LCA Colorectal Cancer Clinical Guidelines

September 2014
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Introduction

Between 1971 and 2008, incidence rates for colorectal cancer have increased by 33% for men and 12% for women. In England in 2008, colorectal cancer accounted for 14% of all new cancer diagnoses in men (57 new cases per 100,000 population) and 12% in women (37 new cases per 100,000). 5-year survival rates from cancer of the colon and cancer of the rectum are calculated separately. For colon cancer, the 5-year survival rate for men is 52% and for women 54% (diagnosed between 2004 and 2008 and followed up to 2009). For cancer of the rectum, the 5-year survival rate for men is 54% and for women 57% (diagnosed between 2004 and 2008 and followed up to 2009).

Colorectal cancer is most commonly diagnosed in those aged 60 and over. Cases are highest in those aged 70–79 for men and in those aged 85 and over for women. For a number of the symptoms associated with colorectal cancer, the risk of achieving a firm diagnosis varies with age. 25% of patients diagnosed with colorectal cancer present through an emergency presentation, 26% are diagnosed through an urgent 2-week wait referral and 24% are diagnosed through a GP referral not completed through an urgent 2-week wait referral.

The disease usually arises from benign polyps. Given that the cure rate with current treatment modalities in early stage disease approaches >90% overall, there is considerable scope for improving outcomes for patients with colorectal cancer. The NHS bowel cancer screening programme was introduced in 2006 for men and women in their 60s and achieved national coverage by 2010. The age inclusion criteria have been extended to men and women up to their 75th birthday (those aged over 75 can self-refer) and the first wave of flexible sigmoidoscopy screening for everyone aged around 55 began in April 2013.

Until the screening programmes have a significant impact on outcomes, current circumstances demand the prompt recognition of symptomatic disease with rapid access to effective diagnostic services and modern treatment modalities under the guidance of the multidisciplinary team.

The Improving Outcomes Guidance (IOG) and peer review process based on the Manual for Cancer Services Colorectal Measures (2014) guidance aim to provide the highest possible standard of care for all patients who present with colorectal cancer. The Association of Coloproctology of Great Britain and Ireland (ACPGBI) 2007 guidelines and the National Institute for Health and Care Excellence 2011 guidelines provide evidence-based advice on the diagnosis and management of colorectal cancer. The London Cancer Alliance (LCA) Colorectal Pathway Group guidelines described in this document are based on these documents, with emphasis on local principles and practice. In addition to evidence-based clinical information, these guidelines provide protocols and examples of current evidence-based management designed to be used by all healthcare professionals involved in the care of colorectal and anal cancer patients.

The LCA Colorectal Cancer Clinical Guidelines have been produced with the assistance of a multidisciplinary group of clinicians to provide a comprehensive overview of the colorectal cancer patient’s journey from referral to treatment and support. The guidelines conform to recognised best practice (IOG) to ensure delivery of consistently high standards of care in Trusts that treat colorectal cancer patients within the Integrated Cancer System.

It should be noted that the LCA guidelines supersedes the guidelines previously produced by the former cancer networks in north west, south west and south east London.
These guidelines are a living document and will be reviewed and updated regularly to ensure that they reflect any changes in practice and emerging clinical evidence.

I would like to thank members of the LCA Colorectal Cancer Pathway Group for their contribution to these clinical guidelines. In particular, I would like to thank the following individuals for their contributions to specific sections of the guidelines:

- Paul Ross – Consultant in Medical Oncology, Guy’s and St Thomas’ NHS Foundation Trust
- Andrew Gaya – Consultant Clinical Oncologist, Guy’s and St Thomas’ NHS Foundation Trust
- Pippa Riddle – Consultant Clinical Oncologist, West Middlesex University Hospital NHS Trust
- Kevin Monahan – Consultant Gastroenterologist, West Middlesex University Hospital NHS Trust
- David Burling – Consultant Gastrointestinal Radiologist, St Mark’s Hospital
- Gina Brown – Consultant Radiologist, The Royal Marsden NHS Foundation Trust
- Paul Ziprin – Consultant General Surgeon, Imperial College Healthcare NHS Trust
- Rob Goldin – Consultant Pathologist, Imperial College Healthcare NHS Trust

Mr Muti Abulafi
Chair, LCA Colorectal Pathway Group
Consultant Colorectal Surgeon, Croydon University Hospital

1 National Institute for Health and Care Excellence (2004) *Improving Outcomes for Colorectal Cancer*
3 National Institute for Health and Care Excellence (2011) *Colorectal cancer: The diagnosis and management of colorectal cancer*
Executive Summary

The LCA Colorectal Cancer Clinical Guidelines combine the best aspects of the former cancer network guidelines and have been updated to reflect changes and developments in practice. The guidelines are multidisciplinary and cover primary care referrals, clinical examination and investigation, surgery, treatment modalities, survivorship and palliative care.

The chapter on early diagnosis and screening (Chapter 1) summarises survival rates according to stage at diagnosis and sets out the priorities and actions to promote early diagnosis and increase the uptake in screening.

Primary care referrals in Chapter 2 outline the best-practice referral pathways from primary care (including details of clinical assessment in primary care).

Chapter 3 looks at clinical examination and investigation, and provides information on the diagnosis and staging of colorectal cancer.

The imaging section (Chapter 4) provides an outline of the best-practice modalities for staging and surveillance of colon and rectal cancer.

Information about the multidisciplinary team (MDT) in Chapter 5 outlines the various MDTs involved in the management of colorectal cancer, along with the composition of core and extended teams.

The surgery section (Chapter 6) outlines the surgical management of colorectal patients and includes preparation for surgery, the various procedures recommended, enhanced recovery to reduce the length of stay, and emergency presentations. Surgical outcomes and metrics are also included in this section.

Pathology information (Chapter 7) is informed by the Royal College of Pathologists Minimum Data Set for Colorectal Cancer Histopathology reports¹ for the diagnosis and assessment of colorectal cancer.

Chapter 8 and Chapter 9 are dedicated to non-surgical oncology. Chapter 8 provides an overview of radiotherapy including neo-adjuvant chemotherapy in rectal cancer. It highlights the importance of customising treatment to individual patient requirements and this may entail consultation between clinicians, physicists and radiographers. Information is provided on the different treatment and dosage modalities throughout the pathway – that is, pre-operative and post-operative. The chapter also outlines management of early rectal cancer and locally recurrent rectal cancer.

Chapter 9 outlines in detail the chemotherapy regimens for the various stages of colorectal cancer including first, second and third-line treatments.

The section on management of locally advanced, recurrent, metastatic colorectal cancer (Chapter 10) provides information on locally advanced primary pelvic disease, local recurrence and liver and lung metastases.

Chapter 11 outlines follow-up procedures for colorectal cancer, while Chapter 12 identifies the pathways for management of patients with heritable colorectal cancer.

The section on anal cancer (Chapter 13) sets out the guidelines for diagnosing, staging, referral, treatment and follow-up.

Chapter 14 summarises the key points in breaking bad news, Chapter 15 sets out the support offered to patients and Chapter 16 summarises the communication with GPs and tertiary referrers.
The waiting times section (Chapter 17) gives details of the national cancer waiting times targets that should be achieved. This includes a 62-day pathway with timelines, which has recently been developed and is currently being implemented across the LCA.

The piece on survivorship (Chapter 19) lays out the principles of good survivorship care as guidelines and recommendations made to all cancer services within the LCA. The chapter draws on best available evidence and current national policy and was written in response to various workstreams, including the National Cancer Patient Experience Survey.

Palliative care information (Chapter 20) includes the recently agreed LCA guidelines for referral to a specialist palliative care team.

Finally, Appendix 11 provides a quick glance summary of the various treatment pathways of colorectal cancer described in these guidelines.

1 www.rcpath.org/publications-media/publications/datasets/colorectal-cancer
1 Early Diagnosis and Screening of Colorectal Cancer

“To promote earlier and more effective engagement of patients with cancer care will require a cultural shift by health professionals, political leaders, and citizens alike, to encourage access.”

The Lancet (editorial), February 2013

Colorectal cancer is perhaps the only cancer that starts as a benign adenomatous polyp, which can last for a few years before it develops into cancer. The adenoma carcinoma sequence is now widely accepted as the process by which most, if not all, colorectal cancers arise. Therefore there is a great opportunity to eradicate colorectal cancer if the polyps are detected and removed before they develop into cancers. Furthermore, the 5-year survival following treatment of colorectal cancer is much higher at earlier stages of the cancer (see Table 1.1). Earlier cancers have better outcomes and are treated with minimally invasive techniques that are associated with lower morbidity and earlier return to normal life.

