute for Health and Clinical Excellence, 2010b). The evidence for extended prophylaxis is contentious (Akl et al., 2008). If reduction in proximal deep venous thrombosis (DVT) is the aim, extending prophylaxis to 28 days postoperatively further reduces risk of proximal deep vein thrombosis (DVT) compared with peri-operative prophylaxis (National Institute for Health and Clinical Excellence, 2010b; Rasmussen et al., 2009).

A combination of graduated compression stockings, intermittent compression devices and LMWH should be used for VTE prophylaxis in patients undergoing surgery. Extended prophylaxis for 28 days postoperatively should be considered.

Recommendation grade B

3.2.9 Surgical site infection (SSI) prevention
Surgical site infections (SSI) impact on length of stay and unplanned readmissions. Current peri-operative recommendations to minimize risk of SSI includes use of antibiotic prophylaxis. A single dose of an intravenous antibiotic determined by local hospital policy, at least 30 min before surgery is recommended (Cima et al., 2013; Li et al., 2013; National Institute for Health and Clinical Excellence, 2008; Scottish Intercollegiate Guidelines Network, 2008). The use of preoperative high-inspired oxygen fraction may further improve outcomes (Hovaguimian et al., 2013). With these measures wound infection rates after elective surgery should aim to be less than 10%.

Peri-operative measures to minimize SSI should be considered. A single dose of broad-spectrum antibiotics prior to commencement of surgery should be administered.

Recommendation grade A

3.2.10 Intra-operative monitoring
Intra-operative maintenance of normothermia with infusion of warmed fluids and body heating by an upper body forced-air heating cover, or operating table heating mats, reduces wound infections and other complications (Mehta & Barclay, 2013; Tillman et al., 2013).

There are conflicting reports on the impact of perioperative fluid replacement on complications (Pestana et al., 2014). Titrated fluid administration according to variations in the cardiac output, measured by non-invasive monitoring reduces complication rates (Pearse et al., 2014).

3.2.11 Postoperative measures
Nasogastric decompression tubes should not be used as a routine in the postoperative period. If a tube is placed during surgery, it should generally be removed before the patient wakes up from anaesthesia. The routine use of nasogastric decompression delays the return of gut function, leads to an increase in pulmonary complications and prolongs hospital stay (Rao et al., 2011).
There remains a wide variation in the use of abdominal drains after colonic resection (Karliczek et al., 2006). Meta-analyses have revealed that routine prophylactic drainage of the abdominal cavity following colonic resection does not confer any advantages (Karliczek et al., 2006). However, a meta-analysis concluded that the use of a pelvic drain reduces the incidence of extraperitoneal colorectal anastomotic leakage and the rate of re-intervention after anterior rectal resection (Rondelli et al., 2014).

To control postoperative pain, patients should be prescribed regular paracetamol and opiates as required. Emerging data suggest that postoperative NSAIDs may adversely affect anastomotic leak rates and should be used with caution (Bhangu et al., 2014; Klein et al., 2012).

3.2.12 Anastomotic complications
Anastomotic dehiscence is a major cause of morbidity and mortality after colorectal cancer resection. The ACPGBI and ASGBI have issued an extensive document about reduction, diagnosis, and management of colorectal anastomotic leakage (McDermott et al., 2016). For patients and their families being counselled for surgery when an anastomosis is being considered, a balanced discussion of anastomotic leakage and its immediate and long-term consequences including risk of associated mortality is necessary. Appropriate preoperative discussion with a stoma specialist may allow informed choice in patients where a permanent stoma is an option instead of an anastomosis (in particular a higher risk anastomosis). Patients who have suffered from anastomotic leakage should be given prompt and appropriate medical attention, as well as a frank and open explanation about the complication as soon as their condition permits.

Anastomotic dehiscence is more frequent after anterior resection and the risk increases with proximity to the dentate line. A randomized controlled trial demonstrated the benefit of a defunctioning proximal stoma in reducing clinical leak rates and the need for re-operation after low anterior resection (Matthiessen et al., 2007). Trials comparing defunctioning ileostomy with colostomy have reported conflicting results, however the balance of evidence marginally favours an ileostomy (Chen et al., 2013; Guenaga et al., 2007; Law et al., 2002).

Whilst a defunctioning stoma reduces the risk of anastomotic dehiscence, potential complications of stoma reversal and non-reversal should be considered prior to a restorative procedure (David et al., 2010). Abdominoperineal excision should not be regarded as an inferior operation to low anterior resection in the management of low rectal cancer on the basis of quality of life alone (How et al., 2012).

Bowel function after a low anterior resection is often problematic and many patients have urgency and frequency, partly attributable to loss of the reservoir function of the rectum. A colonic J-pouch or an alternative neo-reservoir such as an end-to-side anastomosis can improve function (Heriot et al., 2006).