Table 1.1: No. of cases (1996–2006) and 5-year relative survival of colorectal cancer patients (diagnosed 1996–2002) by stage at diagnosis, England

<table>
<thead>
<tr>
<th>Stage at diagnosis</th>
<th>Number of cases</th>
<th>Percentage of cases (%)</th>
<th>Percentage of cases excl. unknown (%)</th>
<th>5-year relative survival (%)</th>
<th>Confidence interval (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dukes A</td>
<td>26,727</td>
<td>8.7</td>
<td>13.2</td>
<td>93.2</td>
<td>92.5–93.9</td>
</tr>
<tr>
<td>Dukes B</td>
<td>74,784</td>
<td>24.2</td>
<td>36.9</td>
<td>77.0</td>
<td>76.4–77.5</td>
</tr>
<tr>
<td>Dukes C</td>
<td>72,806</td>
<td>23.6</td>
<td>35.9</td>
<td>47.7</td>
<td>47.1–48.3</td>
</tr>
<tr>
<td>Dukes D</td>
<td>28,377</td>
<td>9.2</td>
<td>14.0</td>
<td>6.6</td>
<td>6.1–7.0</td>
</tr>
<tr>
<td>Unknown</td>
<td>106,040</td>
<td>34.3</td>
<td>–</td>
<td>35.4</td>
<td>35.0–35.8</td>
</tr>
<tr>
<td>Total</td>
<td>308,734</td>
<td>100.0</td>
<td>100.0</td>
<td>50.7</td>
<td>50.4–51.0</td>
</tr>
</tbody>
</table>


Screening of colorectal cancer was introduced in 2006 to promote prevention and earlier detection of the disease. However, in all areas of the London Cancer Alliance (LCA), as is the case in England, the population uptake of screening is well below the target of 60%.

There are a number of barriers to early presentation, including patients being unaware of symptoms of suspected cancer or being slow to seek medical advice because they are either busy or embarrassed, or worried about what the doctor will find. Services may not be responsive enough, with long waits before undertaking investigations. The 2-week criteria have helped in speeding up the investigation for a group of patients with certain symptoms, but still over half of patients with colorectal cancers present via other routes and just over a quarter present as an emergency, which is associated with late-stage disease and worst outcomes.
The Colorectal Pathway Group and its multidisciplinary (MDT) members working with Transforming Cancer Services, NHS London and other interested organisations and stakeholders have identified the following priorities and actions to promote early diagnosis and increase the uptake of screening:

- Engaging with general practice to encourage sign-up to the data link with the screening hub
- Effective and timely sharing of information from the hub with general practice and clinical commissioning groups (CCGs) to enable GPs to encourage their patients to participate
- Encouraging GPs to respond to letters sent by the hub concerning non-participating patients by contacting them and explaining the benefits of screening
- Joint Advisory Group (JAG) accreditation of endoscopy units to ensure that capacity and quality concerns are addressed

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1 The failure of cancer medicine?, *The Lancet* 381(9865): 423, 9 February 2013
2 Primary Care Referrals

2.1 Expected referral patterns and prioritising appointments

The high prevalence of symptoms of bowel diseases in the community and in general practice means that identifying the few with bowel cancer can be very difficult. The National Institute for Health and Care Excellence (NICE) Referral Guidelines for Suspected Cancer 2005 aim to improve this selection process so that the majority of patients with higher risk symptoms are seen within 2 weeks. In April 2012, the Department of Health (DH) released guidelines for direct access flexible sigmoidoscopy, which primary care is expected to use. Finally, Transforming Cancer Services (TCS) in London, in conjunction with the London Cancer Alliance (LCA) and London Cancer (LC), has introduced a best-practice pathway for early detection of colorectal cancer. This involves a three-faceted approach, including referral guidelines for general practice. It is expected that diagnostic services in the LCA area will implement these guidelines following discussion and agreement with local CCGs.

2.2 Clinical assessment in primary care

All patients must have had a full history and thorough clinical examination, including rectal examination, before onward referral for investigation. Additionally:

- Consider full blood count (FBC), renal functions and ferritin where anaemia is suspected
- Faecal occult bloods and tumour markers (e.g. carcinoembryonic antigen (CEA)) in symptomatic patients are of little diagnostic value and should not be undertaken.

2.2.1 Higher risk (2 week) referral criteria

Only patients with new and persistent symptoms listed below should be referred via the fast-track system. Initially it was thought that these criteria would pick up 80–90% of all colorectal cancers presenting at outpatients. Based on the experience over the last 10 years, however, it is now accepted that they detect only 27%. These patients are referred under the 2-week rule (see Table 2.1).

Table 2.1: 2-week rule NICE referral guidance for colorectal symptoms

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Duration</th>
<th>Age</th>
<th>2-week referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG1 Rectal bleeding and change of bowel habit (looser stools and/or increased stool frequency)</td>
<td>&gt;6 weeks</td>
<td>&gt;40 years</td>
<td>Yes</td>
</tr>
<tr>
<td>LG2 Rectal bleeding alone (without change in bowel habit and without anal symptoms)</td>
<td>&gt;6 weeks</td>
<td>&gt;60 years</td>
<td>Yes</td>
</tr>
<tr>
<td>LG3 Change of bowel habit (looser stools and/or increased stool frequency)</td>
<td>&gt;6 weeks</td>
<td>&gt;60 years</td>
<td>Yes</td>
</tr>
<tr>
<td>LG4 Palpable intramural rectal mass</td>
<td>Any age</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>LG5 Low abdominal mass consistent with bowel involvement</td>
<td>Any age</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>LG6 Men – unexplained iron deficiency anaemia and a haemoglobin of 11g/dL or below</td>
<td>Any age</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>LG6 Women – non-menstruating with haemoglobin of 10g/dL or below</td>
<td>Any age</td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: NICE, 2005
The LCA recommends that general practitioners inform patients that they have symptoms suspicious of cancer, hence the urgent referral.

The LCA Colorectal Pathway Group is developing a model referral form for use across the LCA. Until this is agreed, urgent referrals should be made using the old cancer network forms (see Appendix 1).

2.2.2 Direct access flexible sigmoidoscopy criteria

These criteria are considered an extension of the 2-week rule criteria and specify that patients with these symptoms can be referred directly to a flexible sigmoidoscopy service or a one-stop diagnostic clinic:

- Patients aged 40 years and older with unexplained rectal bleeding persisting for at least 6 weeks. In other words, the age limit in criterion LG2 under the 2-week rule is brought down to 40 years from 60 years.
- Patients aged 55 years and older presenting with rectal bleeding of any duration. In other words, the age limit in criterion LG2 is brought to 55 years and the duration limit is abolished.

Furthermore, it is now suggested that the following group of patients are referred for specialist opinion to determine appropriate investigation:

Patients aged 40 years and older with a change in bowel habit to loose or more frequent stools for at least 6 weeks. In other words, the age limit for criterion LG3 has been brought down to 40 years.

2.2.3 Low-risk referral criteria

Patients with the following symptoms and no abdominal or rectal mass, are at very low risk of cancer and are therefore of lower priority:

- Rectal bleeding with anal symptoms such as soreness, discomfort, itching, lumps and prolapse as well as pain
- Rectal bleeding with obvious external cause, e.g. prolapsed piles or anal fissure
- Change in bowel habit to decreased frequency of defecation and harder stools
- Abdominal pain without clear evidence of intestinal obstruction, iron-deficient anaemia or palpable abdominal or rectal mass.

2.2.4 Urgent referral to normal clinic

- Patients with persistently low-risk symptoms, but with other worrying factors, such as a positive family history
- Patients who do not meet the urgent criteria but about whom there remain concerns.

2.2.5 Best-practice early detection pathway

The LCA and its colorectal MDTs are committed to the introduction and implementation of the best-practice early detection pathway for colorectal cancer developed by the LCA, London Cancer and Transforming Cancer Services NHS England (Appendix 15). The pathway includes a three-faceted approach to promote early detection, which involves the following:

- Primary care guidance for colorectal referral (guidance to GPs) with the aim of increasing referrals for diagnostics
• Increase bowel awareness with the aim of increasing participation in screening programmes
• A more responsive diagnostic service with the aim of investigating patients efficiently and appropriately.

However, this will require discussion between MDTs and local CCGs, which will be facilitated by the LCA and Transforming Cancer Services.

2.3 Point of referral

2.3.1 High risk

Referrals of patients with high-risk symptoms are usually made to the fast-track or 2-week rule clinic. Each Trust has a dedicated single referral centre to which these patients are referred. GPs are asked to fax referrals to a dedicated fax number for each referral centre within 24 hours of making a decision to refer. The central access point and telephone numbers are advertised by each Trust to its local GPs and are printed on the referral proforma.

2.3.2 Low risk

Referrals of patients with low-risk symptoms are usually made directly to the first available dedicated colorectal clinic that GPs choose or via Choose and Book. Sometimes patients choose not to be seen in the first available clinic but on a date that suits them. These bookings are made directly by GPs and their staff at the time of consultation with the patient.

2 Department of Health (2012) Direct Access to Diagnostic Tests for Cancer: Best Practice Referral Pathways for General Practitioners
4 Department of Health (2012) Direct Access to Diagnostic Tests for Cancer: Best Practice Referral Pathways for General Practitioners
3 Clinical Examination and Investigation

3.1 Clinical examination

- All patients seen in outpatients should have at least an abdominal and digital rectal examination as well as a rigid sigmoidoscopy.
- Vaginal examination should be considered as part of the assessment for rectal and anal cancer in women. For anal cancer, referral to a gynaecologist/colposcopy clinic is required.

3.2 Investigations for suspected colorectal cancer

3.2.1 Diagnosing colorectal cancer

Colonoscopy and computed tomography (CT) colonography (CTC) is the preferred method for making the initial diagnosis of primary colorectal carcinoma. However, colonoscopy and biopsy is required for confirmation. In some cases, particularly with acute presentations, this may not be possible.

- CTC is an acceptable alternative to colonoscopy for suspicious lesions where appropriate radiology and radiographic skills are in place.
- Where full colonoscopic evaluation is not possible, e.g. because of a stricture, CTC may be used pre-operatively or colonoscopy undertaken within 6 months post-operatively to exclude synchronous lesions or adenomatous polyps.
- Gastroscopy should be included in patients with iron-deficient anaemia.
- Flexible sigmoidoscopy should be considered for fresh rectal bleeding alone and in younger patients (<55 years old). It should also be considered when direct access services exist following the Department of Health (DH) guidance of 2012. If a cancer or adenomatous polyps are found, full colonic evaluation with colonoscopy or CTC is required.
- CT alone, with or without contrast depending on renal functions, may be considered in certain patients who would not tolerate more invasive investigations, e.g. those who are very elderly or infirm.
- Pre-operative histology should be obtained from all rectal and colonic tumours. Histological confirmation of the diagnosis is usually achievable in the majority of cases (>90%). In exceptional circumstances where histology cannot be obtained for technical reasons, the decision on surgery or chemo-radiotherapy should be discussed in the multidisciplinary team (MDT).
- Endoscopy units should conform to the quality standard set down by the recent documentation for the British Society of Gastroenterologists and to achieve Joint Advisory Group (JAG) accreditation.
- If colonoscopy or CTC is incomplete or equivocal, there should be an agreed and documented feed back to the MDT to consider alternative procedures.
- The hospital clinician under whose care the patient is being investigated is responsible for the patient from diagnosis until the MDT plans treatment.
- The hospital radiologist/gastroenterologist performing investigations is responsible for bringing results of investigations to the MDT.
- Unsuspected cancers found during the course of radiological/endoscopic or pathological examinations will be reported by email to the MDT coordinator and the colorectal clinical nurse specialist (CNS) or to a generic email address (using a read receipt) by the investigating physician, radiologist or pathologist.
• The patient’s GP will be informed immediately of the endoscopy/CTC findings whether or not a colorectal cancer is confirmed histologically. This may be in the form of a faxed endoscopy/radiology report.

3.2.2 Pre-operative assessment of the stage of newly diagnosed colorectal cancer

Staging of rectal cancers only

The purpose of staging rectal cancers is to determine their suitability for primary curative surgery or alternatively for down-staging pre-operative neo-adjuvant therapy.

• CT and magnetic resonance imaging (MRI) scanning should be undertaken to determine:
  – The local extent of the tumour. Is it limited to the bowel wall or does it extend beyond the mesorectum or adjacent organs?
  – The presence of high-risk features such as extramural venous invasion (EMVI), involvement of the circumferential resection margin (CRM) or involvement of the peri-rectal lymph nodes.

The LCA is committed to standardised reporting of CT and MRI scans. The aim is to reduce the variation in reporting and improve the accuracy of staging the disease with the consequence of better tailored treatment

• Transrectal endosonography (TRUS) is not essential but may be used where available to determine the depth of penetration where clinical examination or the MRI suggests that local excision (T1 and T2 lesions) may be feasible, particularly with the TREC (Transanal Endoscopic Microsurgery and Radiotherapy in Early Rectal Cancer) trial.

Staging of colonic cancers only

As with rectal cancer, the purpose of staging colonic cancers is to determine their suitability for primary curative surgery or alternatively for down-staging pre-operative adjuvant therapy.

CT scanning of the abdomen and pelvis should be undertaken to determine:

• The local extent of the tumour
• Involvement of the peri-rectal lymph nodes.

Assessment of the chest and liver for metastases for rectal and colonic cancers

Although there are some patients who will benefit from open surgery regardless of whether there is disseminated disease, the avoidance of pre-operative staging should be the exception rather than the rule.

• A chest CT scan is the ideal and standard method of identifying pulmonary metastases for all newly diagnosed colorectal cancer patients within the LCA.

• CT scan of the abdomen is the ideal method of investigating and detecting liver metastasis for all newly diagnosed colorectal cancer patients within the LCA. In equivocal cases, an MRI scan of the liver should be considered.

• An MRI of the liver is indicated prior to undertaking liver and lung resections for surgically resectable metastasis (see Appendix 5).
# Imaging

## 4.1 Colon cancer

Table 4.1: Colon cancer diagnosis, staging and surveillance – imaging modality and indications

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Imaging modality</th>
<th>Indications and notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnosis</strong></td>
<td>Colonoscopy and biopsy, Computed tomography (CT) colonography (CTC)</td>
<td>Patients with symptoms suggestive of colorectal cancer should generally be referred for either colonoscopy or CTC, according to local availability and expertise. Flexible sigmoidoscopy is an alternative where patients present with rectal bleeding and without systemic symptoms. Barium enema should no longer be offered as an alternative test owing to its inferior accuracy and poor patient experience. Colonoscopy and CTC should be provided by services that adhere to national guidelines on best practice, with audited data to provide retrospective analysis of diagnostic performance. Polyps &gt;1cm identified by colonoscopy should be tattooed at the time of endoscopic removal. Larger polyps or early cancers not suitable for endoscopic removal that require surgery should also be tattooed to facilitate identification at operation. This is especially necessary if surgery is carried out laparoscopically. British Society of Gastroenterology guidance will be followed. Where cancer is identified by CTC, same-visit CT staging and endoscopic biopsy is recommended where deemed appropriate and safe.</td>
</tr>
</tbody>
</table>

| Staging | CT thorax, abdomen and pelvis | All patients diagnosed with colon cancer should be staged using CT. Where cancer has been diagnosed by CTC, this examination should utilise intravenously administered contrast and chest CT at the same visit where deemed appropriate. CT will help identify those patients who are likely to benefit from pre-operative chemotherapy +/- radiotherapy and complex cancer cases, for example tumours that infiltrate adjacent structures or with other adverse prognostic features. Imaging will help to:  
- Determine the size and local extent of the tumour and degree of pericolic infiltration  
- Identify any extension of the tumour into adjacent structures such as the abdominal wall, peritoneum or solid organs  
- Identify complications such as the presence of a bowel obstruction or perforation |


<table>
<thead>
<tr>
<th>Imaging modality</th>
<th>Indications and notes</th>
</tr>
</thead>
</table>
| Positron emission tomography (PET) | • Note the presence and extent of local pericolic nodal enlargement and detect more distant nodal metastases. Nodes in the retro-peritoneum, pelvis and inguinal regions are considered to be metastatic  
• Identify the extent of metastatic disease in distant organs including the lungs and liver.  
The main role of PET CT is:  
1. For staging prior to consideration of lung or liver resection for secondaries or prior to consideration of pelvic exenteration for locally advanced primary rectal cancer or recurrent colorectal cancer  
2. To establish the cause of rising tumour markers in known colorectal cancer patients when conventional imaging has failed.                                                                                                                                                                                                 |
| Surveillance                  | Follow-up is undertaken routinely according to local protocol and between interval surveillance scans when there is suspicion of recurrent disease, e.g. elevation of carcinoembryonic antigen (CEA) levels. CEA levels should be performed as a baseline prior to chemotherapy. Routine follow-up should be applied only to patients who:  
• would be fit for intervention if recurrence is diagnosed, and  
• have received potentially curative surgery.  
Annual CT for 3 years.                                                                                     |
4.2 Rectal cancer

<table>
<thead>
<tr>
<th>Table 4.2: Rectal cancer diagnosis, staging and surveillance – imaging modality and indications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imaging modality</strong></td>
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<tr>
<td>---------------------------------------</td>
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<tr>
<td><strong>Diagnosis</strong></td>
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<tr>
<td>Colonoscopy and biopsy (and flexible sigmoidoscopy)</td>
</tr>
<tr>
<td>CTC</td>
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<tr>
<td><strong>Staging</strong></td>
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<tr>
<td>CT thorax, abdomen and pelvis</td>
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<tr>
<td>Magnetic resonance imaging (MRI) rectum</td>
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<tr>
<td>PET</td>
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<td><strong>Surveillance</strong></td>
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<td>As Table 4.1</td>
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### Table 4.3: CT scanning technique and parameters

<table>
<thead>
<tr>
<th>Technique</th>
<th>Area scanned</th>
<th>Oral contrast</th>
<th>IV contrast vol/sec</th>
<th>Delay(s)</th>
<th>Max slice thickness</th>
<th>Windows</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>Thorax, abdomen and pelvis</td>
<td>Water, 1L</td>
<td>100–150ml of intravenous iodinated contrast medium, injected at 3–4 ml/sec</td>
<td>20–25 seconds (chest) and 70–80 seconds (abdomen and pelvis) post-injection</td>
<td>3mm</td>
<td>Soft tissue and lung windows</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4.4: MRI scanning technique and parameters