Viable tumour cells can be demonstrated in the lumen of the colon at the time of operation (Umpleby et al., 1984), the use of a cytocidal washout prior to anastomosis is recommended and may reduce anastomotic recurrence (Rondelli et al., 2012).

The risk factors for anastomotic dehiscence include male sex, increasing age, obesity and low (<5 cm from anorectal junction) anastomosis after anterior resection.

Patients having an anastomosis should be made aware of the risks of potential complications, such as dehiscence, sepsis and strictures.

Recommendation grade D

Cytocidal washout of the rectal stump should be used prior to anastomosis.

Recommendation grade B

Colorectal units should audit their leak rate for colorectal cancer surgery.

Recommendation grade D

Colorectal units should expect to achieve an operative mortality of less than 20% for emergency surgery and less than 5% for elective surgery for colorectal cancer.

Recommendation grade B

After low anterior resection, a temporary defunctioning stoma should be considered.

Recommendation grade B

3.2.13 Rates of permanent stoma formation
The rate of permanent stoma formation after rectal cancer surgery varies considerably, with APE rates ranging from 9% to 50% across England (Morris et al., 2008). Case-mix and an increasingly elderly population may explain some of this variation but surgical approach and technical aspects are also important. The lowest rates tend to be achieved by specialist high-volume surgeons (Morris et al., 2011). The LOREC programme has addressed some of these issues. In low rectal cancers, the feasibility of restorative anterior resection may be debatable. Even though anterior resection may be feasible, other factors such as body habitus, pre-existing incontinence, need for preoperative therapy or
co-morbidities may mean that a permanent stoma is a better option for some patients (How et al., 2012).

Although defunctioning stomas are intended to be temporary at the time of surgery, up to 25% will become permanent (Kuryba et al., 2016; Sier et al., 2015). The ACPGBI National Bowel Cancer Audit of 4879 patients who had an ileostomy during anterior resection between 2009 and 2012 reported a reversal rate of 72.5% within 18 months (Kuryba et al., 2016). Although most surgeons aim to reverse a stoma within 2–4 months of initial surgery, the median time to closure was 10 months, possibly due to postoperative complications, adjuvant chemotherapy or reversal having a lower organizational priority. Non-closure was more likely in patients who are older (>80 years), have a higher ASA grade, higher T stage and multiple co-morbidities. Patients undergoing an open procedure and those in the most deprived quintile of socioeconomic deprivation were also less likely to be reversed.

The permanent stoma rate following rectal cancer resection of colorectal units should be audited.

Recommendation grade D

Patients should be warned that there is potential significant delay in ileostomy closure following anterior resection and up to 25% may never get reversed.

Recommendation grade B

3.3 Surgical Resection Technique

3.3.1 Rates of curative resection

Tumours that are completely excised are classified as R0, those with microscopic (but not macroscopic) margin involvement are classified as R1 and those with macroscopic margin involvement as R2. However, it is advisable to correlate macroscopic margin involvement with the intra-operative findings at an MDT meeting discussion prior to designation as R2 (Loughrey et al., 2014), given the significant prognostic impact of this interpretation.

A R0 resection should be achieved in >90% of colorectal cancers predicted to be resectable on appropriate staging.

Recommendation grade B

3.3.2 Malignant colorectal polyp

The ACPGBI published a document on management of malignant colorectal polyps in 2013. Subsequent treatment of patients with malignant polyps depends on the risk of residual disease, age and co-morbidity. The risks of polyp surveillance vs the risks of surgical resection should be discussed with the patient (Williams et al., 2013). An ongoing SPECC (Significant Polyp Early Colorectal Cancer) Program is in progress to address these issues (Moran & Dattani, 2016).

3.3.3 Resection of colon cancers

The concept of complete mesocolic excision (CME), which parallels total mesorectal excision (TME) for rectal cancer, has sparked a renewed interest in optimizing the quality of colon cancer surgery (Hohenberger et al., 2009; West et al., 2010). The terminology surrounding complete mesocolic resection can be confusing. Complete mesocolic excision equates to precise anatomical excision of the colon and its mesentery, maintaining an intact mesocolic fascia, separating the visceral and parietal layers. This approach is intrinsic in a meticulous technique for cancer surgery. CME should be accompanied by appropriate central vascular ligation (CVL), however, the exact definition of CVL is more difficult to standardize and the potential oncological benefits may be compromised by increased morbidity with extensive mobilization of the duodenum and pancreas to access the mesenteric root (Bertelsen et al., 2016).

In conclusion, there is no controversy that careful surgical technique respecting embryological planes of CME is advocated. The exact contribution of extreme CVL should be tested further before wide adoption (Konovounisios et al., 2015).