<table>
<thead>
<tr>
<th>MRI</th>
<th>Area</th>
<th>Sequence</th>
<th>Plane</th>
<th>Slice thickness</th>
<th>Field of View</th>
<th>Matrix size (pixels)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvis</td>
<td>Rectum and mesorectum</td>
<td>T2 weighted fast spin-echo (T2W-FSE)</td>
<td>Sagittal</td>
<td>5mm</td>
<td>FOV 25cm x 20cm</td>
<td>521x256</td>
<td>To localise tumour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2W-FSE</td>
<td>Axial</td>
<td>5mm</td>
<td>Large</td>
<td>521x256</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2W- FSE</td>
<td>Oblique axial perpendicular to rectal wall</td>
<td>3mm</td>
<td>Small FOV 16x16cm</td>
<td>256x256</td>
<td>To define tumour spread</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T2W- FSE</td>
<td>Coronal sequence parallel to anal canal for low rectal cancers Further coronal sequence to ensure coverage of mesorectum up to L5/S1</td>
<td>3mm</td>
<td>Small FOV 16x16cm</td>
<td>256x256</td>
<td>To define tumour spread</td>
</tr>
</tbody>
</table>
4.3 Standardised reporting for MRI scan for rectal and anal cancers

The pathway group have discussed and agreed to standardise the reporting of MRI scans for rectal cancers. Accurate reporting will ensure that patients with primary rectal cancers receive the correct treatment whether by surgery or neoadjuvant therapy as the initial treatment approach and those cancers that remain locally advanced are referred for treatment beyond TME. The agreed data set is as follows:

I. Standard report for all rectal cancers

**Primary tumour**

The primary tumour is demonstrated as an [Annular | Semi-annular | Ulcerating | Polypoidal | Mucinous] mass with a [nodular / smooth] infiltrating border

The distal edge of the luminal tumour arises at a height of [ ] mm from anal verge

The distal edge of the tumour lies [ ] mm [above, at, below] the top of the puborectalis sling

The tumour extends craniocaudally over a distance of [ ] mm

The proximal edge of tumour lies [above, at, below] the peritoneal reflection

Invading edge of tumour extends from [ ] to [ ] o’clock

Tumour is [confined to] [extends through] the muscularis propria:

Extramural spread is [ ] mm

Tumour is [present] [not present] the level of the puborectalis sling at this level

If present: one of the following needs to be noted:

- [Tumour is confined to the submucosal layer / part thickness of muscularis propria indicating that the intersphincteric plane / mesorectal plane is safe and intersphincteric APE or ultra-low TME is possible]
- [Tumour extends through the full thickness of the muscularis propria: intersphincteric plane / mesorectal plane is unsafe, extralevator APE is indicated for radial clearance]
- [Tumour extends into the intersphincteric plane: intersphincteric plane / mesorectal plane is unsafe, therefore an extralevator APE is indicated for radial clearance]
- [Tumour extends into the external sphincter: intersphincteric plane / mesorectal plane is unsafe]
- [Tumour extends into adjacent [prostate / vagina / bladder / sacrum / pelvic sidewall]: exenterative procedure will be required]

**mrt stage:**

[T1] [T2] [T3a] [T3b] [T3c] [T3d] [T4 visceral] [T4 peritoneal]

**Lymph node assessment**

Only benign reactive and no suspicious nodes shown [N0]

[number] mixed signal / irregular border nodes [N1 / N2]
Extramural venous invasion:

[No evidence] [Evidence]

[ ] Small 1–2mm veins only
[ ] Medium
[ ] Large vein invasion is present – e.g. superior rectal vein, inferior rectal vein or middle rectal vein branches

CRM

The closest circumferential resection margin is at [ ] o’clock

The closest CRM is from [direct spread of tumour] [extramural venous invasion] [tumour deposit]

Minimum tumour distance to mesorectal fascia: [ ] mm [CRM clear] [CRM involved]

Peritoneal deposits: [No evidence] [Evidence]

Pelvic side wall (PSW) lymph nodes:

[None] [Benign] [Malignant mixed signal / irregular border]

Location: [Obturator fossa • R • L] [External Iliac Nodes • R • L] [Internal iliac • R • L]

Summary

MRI overall stage: T N M, [CRM positive] [CRM negative] [EMVI positive] [EMVI negative], [PSW positive] [PSW negative]

Radiologically eligible for [state relevant] trial
II. Additional report for locally advanced (T4) and recurrent rectal cancers:

Tumour involves / does not involve the central compartment

**Above the peritoneal reflection within the pelvis**

Tumour is present / absent

Ureters are free of tumour

**Below the peritoneum anteriorly**

Bladder / uterus / vagina / ovaries / prostate / seminal vesicles / urethra are free of tumour

**Posteriorly**

The bony cortex / periosteum from S1–S2 is / is not involved by tumour

The bony cortex / periosteum from S3–S5/coccyx is / is not involved by tumour

Presacral fascia [S1 / S2 / S3 / S4 / S5] is not involved by tumour

**Sciatic nerve/S1/S2 nerve roots**

No tumour

Tumour is present

**Laterally**

Pelvic fascia are free of tumour

Pelvic sidewall compartment are free of tumour

Internal / external iliac arterial / venous branches are free of tumour

Sacrotuberous / sacrospinous

Piriformis / obturator

**Infralevator compartment**

Levator muscles are free of tumour

Sphincter complex are free of tumour

**Anterior urogenital triangle / perineum**

Vaginal introitus / urethra: free of tumour

Retropubic space: free of tumour

**Summary**

MRI overall stage: T N M, [EMVI positive] [EMVI negative], [PSW positive] [PSW negative]

Total number of compartments involved by tumour [n]

Closest potential surgical margins are located at [

Resection would require [ ]
III. Baseline assessment of squamous cell carcinoma of the anorectum

The primary tumour is demonstrated as an [Annular / Semi-annular / Ulcerating / Polypoidal / Mucinous] mass with a [nodular / smooth] infiltrating border.

The distal edge of the luminal tumour arises at a height of [ ] mm from anal verge.

The tumour extends craniocaudally over a distance of [ ] mm.

The tumour involves the circumference of the rectum from [o’clock to the o’clock position].

Tumour is [confined to] [extends through] the muscularis propria.

Extramural spread is [ ] mm at the o’clock position.

**mrT stage:**

[Tx] [T1, <2cm] [T2 2–5cm] [T3 >5cm] [T4 visceral]

**Lymph node assessment**

**Mesorectal nodes**

Only benign reactive and no suspicious nodes shown.

[number] mixed signal/irregular border nodes in the mesorectum only.

**Pelvic side wall lymph nodes:**

[None] [Benign] [Malignant / mixed signal / irregular border]

Location: [Obturator fossa • R •L] [External iliac Nodes • R •L] [Internal iliac • R •L]

**Inguinal nodal territory**

Only benign reactive and no suspicious nodes shown.

[number] mixed signal/irregular border nodes in the mesorectum only [N2].

**Overall nodal status:**

No nodal disease: N0

Perirectal nodal disease only: N1

Unilateral inguinal and/or pelvic sidewall nodes: N2

Bilateral inguinal/pelvic sidewall or perirectal plus inguinal/pelvic sidewall N3

**Summary:**

MRI overall stage: T N M
4.4 Standardised CT reporting for colon cancers

**Primary tumour**

The primary tumour is demonstrated as an [annular / ulcerating / polypoidal / villous / eroding / mucinous] mass and has a [nodular / smooth] infiltrating border

The primary mass is located in [caecum / ascending colon / hepatic flexure / transverse colon / splenic flexure / descending colon / sigmoid]

The advancing edge tumour (border) is [mesenteric / peritoneal]

Tumour [is confined to / extends through] the bowel wall.

Localised peritoneal infiltration: [no evidence / evidence]

Tumour extension: [<5mm / >5mm]

Extramural tumour spread measures [] mm.

Tumour diameter: [ ] mm. Tumour thickness: [ ] mm.

There is [evidence / no evidence] of radiological obstruction / perforation

**Lymph nodes in colonic mesentery:**

Benign/reactive nodes only [N0]

Malignant enhancing irregular nodes present [N1/N2].

Number visualised:

**Extramural venous invasion**

There is [evidence / no evidence] of extramural venous invasion: nodular spread into small vessel / spread along a large vein

There is [evidence / no evidence] of peritoneal dissemination

**Distant spread**

Retroperitoneal lymphadenopathy is [absent / present]

Incidental note is made of [intra-abdominal pelvic] pathology

There is [evidence / no evidence] of metastatic disease in liver

There [is / no] segmental sparing

Incidental note is made of [cysts / haemangioma /equivocal low density lesion] that [requires characterisation by MRI / is recommended for follow-up / is unlikely to represent metastatic disease]

Pulmonary metastatic disease: [No] CT evidence. Details: [ ]

**Summary**

Overall CT stage: T [] N [] M [] [resectable / irresectable] EMVI [positive / negative]

Radiologically eligible for [state relevant] trial
5 The Multidisciplinary Team

Colorectal cancer care in the London Cancer Alliance (LCA) is delivered through a multidisciplinary team (MDT)-based approach. A treatment plan will be formulated by team members in conjunction with the patient.

There is evidence to suggest that critical mass is important in terms of outcome in cases of rectal cancer, while such evidence is less robust for colon cancer. The peer review standards advocate that each unit treating colorectal cancer should see a minimum of 60 new cases of colorectal cancer per year. Individual core member surgeons must carry out a minimum of 20 operative procedures with a curative intent a year.

There are several MDTs that deliver the service, depending on the nature of the condition:

- Colorectal cancer MDT
- Early rectal cancer MDT
- Specialist advanced pelvic cancer MDT
- Specialist anal cancer MDT
- Liver/hepatobiliary (HPB) specialist MDT
- Lung MDT.

5.1 Colorectal cancer MDT

5.1.1 Membership

The MDT will be composed of core and extended teams of specialists and associated staff with interest in the management of colorectal cancer. The core membership of these teams will be as follows.

**Core team**

- Two colorectal surgeons
- Clinical oncologist who takes responsibility for radiotherapy for rectal carcinoma
- Oncologist who takes responsibility for chemotherapy
- Imaging specialist
- Consultant histopathologist (EQA accredited)
- Colorectal nurse specialist
- MDT coordinator/secretary
- Colonoscopist of any of the following disciplines: surgeon, physician or specialist nurse
- NHS-employed member (a member of either the core or extended team) with responsibility for user issues
- Member of the core team nominated to be responsible for clinical trials
- At least one clinical core member should have completed the necessary training to practice at Level 2 for psychological support of cancer patients and carers.
Extended team

The extended team may include any of the following roles:

- Gastroenterologist
- Core surgical member of the HPB MDT
- Thoracic surgeon who has practice in lung metastatectomy
- Interventional radiologist
- Colorectal/stoma nurse
- Palliative care nurse
- Nurse specialist GI oncology
- Counsellors/clinical psychologists
- Data manager
- Pain relief nurse
- Nutritional support/dietitian
- Social services
- Research nurse
- Patient advocacy services
- Complementary services (e.g. massage, aromatherapy)
- Clinical geneticist
- Bowel cancer screening unit nurses.

5.1.2 The meeting

- All newly diagnosed patients with colorectal cancer are discussed at the MDT meeting. Moreover, any patient with colorectal cancer requiring a management plan (irrespective of being a new presentation, post-operative or a follow-up presentation) should also be discussed.

- The consultant in charge, clinical nurse specialist (CNS) or registrar should complete the referral of the case to be discussed at the MDT meeting, which is then emailed or faxed to the colorectal MDT coordinator/pathway navigator.

- Referrals should contain a short history, clinical findings, performance status, co-morbidities and the reason for discussion.

- The MDT will meet once a week to allow timely decision making on all colorectal cancer patients, but this may vary depending on the workload in each unit.

- Meetings should include a register of attendance.

- Records of cases discussed and decisions made must be documented in case notes, in a standard fashion, either on an LCA-approved MDT proforma or electronically. MDTs are encouraged to adopt systems that enable live electronic recording of MDT outcomes at MDT meetings.

- Recorded outcomes should include the staging of the tumour, either radiological staging by computed tomography (CT) or magnetic resonance imaging (MRI), or the final integrated stage using histological and radiological staging as well as the plan of management.
5.1.3 After the meeting

Patients and their carers will be invited to attend the clinic, ideally within 48 hours of the MDT meeting discussion if possible. They will meet the consultant, CNS or registrar who will communicate the recommendations of the MDT meeting, discuss next steps and invite them to give their views on the proposed treatment. The core team aims to maintain close contact with the other professionals involved in caring for the cancer patient. This includes prompt communication (within 24 hours of informing the patient of the diagnosis) with the patient’s GP and, where appropriate, the palliative care team.

Written and verbal information will be provided for patients about their disease and they will be given the name of a key worker (see the Key Worker Policy in Appendix 6). This person will be the first point of contact for patients wishing to access any information about their condition, treatment and so on. The key worker should be present at the appointment when patients are informed of their diagnosis. In addition, information will be given to patients about transfer of care from one member of the team to another, for example, from a surgeon to an oncologist.

5.2 Early rectal cancer MDT

The early rectal cancer (ERC) MDT acts as a standalone MDT and includes members who have specific interest in the management of early rectal cancer in addition to having colorectal specialist expertise. The meeting may be held after the standard colorectal cancer MDT or separately, depending on local logistics. The MDT should comply with NHS England service specifications currently under development.

The ERC MDT meets weekly.

Membership of the ERC MDT will include members with similar roles to the colorectal core and extended MDT teams. In particular, the MDT should have the following expertise as part of the core MDT:

- Two surgeons trained in transanal endoscopic procedures
- Lead radiologist
- Lead pathologist
- Clinical/Medical oncologist
- CNS (including Macmillan link nurse)
- Colonoscopist.

A representative from the unit MDT may choose to attend the ERC MDT to present the patient they referred over from their unit. Patients are referred to the ERC MDT as per the agreed referral process.

The same standards that apply to the colorectal cancer MDT will also apply to the ERC MDT.

All patients with possible T1 lesions (on the basis of clinical and MRI parameters) should be referred for high frequency endosonography or where experience exists, as in many units in the LCA, for a high resolution MRI. All suitable patients should then be referred to one of the MDTs agreed as specialising in local resection.
5.3 Specialist advanced pelvic cancer (locally advanced/local recurrence rectal cancer) MDT

The specialist advanced pelvic cancer MDT acts as a standalone MDT and includes members who have specific interest in the management of locally advanced and local recurrence of rectal cancer in addition to having colorectal specialist expertise. The meeting may be held after the standard colorectal cancer MDT or separately, depending on local logistics. The MDT should comply with NHS England service specifications currently under development.

The specialist advanced pelvic cancer MDT meets regularly.

Membership of the MDT will include members with similar roles to the colorectal core and extended MDT teams. In particular, the MDT should have access to the following expertise:

- Two colorectal surgeons experienced in undertaking distal sacrectomy procedures
- Urological, gynaecological, neuro/orthopaedic and oncoplastic surgical input
- Lead radiologist
- Lead pathologist
- Clinical/Medical oncologist
- CNS (including Macmillan link nurse)
- Clinical pharmacist
- Theatre support staff
- Two anaesthetists
- Stoma therapy service
- National Institute for Health and Care Excellence (NICE)-compliant nutrition support team (with total parenteral nutrition (TPN) capability comprising at least dietitian, pharmacist, nutrition nurse specialist and consultant medic)
- Data manager – with a particular focus on audit and outcomes.

A representative from the unit MDT may choose to attend the Specialist Advanced Pelvic Cancer MDT (ERC) to present the patient they referred over from their unit. Patients are referred to this MDT as per the agreed referral process.

The same standards that apply to the colorectal cancer MDT will also apply to the specialist advanced pelvic cancer MDT.

5.4 Liver resection/hepatobiliary specialist MDT

The HPB specialist liver resection MDT acts as a standalone MDT and includes members with an interest in the management of malignant liver conditions.

The HPB MDT meets once a week.

Membership of the MDT includes HPB surgeons, oncologists, radiologists and pathologists as well as clinical and non-clinical members with roles similar to the colorectal core and extended MDT teams.
All patients with potentially resectable liver metastases agreed by liver surgeons at the MDT will be referred to the HPB MDT for assessment and further management. (In these cases, the resectability is personal and there is no strict contraindication for surgery except poor liver functional reserve, major vascular involvement, or deemed unfit for surgery, e.g. high anaesthetic risk.) Normally, these patients will be discussed initially at the colorectal MDT. Invariably their condition will have been detected as part of staging a newly diagnosed colorectal cancer or detected during routine follow-up of patients who have been treated for the disease.

When liver secondaries are noted and are deemed to be resectable (e.g. solitary lesions), and where they meet the agreed guidelines for referral or where an opinion on suitability for surgical resection is required, the patients will be referred to the HPB MDT for discussion as per the agreed referral process. If, at the HPB MDT, the patient is deemed to have potentially resectable liver metastasis, they will remain under the care of the HPB MDT until a satisfactory conclusion of the process is reached. If the patient is deemed not to have resectable liver lesion, the patient returns to the colorectal resection MDT.

All Trusts referring into tertiary care use the agreed Inter-Trust Referral protocol (Appendix 7).

For details of therapy or adjuvant down-staging therapy, see the guidance in Appendix 8.

5.5 Lung MDT

The lung MDT is a standalone MDT that normally discusses lung cancers and has its own constitution and operating policy for this tumour type. However, lung secondaries that are potentially resectable should be referred to this MDT for an opinion from a lung surgeon about feasibility and timing of a surgical resection. For further details, please refer to the LCA Lung Cancer Clinical Guidelines available at [www.londoncanceralliance.nhs.uk/media/62369/Lung%20Cancer%20Clinical%20Guidelines%20041213%20FINAL%20REV.pdf](http://www.londoncanceralliance.nhs.uk/media/62369/Lung%20Cancer%20Clinical%20Guidelines%20041213%20FINAL%20REV.pdf)

5.6 Specialist anal cancer MDT

Please refer to Chapter 16.

5.7 Referral for colorectal cancer within secondary or to tertiary care within or outside the LCA

It is recognised that most colorectal cancer will be managed by local MDTs. However, following discussions at the local MDT, if a further opinion is required at another MDT within or outside the LCA, the following guidelines should be followed.