Resection of colon cancer focussing on quality of mesocolic excision improves oncological outcomes.

Recommendation grade C

3.3.4 Resection of rectal cancers

The ‘concept of TME’ (total mesorectal excision) is accepted as optimal surgery for rectal cancer (Heald, 1988). A report on outcomes after a TME surgical educational programme in Stockholm suggests that TME training results in a reduction in local recurrence, a reduction in the abdominoperineal excision rate and improved survival (Martling et al., 2000). Tumours in the mid and lower rectum require a TME. However, refinements for upper rectal cancers mean that adequate lymph node clearance can be achieved by a mesorectal transection at 5 cm beyond the distal margin of the tumour. The principles of TME apply to all operative techniques for rectal cancer whether by open, laparoscopic or robotic surgery.

The recent focus is on the optimum management of low rectal cancer. An English National Development Programme (www.lorec.nhs.uk) for colorectal MDT’s was delivered between 2010 and 2013 and focused on preoperative clinical and radiological assessment,
selective preoperative radiotherapy and chemoradiotherapy, optimal surgical treatment and accurate pathological analysis of the resected specimen (Moran et al., 2014). The background to this initiative was the marked variation in APE rates across England (Morris et al., 2008; Morris et al., 2011) and the poor outcomes following APE due to a high CRM involvement rate and subsequent recurrence. A key element of this programme was optimal preoperative planning by clinical assessment and imaging. In the context of low rectal cancer, the operative strategy should be defined as four variants, namely TME with intersphincteric resection and coloanal anastomosis, TME with ultra-low Hartmann's, TME with an intersphincteric APE or an extrlevator APE (ELAPE). The concept of a ‘trial dissection’ prior to a decision of APE or anterior resection should be obsolete.

Accurate staging requires a combination of clinical assessment by an experienced surgeon and radiological imaging. This will influence the selection for neo-adjuvant therapy when appropriate and help determine the surgical strategy. If an APE is required this should be tailored to achieve a clear CRM. An ELAPE is the recommended approach for locally advanced low rectal cancers, which involve the external sphincter or the levator ani.

The concept of ELAPE is an anatomical one, involving perineal dissection ‘outside’ and on the caudal surface of the levator complex. Although generally accepted as best performed in the prone position involving turning the patient during the operation (Palmer et al., 2014), the principal of ELAPE may also be adequately completed in the supine Lloyd-Davis position (Moran & Moore, 2014; Moran et al., 2014). The prone position allows for improved access, haemostasis and facilitates training (Moran et al., 2014).

ELAPE results in a larger perineal defect if both levators are widely excised and either a surgical flap or a biological mesh may reduce morbidity. There appears to be little difference in morbidity between the two reconstructions (Foster et al., 2012). Ongoing prospective trials may provide the scientific evidence (Musters et al., 2014). The evolving approach of a ‘tailored’ ELAPE based on clinical examination and MRI imaging allows an individualized approach with unilateral or bilateral levator excision to achieve a clear CRM whilst reducing morbidity (Moran & Moore, 2014).

Care should be taken to preserve the pelvic autonomic nerves and plexuses. Perforation of the tumour or the rectum during the operation should be avoided.

Transanal total mesorectal excision (TaTME) has the potential to improve access for TME surgery in the lowest part of the rectum and possibly reduce morbidity (Lacy et al., 2015). Technological advances and international collaboration amongst surgeons aims to bring this technique into mainstream practice for selected cases and a multinational, multicentre registry is ongoing in the Pelican Centre, Basingstoke with over 1000 cases registered. The current COLOR III trial has been designed to evaluate involved CRM rates with TaTME, compared with laparoscopic TME (Deijen et al., 2016). Long-term follow-up data regarding functional results, local recurrence and survival are awaited (Bjorn & Perdawood, 2015). Surgical training in TaTME is likely to involve cadaveric courses, proctoring and mentorship with contribution from all stakeholders (Penna et al., 2016).

Choice of rectal resection should be tailored to the individual patient, focussing on achieving R0 resection, low morbidity and restorative procedures in appropriate cases.

**Recommendation grade C**

Patients requiring ELAPE should be identified based on clinical assessment and imaging. Appropriate multidisciplinary expertise should offer these patients the complete package of care.

**Recommendation grade C**

### 3.3.5 Laparoscopic and robotic surgery

Laparoscopic surgery offers potential benefits and is increasingly used in elective colorectal cancer resection. The principles of surgical technique are the same as open surgery but laparoscopy facilitates access by minimal incisions, albeit with a reduction in other aspects such as tactile sensation and, until recently, three-dimensional vision. Training and experience are crucial and have been optimized by the English LAPCO programme (Coleman et al., 2011).