5.7.1 Referral for early rectal cancer (T1 tumours <3cm in diameter)

- If an early rectal cancer (ERC) is diagnosed at any Trust within the LCA and is suitable for local resection with transanal endoscopic microsurgery (TEMS) (see criteria, Appendix 2), the patient should be referred to a unit that hosts an ERC MDT and undertakes TEMS. The consultant in charge, clinical nurse specialist (CNS) or registrar should complete the referral and fax to the ERC MDT coordinator of the receiving unit.
- The patient’s clinical letters, imaging and histopathology should be sent to the ERC MDT for review at their meeting within the week.
- The consultant, CNS or registrar referring the patient should inform the patient of the diagnosis and of the onward tertiary referral.
5.7.2 Referral of a complex locally advanced colorectal cancer (T4 tumours involving adjacent organs)

- If a locally advanced colorectal cancer is diagnosed at any Trust within the LCA, which requires referral to another MDT, e.g. the specialist advanced pelvic cancer MDT, the consultant in charge, the CNS or the registrar should complete the referral proforma and fax to the relevant MDT coordinator.
- The patient’s clinical letters, imaging and histopathology should be sent to the relevant clinician/specialised colorectal MDT within 7 days.
- The consultant referring the patient, the CNS or the registrar should inform the patient of the diagnosis and of the onward tertiary referral.

5.7.3 Referral of a locally recurrent colorectal cancer

- If a locally recurrent colorectal cancer is diagnosed at any Trust within the LCA, this should be referred to the specialist advanced pelvic cancer MDT, held at one of the four designated local recurrence centres for the LCA. The consultant in charge, the CNS or the registrar should complete the referral proforma and fax to the relevant local recurrence MDT coordinator.
- The patient’s clinical letters, imaging and histopathology should be sent to the local recurrence MDT for review at their meeting within the week.
- The consultant referring the patient, the CNS or the registrar should inform the patient of the diagnosis and of the onward tertiary referral.

5.7.4 Referral of patients with liver and lung metastasis

- If a patient with liver or lung deposits is diagnosed at any Trust within the LCA, they should be referred to one of the LCA designated liver resection/hepatobiliary (HPB) MDTs or lung MDTs. The consultant in charge, the CNS or the registrar should complete the referral proforma and fax to the relevant MDT coordinator.
- The patient’s clinical letters, imaging and histopathology should be sent to the MDT for review at their meeting within the week.
- The consultant referring the patient, the CNS or the registrar should inform the patient of the diagnosis and the onward tertiary referral.
- If at a liver or lung resection MDT the patient is deemed to have potentially resectable liver or lung deposits, they will remain under the care of the respective MDT until a satisfactory conclusion of the process is reached. If the patient is deemed not to have resectable liver or lung lesions, the patient will return to the original colorectal resection MDT.
- In the case of suspected lung metastasis, the presence of limited or solitary pulmonary nodules may represent synchronous primary tumours or benign disease. Lung MDT discussion may help guide management, especially if pulmonary metastasectomy is being considered by the colorectal MDT.

5.7.5 Referral of patients to tertiary centres for non-surgical oncology treatment

- If a patient is required to be referred for non-surgical oncology treatment by radiotherapy or chemotherapy, the patient should be referred to the appropriate team at the local cancer centre. The consultant in charge, CNS or registrar should complete the referral and fax to the MDT coordinator of the receiving tertiary centre.
- The patient’s clinical letters, imaging and histopathology should be sent to the receiving consultant or the team, within the week.
The consultant, CNS or registrar referring the patient should inform the patient of the diagnosis and of the onward tertiary referral.

1 All histopathologists reporting on lower GI cancers should take part in the National GI EQA scheme.
6 Surgical Management

The surgical management of patients should be in accordance with the *Guidelines for the Management of Colorectal Cancer* from the Association of Coloproctology of Great Britain and Ireland (ACPGBI). Surgery for colorectal cancer should be avoided if the hazards are deemed to outweigh the potential benefits – that is, if the patient is medically unfit for surgery or has advanced disease that is not amenable to surgical therapy. In making such a decision, it is important to involve the patient and/or close relatives so that the underlying reasoning is clear and acceptable to all concerned.

Laparoscopic surgery must be available in each unit and an enhanced recovery programme should be in place in all units.

Early rectal cancer may be suitable for local excision or transanal endoscopic microsurgery (TEMS) (see later) and referral to appropriate units considered.

Where elective surgery is indicated, this should be scheduled within 4 weeks of the confirmation of diagnosis (within 62 days of initial referral by the GP if the patient is under the 2-week rule).

6.1 Preparation for surgery

The following fundamental aspects should be adhered to:

- **Pre-operative anaesthetic assessment** – a multidisciplinary assessment should be undertaken, assessing and modifying risk factors, nutrition status and social needs.

- **Informed consent** – consent is needed from the patient or their close relative if the patient is unable to give this. Ideally, consent should be obtained by the surgeon or a doctor who fully understands the nature of the operation and can answer questions and explain risks of death and morbidity, functional results, stoma and risk of urinary problems and impotence after rectal surgery. The consent should be obtained in the clinic when the decision for surgery is discussed with the patient, or on the day the patient is added to the waiting list, or when a date for surgery is agreed. Patient information should be provided at initial diagnosis and throughout the pathway.

- **Preparation for stoma formation** – patients requiring a stoma should be seen by a stoma nurse prior to surgery. Referral should be made at the earliest opportunity to allow adequate time for preparation. The nature and consequences of this should be carefully explained and the site marked prior to surgery to ensure optimum fitting of the appliance. In keeping with the 2013 National Bowel Cancer Audit Programme (NBOCAP) audit recommendations, patient counselling information for a temporary ileostomy should include a non-closure rate of 30%, a median closure delay of 7 months for those that are closed, and an approximately 10% chance of death with a non-reversed intestinal stoma at 18 months.

- **Anal sphincter function** – patients undergoing low anterior resections should have anal sphincter tone assessed prior to surgery. Patients with poor sphincter function may become incontinent after the surgery and must be warned of this. If appropriate, stomas should be considered.

- **Cross-matching** – blood should not be withheld if there is a clinical indication to give it. Preparations for blood transfusion should be made in all patients undergoing surgery for colorectal cancer except where an individual patient refuses. Formal cross-matching is recommended in extensive operations, especially rectal resections.
• Bowel preparation – mechanical bowel preparation and the type of preparation before elective colorectal surgery is left to the individual surgeon’s preference.

• Thromboembolism prophylaxis – patients undergoing surgery for colorectal cancer are at risk of deep vein thrombosis (DVT) and pulmonary embolism. Unless contraindicated, TEDS, heparin and/or intermittent compression should be used to cover the surgery for colorectal cancer. Extended prophylaxis with heparin for 28 days following major bowel surgery as per National Institute for Health and Care Excellence (NICE) guidelines should be strongly considered.

• Antibiotic prophylaxis – prophylactic antibiotics should be given to all patients undergoing surgery for colorectal cancer as there is good evidence that this can decrease morbidity and shorten hospital length of stay.

6.2 Surgery for colon and rectal cancers

6.2.1 Curative resection

The term curative resection should be based on histological confirmation of complete excision or residual tumour. Surgeons across the LCA should aim to achieve an overall curative resection rate of 60%, but it is appreciated that this will depend on the stage at which patients present.

6.2.2 Colonic tumours

Radical segmental resection or sub/total colonic excision with lymphadenectomy should be performed to achieve cure where possible according to accepted surgical practice.

6.2.3 Rectal tumours

Total mesorectal excision (TME) should be performed for tumours in the lower two thirds of the rectum, either as part of a low anterior resection or an abdomino-perineal excision of the rectum (APER). In tumours of the upper rectum, the mesorectum should be divided no less than 5cm below the lower margin of the tumour. Care should be taken to preserve the pelvic autonomic nerves and plexuses, and perforation of the tumour during operation should be avoided.

For low rectal cancers, if distal clearance of 1cm can be achieved, the cancer may be suitable for anterior resection. Height of tumour is not the only factor that should be considered. Also consider patient factors such as age, sphincter function and potential bowel function. For example, patients with tumours that would be technically amenable for a low anterior resection may be better served by an APER if the sphincter function is weak and they are likely to suffer from troublesome incontinence. It is important that these issues are discussed with patients and their relatives and a final decision is made about the surgical approach. However, the overall proportion of rectal cancers treated by APER should be less than 25% depending on stage of disease at presentation. If surgeons have any doubt regarding the choice between these two operations, an experienced second opinion should be sought in the MDT meeting.

Extralevator abdomino-perineal excision (ELAPE) is an operation that involves removal of the anus and rectum by dividing the levator muscles close to the pelvic sidewall. This creates a cylindrical surgical specimen as opposed to the usual wasting seen at the level of the levator during standard APER. The indication for this surgery is usually tumours of the lower third of the rectum that are either invading or lying in close proximity to the levator muscles.
6.2.4 Anastomosis

- Cytocidal washout of the rectal stump prior to anastomosis should be used to reduce the risk of anastomotic recurrence.
- The anastomotic technique is left to the individual surgeon as long as leakage rates are low and well below 10%.
- In colonic anastomoses, the interrupted sero-submucosal method has the lowest reported leak rate. Stapling devices may be used according to surgeons' preferences.
- In rectal anastomoses, stapling is the technique of choice as it facilitates ultra-low pelvic anastomoses.
- After anterior resection and TME, the judicious use of a temporary de-functioning stoma is recommended, and the formation of a colonic pouch should be considered.