Ongoing reports suggest that short and long-term results of laparoscopic colorectal cancer surgery are equivalent to open surgery, but it is acknowledged that conversion to open surgery may be required (Fleshman et al., 2007). Randomized trials (Fleshman et al., 2007; Guillou et al., 2005) have demonstrated that lymph node harvest is similar to open surgery.

Early reports on port-site recurrence in laparoscopic colorectal cancer surgery appear unfounded (Kuhry et al., 2008). Blood loss and blood transfusion requirements, short-term outcomes of wound infection and hospital stay are reduced with laparoscopic surgery, which generally involves longer operating time. Long-term follow up suggests less incisional herniation and possible reduction in small bowel obstruction (Guillou et al., 2005). The EnROL trial demonstrated similar physical fatigue and other patient reported outcomes in...
patients treated by laparoscopic or open surgery within an ERAS, but laparoscopic surgery significantly reduced length of hospital stay (Kennedy et al., 2014).

Laparoscopic resection for colon cancer is well established. There is debate about role of laparoscopic rectal cancer surgery. The Color II trial reported that laparoscopic surgery in patients with rectal cancer resulted in similar 3-year locoregional recurrence, disease-free and overall survival to those having open surgery (Bonjer et al., 2015). A meta-analysis indicates the benefits for laparoscopic rectal resection being shorter hospital stay, earlier return of bowel function, reduced blood loss and number of blood transfusions, lower rates of abdominal postoperative bleeding and late intestinal adhesion obstruction (Trastulli et al., 2012). Conversion rate of laparoscopic to open resection has evolved from as high as 29% in the CLASSIC trial (Guillou et al., 2005) to 9% for rectal cancer surgery in the ALaCaRT trial (Stevenson et al., 2015).

ALaCaRT (Australasian Laparoscopic Cancer of the Rectum) was a randomized, non-inferiority trial based at 24 sites (26 accredited surgeons) in Australia and New Zealand. A total of 475 patients with T1–T3 rectal adenocarcinoma, less than 15 cm from the anal verge were recruited. Non-inferiority of laparoscopic surgery compared with open surgery for successful resection was not established. Although the overall quality of surgery was high, these findings do not provide sufficient evidence for the routine use of laparoscopic surgery for rectal cancer (Stevenson et al., 2015). Similarly, the ACOSOG Z6051 trial reported that in patients with stage II or III rectal cancer, the use of laparoscopic resection compared with open surgery for successful resection failed to meet the criterion for non-inferiority for pathologic outcomes (Fleshman et al., 2015). In both these trials a successful resection (clear circumferenental and distal margin) was achieved more frequently with open compared with laparoscopic resection (statistically not significant), but operating time was longer in the laparoscopic group and blood loss, higher in the open group. In neither trial was there a significant difference in hospital stay.

Robotic surgery promises the next technological advance in the management of rectal cancer (Mirnezami et al., 2010a). Prospective trials like ROLARR (RObotic vs LAparoscopic Resection for Rectal Cancer) will report on its potential role (Collinson et al., 2012). Early indications suggested that robotic rectal cancer surgery is as safe and effective as laparoscopic surgery, with a possible benefit in males, the obese, and patients with low rectal cancers in terms of the need to convert to open surgery.

Laparoscopic resection should be considered in all patients with colon cancer. This should be performed by suitably trained, experienced surgeons who should audit outcomes and submit results to the NBOCA database.

Recommendation grade A

Open surgery results in similar outcomes compared with laparoscopic surgery for cancer of the rectum. Laparoscopic surgery may have some short term benefits.

Recommendation grade B

Patients undergoing laparoscopic surgery should be made aware of the possibility to convert to an open operation as a part of informed consent.

Recommendation grade D

3.3.6 Record keeping

Operation notes should be documented according to the guidelines issued by the Royal College of Surgeons (The Royal College of Surgeons of England, 2014).

A check-list should be used to construct an operation note for patients undergoing surgery for colorectal cancer.

Recommendation grade D

The Colorectal MDT should meet on a regular basis to allow timely decisions. Minutes should record clinical decisions and attendance.

Recommendation grade D

3.4 Other Management Issues

3.4.1 Managing patients presenting as emergencies

Approximately 20% of colorectal cancers present as emergencies, mainly with bowel obstruction and less commonly bleeding and perforation. This is associated with high peri-operative mortality. A clinical diagnosis of obstruction should be confirmed by a contrast-enhanced CT scan to exclude pseudo-obstruction. A flexible sigmoidoscopy should be considered prior to surgery to assess the rectum and left side of colon.