6.3 Laparoscopic surgery

All patients with colorectal cancer should be offered the choice of surgery using laparoscopic techniques, where appropriate. It is accepted that all colorectal MDTs in the London Cancer Alliance (LCA) will include at least one fully trained laparoscopic surgeon.

Most colorectal tumours are suitable for laparoscopic surgery, except in cases where:

- The tumour is staged as T4 on computed tomography (CT)/magnetic resonance imaging (MRI)
- There is an obstruction present clinically or radiologically
- Tumours are >10cm in diameter, or
- Patients have a body mass index >30.

It must be stressed that those are not absolute contraindications as there is a body of evidence to support laparoscopic surgery in all stages of colon cancer in contemporary clinical practice. The presence of adhesions from previous surgery and rectal tumours are not necessarily a contraindication.

6.4 Local surgery for early rectal cancer

See Appendix 2.

In the LCA, there are four approaches to local excision of early rectal cancers:

- Parks transanal rectal excision – performed by all MDTs
- Transanal endoscopic microsurgery – performed by designated MDTs
- Endoscopic mucosal dissection – performed by designated MDTs
- Endoscopic submucosal dissection – performed by designated MDTs.

Treatment with an intention of cure is offered to patients with favourable tumours that are at low risk of recurrence. Suitable tumours are those staged pre-operatively as T1 SM1 (Kikuchi classification) well differentiated adenocarcinomas measuring <3cm in diameter and with no lympho-vascular invasion.

Most often, T1 SM1 tumours are identified pre-operatively by MRI and endorectal ultrasound, both of which have a reported accuracy of 70–95%.

However, given that it is not always possible to identify T1 SM1 tumours prior to surgery, favourable tumours (T1, <3cm in diameter, wel- differentiated cancers with no lympho-vascular invasion) are
approached by one of the above treatment modalities with the intention of obtaining definitive histology – ‘the big biopsy approach’. As long as an R0 resection is undertaken, a full histological assessment of the excised tumour will allow the SM level to be determined and therefore predict the risk of lymph node involvement. This would enable clinicians to offer immediate rescue operation in the form of anterior resection to those patients with SM2 and SM3. In some situations where this is not possible (patient choice or medically unfit), radiotherapy should be considered as an alternative.

Local excision may be offered to carefully selected patients with two other treatment intentions: compromise and palliation.

In the compromise group, patients are offered local excision if they have resectable tumours causing symptoms but are medically unfit to undergo radical surgery. In the palliation group, patients have irresectable symptomatic tumours. In both of these groups the main aim is symptom control. Oncological control is not a priority but is welcome if achieved.

T1 and T2 tumours should be considered for the TREC (Transanal Endoscopic Microsurgery and Radiotherapy in Early Rectal Cancer) trial.

6.5 Record keeping

The following checklist will be used whenever possible to construct an operation note for patients undergoing surgery for colorectal cancer:

- Names of operators, assistants and anaesthetists
- American Society of Anesthesiologists status of the patient
- Findings at operation, specifically:
  - Site of primary tumour together with size, fixity and involvement of other structures. With a rectal tumour, its relationship to the pelvic brim and peritoneal reflection should be clearly stated
  - Presence or absence of liver metastases, peritoneal metastases and lymphadenopathy
  - State of the remaining colon with specific mention of the presence or absence of synchronous tumours
- Operative procedure, specifically:
  - Site of the vascular ligation
  - Extent of resection. With rectal tumours, specific mention of the degree of mesorectal excision should be made
  - Level and method of anastomosis
  - Use and content of any peritoneal lavage
  - Use and content of any rectal washout
  - Statement as to whether the surgeon regards the resection as curative (i.e. no residual macroscopic tumour)
  - Sites and reasons for stomas.
6.6 Enhanced recovery

Programmes for enhanced recovery after surgery should be adopted by all surgical and anaesthetic teams treating patients with colorectal cancer in the LCA to improve care and patient experience and reduce hospital length of stay. The patient’s personal circumstances must be taken into account when planning earlier discharge and it must be ensured that appropriate support arrangements are fully in place prior to their departure from hospital.

6.7 Surgical treatment for emergency presentations

Colorectal cancer presents relatively frequently as an emergency (up to 27%). These patients usually have a worse prognosis. They may present during times when the specialist colorectal team is not on duty. Therefore, it is expected that the on-call surgical team will stabilise the patient’s condition by conducting initial resuscitation and assessment, and initiate primary diagnostic processes to an agreed protocol depending on the nature of presentation.

Handover from the on-call team to the colorectal specialist team or a core member of the MDT should occur by the next working day. However, immediate surgery may be necessary in events such as perforations or torrential bleeding, especially if the patient’s condition is such that delaying surgery would increase the risk of morbidity and mortality. Such immediate or out-of-hours operations should not exceed 5% of cases. In these situations, patients will be referred to the colorectal MDT after the operation, and patient care is transferred to a core surgical member of the MDT.

Sufficient flexibility in the job plans should be made available to the specialist surgical team to carry out urgent and emergency operations that have been transferred into their care.

For detailed management of emergencies, see Appendix 3. A summary of important and salient points is outlined below:

- In the absence of perforation or life-threatening bleeding, operations for large bowel obstruction can be regarded as urgent rather than an emergency, except in situations where the ileocaecal valve is competent and the caecum is in danger of perforation.
- Patients presenting with large bowel obstruction and acute peritonitis should have a CT scan before operating to confirm the diagnosis and, in the case of obstruction, exclude pseudo-obstruction.
- Patients with obstruction, bleeding and perforation should be carefully prepared for surgery, with adequate fluid resuscitation.
- Antibiotic and DVT prophylaxis should be administered.
- Intensive care or high-dependency facilities should be used where possible for pre-operative optimisation and post-operative care.
- Every effort should be made to operate during daytime hours with experienced surgeons and anaesthetists.
- For right-sided obstructing lesions, primary resection and ileocolic anastomosis is usually feasible.
- For left-sided lesions, the use of a simple de-functioning colostomy without definitive treatment of the obstructing tumour should be carried out in the patient’s interests only, not as a result of lack of experienced surgical staff. Whenever possible, immediate resection of the obstructing cancer should be carried out, either as a Hartmann’s procedure with end colostomy or, when conditions are
favourable, as a primary resection with anastomosis (a segmental resection with on-table colonic lavage or as a subtotal colectomy with ileorectal anastomosis).

- **Stents** *(Appendix 4)* should be considered to decompress obstructing left-sided tumours (mid and lower rectal tumours excluded) prior to definitive surgery, if appropriate. The decision to use stents should be made by at least two members of the colorectal MDT, an endoscopist, surgeon and a radiologist. There is no need to delay this decision until the full MDT meets. It is also accepted that stenting will only be undertaken by clinicians who are deemed competent to perform the procedure. The LCA aims to achieve the stated guidance of 15 stents per million. Where expertise exists, laser palliation and recanalisation of obstructing tumours could be considered as an alternative to stents in unfit or unsuitable patients.

- Patients with faecal peritonitis should have the source of the perforation and the tumour (if perforation occurred at a different site) removed. Anastomosis should be avoided in this group of patients. In fit young patients with purulent peritonitis, an anastomosis could be considered if deemed appropriate but this should be covered by a de-functioning proximal stoma.

- The LCA aims to treat patients with obstruction (either by surgery or stent insertion) within 48 hours of presentation and those with perforation within 6 hours, as long as patients are deemed stable enough to allow safe treatment.

- Aspirational best practice is that all emergency surgery should be performed by, or under the direct supervision of, a designated consultant colorectal surgeon. However, given the resource implication of this, emergency surgery for perforation should be undertaken according to local and National Confidential Enquiry into Patient Outcome and Death (NCEPOD) guidelines and referred to a colorectal surgeon as soon as possible.

- A partial enhanced recovery programme should be implemented as appropriate.

- The overall mortality for emergency/urgent surgery should be less than 25%.

### 6.8 Surgical outcomes and metrics

The key outcome expected of local MDTs is to deliver high-quality clinical services for patients with colorectal cancer to ensure excellent patient experience and cancer survival rates that are equal to or better than the best rates in Europe. To facilitate this, the LCA and the Colorectal Pathway Group have, in addition to developing these guidelines, recommended that local MDTs should record and collect high-quality data to assess the quality of care provided to patients and also determine if improvement to the service is required.

The MDTs will ensure that standards of performance are routinely monitored and that remedial action is promptly taken where these standards are not attained. As part of this, the LCA will provide the pathway group with agreed performance monitoring data against the metrics specified in the colorectal cancer commissioning pathway and other LCA agreed metrics for a review on a periodic basis.