Endoluminal stenting can be considered as a definitive palliative procedure, or as a bridge to surgery, in selected cases of large bowel obstruction (Girocchi et al., 2013; Tan et al., 2012). There are some oncological concerns about its role as a bridge to surgery (Gorissen et al., 2013). Early results of the UK CReST trial, which randomized 246 patients to stenting as a bridge to surgery, vs immediate surgery demonstrated similar 30-day postoperative mortality (5.3% vs 4.4%) and length of stay (15.5 days vs 16 days). Overall stoma formation was reduced (45% vs 69%; P < 0.001) in
patients randomized to the stent arm (Hill et al., 2016). However, data on longer term oncological outcomes are awaited.

Patients with obstruction must be carefully optimized for surgery, within the environment of high dependency or ITU if necessary, with particular focus on adequate fluid resuscitation (Association of Surgeons of Great Britain and Ireland, 2014).

All patients with suspected large bowel obstruction should have a contrast-enhanced CT.

Recommendation grade C

Selected patients with large bowel obstruction may be suitable for endoluminal stenting as a definitive palliative procedure.

Recommendation grade B

The use of a stent as a bridge to surgery can be considered.

Recommendation grade B

Patients with a predicted mortality of >10% should be managed in a Critical Care Unit.

Recommendation grade D

3.4.2 Managing colorectal cancer in older patients

The incidence of colorectal cancer rises with age and the majority of patients are over 70 years at presentation. With increasing longevity, many patients are diagnosed in their 80s and 90s. This population is often more complex to manage, with greater co-morbidity and are highly vulnerable to changes in physical performance and quality of life. This can make the challenges of major surgery unappealing for patients and clinicians. These issues are crucial when discussing optimum treatment for patients undergoing elective and emergency surgery for colorectal cancer (Neuman et al., 2013). There is an increasing awareness that performance status rather than biological age is central to decision making.

The surgical issues for patients with colorectal cancer are not exclusive to the older population. However, some aspects demand particular attention:

1 Patient fitness and personal choice are more important than age.
2 Location of tumour; for example major surgery for rectal cancer has a potentially greater impact on the older patient with increased risks of morbidity and mortality and alternative treatment options such as local excision and radiotherapy may be more appropriate.
3 Risks of harm and death from the proposed treatment.
4 Patient’s realistic life expectancy.

3.4.2.1 Surgical options in older patients

Laparoscopic surgery appears to be safe, and may have advantages compared with open surgery, in older patients as suggested in a recent systematic review and pooled analysis of eleven studies (Grailey et al., 2013). Operative mortality and anastomotic leak rates were equivalent, but the length of stay was reduced. However, the series analysed were highly heterogeneous with a wide variation in the definition of ‘elderly’, ranging from 70–90 years (Grailey et al., 2013). Chaudhary et al. reported reduced morbidity, length of stay and a 30 day mortality of 1.7% from laparoscopic surgery in patients over 80 years (Chaudhary et al., 2012).

3.4.2.2 Outcomes after surgery in older patients

Faiz et al. (2011) reported outcomes after elective colorectal cancer surgery in over 28 000 patients over the period 1997–2007 (Faiz et al., 2011). For both proximal and distal cancers, the 30-day mortality doubled in the 85–89 years olds compared with younger patients; 8% vs 3.8% and 8.3% vs 3.7% respectively. Multivariate analysis confirmed advancing age to be an independent predictor of 30-day mortality. The use of laparoscopy was associated with reduced 30-day mortality, whereas male gender and Charlson co-morbidity score of >3 were associated with increased 30-day mortality.

This report also highlighted the large percentage of older patients dying within 1 year of surgery, up to 36% in the over 90s. This is an important consideration in assessing the use of surgical treatments where control of cancer may be more appropriate than attempts to cure at the cost of a higher morbidity and mortality.

3.4.2.3 Emergency surgery in older patients

Mortality and morbidity from emergency surgery in colorectal cancer is high for all ages, though significantly greater for older patients (Neuman et al., 2013). It has been reported that over 40% of patients >70 years undergoing emergency surgery for benign and malignant conditions, are dead within 12 months, rising to >50% in those over 80 years (Mamidanna et al., 2012).

3.4.2.4 Health-related quality of life and surgery in older patients

For many patients quality of life is often more important than quantity and this is particularly the case for many elderly patients. Mastracci et al. investigated this in a group of patients above 80 years compared to those under 70 years, using EORTC-C30, EORTC-CR38 and SF-36 to assess health-related quality of life after surgery for colorectal cancer. Patients over 80 years maintained quality of life in all domains
except ‘vitality’ in SF-36, and presence of stoma-related problems had greatest impact (Mastracci et al., 2006). This suggests that with careful patient selection the impact of elective surgery can be minimized. Scarpa and colleagues compared the impact of laparoscopic and open surgery on outcome and specifically health-related quality of life in 116 patients, of whom 77 were over 70 years. There was no difference in HRQOL between laparoscopic and open surgery in the older population although fewer complications occurred in the laparoscopic group (Scarpa et al., 2013). The over 70’s recorded reduced global quality of life at 1 month compared with those less than 70 years old. The reduction in ‘Role Function’, ‘Cognitive Function’ and sleep disturbance persisted for 6 months.

3.4.2.5 Adjuvant chemotherapy and older patients
The role for adjuvant chemotherapy after potentially curative surgery for stage III colorectal cancer is established. However, trials of chemotherapy have generally excluded older patients and the impact of improved disease-free survival seen in adjuvant trials may not fully translate to an older population with competing risks of mortality and greater vulnerability to toxicity of chemotherapy. Nevertheless, fit older patients with high-risk stage III cancers will benefit from adjuvant therapy (Muss & Bynum, 2012).

3.4.2.6 Summary
Colorectal cancer is a devastating diagnosis for all patients. However, a frail or co-morbid older patient population is particularly vulnerable to the effects of this disease and its treatments. The fragile balance of physical, social and psychological wellbeing can be irreparably disturbed by surgery and its complications, meaning that many patients never return to their previous psychosocial status and many fail to survive 12 months after treatment. For these individuals careful consideration of treatment options is important, potentially including a compromise in achieving oncological excellence for better quality of life. However, older patients with colorectal cancer form a mixed group and those who are fit and free from major co-morbidity may wish to explore the full gamut of therapeutic options and can expect to enjoy outcomes not dissimilar to the general population.

Assessment of older patients for suitability of treatment should be based on co-morbidity and performance status, rather than age alone.

Recommendation grade C

Older patients being offered curative resection should be considered for laparoscopic surgery.

Recommendation grade C

Decision-making in older patients should consider co-morbidities, life expectancy and the natural history of the cancer.

Recommendation grade D

Older patients should be appropriately counselled about the risk of compromise of quality of life following surgery.

Recommendation grade D

Adjuvant chemotherapy should be considered in older patients with stage III colorectal cancer, with appropriate tailoring of treatment.

Recommendation grade B

3.4.3 Management of advanced and recurrent disease
3.4.3.1 Locally advanced and recurrent disease
Patients with locally advanced colorectal tumours may benefit from multi-visceral resection, beyond conventional excision planes. Likewise, multi-visceral resection may offer patients with local recurrence following rectal cancer surgery a second opportunity for cure. Recent advances have expanded the options for such patients, through improvements in reconstructive techniques and management of intra-operative challenges. Management decisions are highly complex and treatment requires a multidisciplinary, multimodality approach within a specialist unit. Therefore, patients should be managed within an appropriate MDT, based on the principles agreed by the Beyond TME Collaborative (Beyond TME Collaborative, 2013).

In order to achieve optimal results, appropriate selection of patients for radical surgery, which is often associated with significant morbidity is critical. CT chest, abdomen and pelvis should be performed to identify distant metastases. MRI pelvis can precisely locate the tumour, its relationship to significant structures such as the greater sciatic notch and major vessels and extent of sacral involvement in order to help plan the surgical approach. FDG PET/CT is useful for assessing uptake at the site of the mass and identifying occult distant metastases (Mirnezami et al., 2010b). If the patient is radiotherapy naïve, and biopsy-positive, long course CRT should be given before resection. Patients with a high suspicion of recurrence on MRI, which is FDG-PET positive but biopsy is not considered safe or feasible, can be managed with resection or watchful waiting.
Preoperative chemotherapy to downstage tumours has little value.

Resection should be sufficiently radical to achieve an R0 resection (Bhangu et al., 2013). Central disease with urogenital involvement will require en bloc resection (e.g., total pelvic exenteration if the trigone of the bladder is involved, anterior exenteration if uterus/vagina involved). Sacral involvement requires varying degrees of sacral resection. The S2/3 disc space is critical; below this level the sacrum can be resected without bony stabilization. Above the S2/3 disc some form of support is needed. Involvement of the pelvic side-wall requires attention to the layers of the sidewall with early control of the vessels and re-implantation of the ureter. Such techniques improve R0 margin status (Solomon et al., 2015). A multidisciplinary surgical team is key, which may include urology, vascular, orthopaedic, plastics and gynaecological surgeons in addition to colorectal surgeons (Beyond TME Collaborative, 2013).

Postoperative morbidity is significant and often relates to major problems with perineal wound healing. While perineal closure may be achieved primarily with, or without, the use of omentoplasty, biological or absorbable mesh, pedicled flaps are often required such as transpelvic rectus abdominus or gluteal rotational or advancement flaps. Postoperative chemotherapy offers limited benefit (Harris et al., 2016). Following surgery of this nature, quality of life is satisfactory and superior to non-surgical palliation (Harji et al., 2015).

Patients with locally advanced and locally recurrent rectal cancer should be referred to a specialist centre for consideration for resection.  
**Recommendation grade C**

Preoperative imaging should include CT chest abdomen and pelvis to exclude metastases and MRI pelvis to accurately assess the recurrence.  
**Recommendation grade B**

Surgery should aim to achieve an R0 resection.  
**Recommendation grade B**

3.4.3.2 Liver metastases

Management of both synchronous and metachronous liver metastases needs careful evaluation for resectability with a potentially curative intent. A population-based study reported a significant variation in liver resection rates across cancer networks and with 5-year survival of 44% (Morris et al., 2010). There have been significant advances in the multimodality treatment of liver metastases, including neoadjuvant chemotherapy, non-anatomical resection and ablative therapies (Garden et al., 2006).

Colorectal MDTs should have a low threshold to refer cases to the hepato-biliary (HPB) MDT for potential intervention. The logistics and timing of surgery should be carefully coordinated between MDTs.  
**Recommendation grade B**

3.4.3.3 Lung metastases

In selected patients undergoing lung metastectomy, 5-year survival up to 43% has been reported (Zampino et al., 2014). A systematic review of survival after lung metastectomy reported better outcomes with solitary metastases, absence of involved mediastinal lymph nodes, normal pre-thoracotomy CEA and longer interval between colorectal and lung resection (Gonzalez et al., 2013). The ongoing PulMICC trial aims to compare resection of lung metastases with active monitoring, initially as a feasibility study for a subsequent large randomized controlled trial.

Synchronous and metachronous liver or lung metastases should be considered for potentially curative treatments.  
**Recommendation grade B**

3.4.3.4 Peritoneal metastases

Diffuse dissemination of colorectal cancer within the peritoneal cavity is an ominous finding in about 10% of patients at initial diagnosis and 25% at recurrence. In the 25–35% of patients with recurrent disease confined to the peritoneum, a proportion will be amenable to potentially curative local therapy, using a combination of cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) (Elias et al., 2010; Klaver et al., 2010; Moran & Cecil, 2013). The 2013 NHS England commissioning document (NHS England, 2013) recommends the following suitability criteria:

- Disease amenable to complete tumour removal
- Absence of systemic metastatic disease
- Able to withstand major surgery
- Treatment at an experienced surgical centre with facilities for HIPEC

CRS/HIPEC was popularized by Sugarbaker, initially for Pseudomyxoma Peritonei (PMP) but its use was translated to colorectal peritoneal metastases. The rationale for this strategy is based on the ‘redistribution phenomenon’, which was initially described in perforated mucinous tumours of the appendix (Moran & Cecil, 2013; Sugarbaker, 1994). Free-floating intra-peritoneal cells accumulate at predictable sites within the peritoneum.
peritoneal cavity including sites of normal peritoneal fluid absorption such as the omentum (hence the omental ‘cake’) and the under-surface of the diaphragm (particularly the right), the effects of gravity resulting in disease in the pelvis and paracolic gutters, with relative sparing of motile organs, particularly small bowel unless there are adhesions from extensive prior surgery.

Whilst the biology of colorectal cancer in the peritoneal cavity is generally more invasive compared with PMP, the redistribution phenomenon may also apply to a subset with either limited disease, or ‘visceral sparing’ and thus amenable to CRS/HIPEC (Moran & Cecil, 2013). In this context the term resectable ‘colorectal peritoneal metastases’ (CPM or PMCR) is a useful concept helping to select appropriate candidates for intervention (Moran & Cecil, 2013).

The incidence of resectable CPM, without extra-abdominal spread, has been estimated at 3% of patients with colorectal cancer or approximately 1000 per year in England alone. However many will be unfit or unwilling to undergo the complex strategy of CRS/HIPEC (Moran & Cecil, 2013). The current evidence-base for CRS/HIPEC in selected patients with CPM, which includes animal experiments (Verwaal et al., 2003), a single randomized controlled trial and a comprehensive review of a number of case series by the National Institute of Health and Care Excellence (NICE) (National Institute for Health and Clinical Excellence, 2010a). CRS/HIPEC results in a 5-year overall survival of 19% and is a recommended treatment option in carefully selected patients (National Institute for Health and Clinical Excellence, 2010a).

The crucial factor in CRS/HIPEC for CPM is that complete tumour removal is essential to optimize outcomes and to counterbalance the associated mortality and morbidity risks (National Institute for Health and Clinical Excellence, 2010a). In the largest multicentre review of 523 patients undergoing CRS and HIPEC, postoperative mortality was 3.3%, serious complications occurred in 31% and 57 patients (11%) required reoperation (Elias et al., 2010).

Scoring systems such as the Peritoneal Carcinomatosis Index (PCI range 0–39), the Simplified Peritoneal Cancer Index (SPCI range 0–21) and the 7 region count from the Netherlands Cancer Institute all describe the volume and spread of peritoneal disease within the abdomen and unsurprisingly ‘less is better’ (Elias et al., 2010; National Institute for Health and Clinical Excellence, 2010a).

Currently CT is the main mechanism for establishing extent of disease and estimating accurate preoperative PCI score (and thus likelihood of complete cytoreduction). Increasingly laparoscopy is recommended to aid selection and reduce ineffectual laparotomy (Iversen et al., 2013). The best results are in limited disease, usually confined to one or two quadrants of the abdomen, synchronous resection of the primary with peritoneal disease and with a minimum of 200 cm of uninvolved small bowel (Elias et al., 2010; Moran & Cecil, 2013).

A further emerging concept is ‘second look’ at 6–12 months for patients at high risk of CPM based on a perforated primary tumour, Krukenberg ovarian metastases or limited peritoneal disease at the primary operation (Elias et al., 2011; Moran & Cecil, 2013).

Patients with colorectal cancer and localized peritoneal disease at primary presentation or as localized recurrence may benefit from discussion with a peritoneal malignancy unit.

**Recommendation grade C**

Optimal CT is currently the best imaging technique but is limited in low volume disease.

**Recommendation grade C**

3.4.4 Other malignant conditions

3.4.4.1 Pseudomyxoma peritonei

Pseudomyxoma peritonei is a rare condition, characterized by accumulation of mucinous ascites, generally originating from a perforated mucinous tumour of the appendix. Patients may present unexpectedly at laparotomy or laparoscopy, as a perforated appendix or increasingly at cross-sectional imaging. The optimal treatment is macroscopic complete tumour removal by cytoreductive surgery (CRS) combined with hyperthermic intra-peritoneal chemotherapy (HIPEC). Assessment and treatment of pseudomyxoma peritonei has been commissioned by the English NHS at Basingstoke and Christie Hospital Manchester.

Patients with a perforated mucinous appendiceal tumour or pseudomyxoma peritonei should be discussed with a peritoneal malignancy unit.

**Recommendation grade C**

3.4.4.2 Neuroendocrine neoplasms

Although colorectal neuroendocrine neoplasms (NENs) are rare, the incidence of these tumours is rising. Diagnosis, classification and grading (G1-3) of these tumours should be based on morphology, confirmatory immunohistochemical markers, mitotic count and Ki 67 index. Consensus guidelines on management of colorectal NENs have been published by the European Neuroendocrine Tumour Society (ENETS) (Caplin et al., 2012; Ramage et al., 2016). There has been recent
renewed interest in the diagnosis and management of NENs, with new treatment advances including hormonal therapy, tyrosine kinase and mTOR inhibitors, chemotherapy, peptide receptor radionuclide therapy and hepatic artery embolization. Review of histology and staging investigations by a regional neuroendocrine tumour (NET) MDT should be arranged.

These tumours should be staged similar to that for bowel adenocarcinoma, for the site of origin, if known. In the absence of distant metastases, standard surgical resection of the primary tumour and locoregional lymph nodes should be performed. However, small incidental tumours may not require further treatment beyond complete endoscopic removal or local excision.

Morphologically well-differentiated (G1-2) NETs, previously classified as carcinoid tumours arise more frequently in the rectum. These are often diagnosed on routine sigmoidoscopy and can be locally excised, with a low risk of recurrence if small (<2 cm). More advanced well-differentiated NETs frequently follow an indolent clinical behaviour, even in the presence of distant metastases or unresectable primary disease. Morphologically poorly differentiated (G3) neuroendocrine carcinomas (NECs) are very aggressive malignant tumours, with a Ki 67 >50% in most cases and may be sub-classified as large cell and small cell NECs. These tumours are associated with a very poor prognosis.

Patients diagnosed with neuroendocrine neoplasms may benefit from referral to a regional centre specializing in NETs, for confirmation of histological diagnosis and advice on subsequent management.

Recommendation grade C

Conflicts of interest

None of the authors have any conflicts of interest to declare.

References


Hitchins CR, Lawn A, Whitehouse G, McFall MR. The straight to endoscopy service for suspected colorectal cancer: meeting national targets but are we meeting our patients’ expectations? Colorectal Dis 2014; 16: 616–9.


Loughrey M, Quirke P, Shepherd N. Standards and datasets for reporting cancers. Dataset for colorectal cancer.
Guidelines

B. Moran et al.


Effect of Laparoscopic-Assisted Resection vs Open Resection on Pathological Outcomes in Rectal Cancer: the ALACaRT Randomized Clinical Trial. *JAMA* 2015; 314: 1356–63.