#### 6.8.1 Operative mortality

The ACPGBI guidelines recommend that services achieve an operative mortality of <20% for emergency surgery and <7% for elective surgery for colorectal cancer. NBOCAP (2013) reported that overall post-operative mortality has fallen to 4.5% after major colorectal cancer surgery. The report noted that emergency major surgery was associated with a risk of death of 8.9% at 30 days and 13.7% at 90 days. The LCA aims to achieve the NBOCAP figures above.
6.8.2  **Wound infection**

The LCA aims to achieve wound infection rates after elective surgery for colorectal cancer of around 10%, as per national guidance.

6.8.3  **Anastomotic dehiscence**

The LCA aims to achieve an overall leak rate below 8% or anterior resections and below 4% for other types of resection (as per national guidance).

However, it is recognised that surgeons performing appreciable numbers of ultra-low pelvic anastomoses may have a higher leak rate for this procedure, and the judicious use of a de-functioning stoma is recommended.

6.8.4  **Recurrence rates**

The LCA aims to achieve local recurrence rates after curative resection for rectal cancers of less than 10% within two years (as per national guidance).

6.8.5  **Survival rates**

The LCA aims to cooperate with Thames Cancer Registry and London Cancer to facilitate auditing of survival rates of patients with colorectal cancer.

6.8.6  **Staging data**

The percentage of newly diagnosed colorectal cancer with a recorded clinical stage should be >80% (as per national guidance).

6.8.7  **Clinical lines of enquiry**

- The proportion of newly registered colorectal cancers being submitted to NBOCAP for case ascertainment should be >80% and for data completeness >80% (as per national guidance)
- The proportion of newly diagnosed colorectal cancer patients being radiologically staged with CT (>80%) for colonic cancer, and with MRI (>80%) for rectal cancers
- 30 days post-operative mortality
- Surgical returns to theatres within 30 days
- Re-admission rates within 30 days
- Proportion of newly diagnosed cases not undergoing surgical excision
- Proportion of surgical patients receiving enhanced recovery
- Average length of stay following surgery.

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1 ACPGBI (2007) *Guidelines for the Management of Colorectal Cancer, 3rd edition*

2 Ibid.
7 Pathology

See Appendix 9 for more detailed guidelines.

- All resected polyps and cancers should be submitted for histopathological examination.
- Pathology laboratories should store stained histology slides for a minimum of 10 years and tissue blocks from specimens indefinitely in order to facilitate future case review, clinical audit and research.
- It is the responsibility of the reporting pathologist along with all other members of the MDT to ensure that new colorectal cancer diagnoses are reported to the MDT coordinator.

Pathology reports should contain information on all the data items contained in the Royal College of Pathologists minimum dataset for colorectal cancer histopathology reports.¹

7.1 Gross description

- Site of tumour
- Maximum tumour diameter
- Distance of tumour to nearest margin
- Presence of tumour perforation.

For rectal tumours

- Relationship to the peritoneal reflection
- Distance from dentate line.

7.2 Histology

- Type
- Differentiation by predominant area
- Degree of tumour regression (if appropriate)
- Local invasion
- Margins.

Tumour involvement of the following:

- Doughnuts
- Margin (cut end)
- Circumferential margin (rectal cancers only).

Metastatic spread of the following:

- Number of lymph nodes examined
- Number of positive lymph nodes
- Apical node positive
- Extramural vascular invasion
- Perineural invasion.
Background abnormalities

The presence or absence of the following in the background bowel is recorded:

- Adenoma(s)
- Synchronous carcinoma(s) (each of which will require a separate proforma)
- Ulcerative colitis
- Crohn’s disease
- Familial adenomatous polyposis.

7.3 Revised Bethesda guidelines for Lynch syndrome/HNPCC

For Lynch syndrome/hereditary non-polyposis colorectal cancer (HNPCC):

- Specimens should be reported as per the Bethesda guidelines. That is, in patients under 60 years old, is there signet-ring type, mucinous, lymphocytic infiltrate, Crohn’s-like, medullary-type?
- Immunohistochemistry (IHC) should be arranged for Lynch syndrome in patients meeting the guidelines as outlined in Chapter 12. The initial biopsy may be used to perform IHC.

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8 Non-surgical Management of Rectal Cancer – Radiotherapy

The decision to treat patients with radiotherapy is agreed at the colorectal multidisciplinary team (MDT), based on the accepted clinical indications and taking into account the patient’s own circumstances. Patients will be informed by the clinician in charge of the patient where the diagnosis was made and an appropriate referral made to the clinical oncology team.

Patient care will remain with the referring consultant until the patient is seen by the clinical oncology team. The referring team will ensure that all the relevant documentation including histology and staging investigations is available for review by the clinical oncology team at the time of the patient appointment. The team may decide to carry out further investigations such as blood tests or additional imaging depending on the requirements of the case.

8.1 Neo-adjuvant chemotherapy

Consider neo-adjuvant chemotherapy (NACT) prior to radiotherapy (as per EXPERT trial1) in the following situations:

- Locally advanced disease, e.g. T4, bulky T3 or where there are multiple pelvic nodes and high risk of systemic relapse
- Synchronous liver metastases, where liver resection is being contemplated in addition to resection of the primary rectal tumour. In these circumstances, the usual treatment order would be:
  - NACT (12 weeks) – clinician's appropriate choice of regimen. If bevacizumab is used, stop within 6 weeks of surgery
  - Restaging
  - Short or long-course pelvic radiotherapy – according to clinician choice. However, there is a benefit of short-course radiotherapy (SCRT) in minimising time to liver resection in this patient group
  - Liver resection within 6 weeks of completing radiotherapy
  - Restaging
  - Resection of primary rectal tumour
  - Completion of chemotherapy – 12 weeks (as per pre-op)
- Patients likely to require an abdominoperineal (AP) excision where there is a risk of delayed perineal wound healing following surgery which could delay chemotherapy in the adjuvant setting.

Please note there is currently no Level 1 evidence to support this approach. Multiple phase II studies are available and should be discussed in a MDT meeting and with the patient.
8.2 Pre-operative treatment of rectal cancer

8.2.1 Pelvic radiotherapy

The addition of pre-operative (chemo) radiotherapy (CRT) to surgery significantly reduces the incidence of local recurrence by 50–60% in most studies. The Swedish rectal cancer study also showed that pre-operative radiotherapy can improve survival, although this has not been confirmed in other trials.

Long-course pre-operative CRT can also be used to down-stage unresectable tumours and render them potentially operable, resulting in improved local control rates.

The aim of CRT is to reduce the incidence of recurrent rectal cancer within the pelvis and to facilitate a curative resection with clear circumferential resection margin (CRM).

The following are indications for neo-adjuvant CRT, irrespective of T or N stage:

- Magnetic resonance imaging (MRI) suggests disease (primary tumour or lymph node) threatening or involving the CRM
- MRI suggests presence of extramural vascular invasion
- Anterior quadrant disease (close CRM)
- MRI suggests internal iliac lymph node involvement (in addition to mesorectal node involvement).

Table 8.1: Suggested options for initial therapy approach for rectal cancer

<table>
<thead>
<tr>
<th>T stage</th>
<th>N stage</th>
<th>Lower rectum 4–8cm</th>
<th>Mid rectum 8–12cm</th>
<th>Upper rectum 13–15cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 N0 M0</td>
<td>Surgery</td>
<td>Surgery/TAE/TEMS</td>
<td>Surgery</td>
<td>Surgery/TAE/TEMS</td>
</tr>
<tr>
<td>T2 N0 M0</td>
<td>Surgery</td>
<td>Surgery</td>
<td>Surgery</td>
<td>Surgery/SCRT/CRT</td>
</tr>
<tr>
<td>T3a N0 M0</td>
<td>Surgery</td>
<td>Surgery/SCRT</td>
<td>Surgery/SCRT</td>
<td>Surgery/SCRT</td>
</tr>
<tr>
<td>T3b N0 M0</td>
<td>Surgery/SCRT/CRT</td>
<td>SCRT/CRT</td>
<td>SCRT/CRT</td>
<td>SCRT/CRT</td>
</tr>
<tr>
<td>T3c–T4 N0 M0</td>
<td>CRT</td>
<td>CRT</td>
<td>CRT</td>
<td>CRT</td>
</tr>
<tr>
<td>T1–T3b N1 M0</td>
<td>Surgery/SCRT/CRT</td>
<td>Surgery/SCRT/CRT</td>
<td>Surgery/SCRT/CRT</td>
<td>Surgery/SCRT/CRT</td>
</tr>
<tr>
<td>T3c–T4 N1 M0</td>
<td>(NACT) /CRT</td>
<td>(NACT) /CRT</td>
<td>(NACT) /CRT</td>
<td>(NACT) /CRT</td>
</tr>
<tr>
<td>T(any) N2 M0</td>
<td>(NACT) /CRT</td>
<td>(NACT) /CRT</td>
<td>Surgery/(NACT)</td>
<td>Surgery/(NACT)</td>
</tr>
</tbody>
</table>

Notes:

1. Patients with lower rectal cancer should be discussed in MDT with surgical colleagues. With the extralevator abdominoperineal excision surgical approach, CRT is not required for all cases and should be reserved for those where there is concern about obtaining a clear surgical margin.

2. Consider NACT as an option in these groups.

3. SCRT is an accepted treatment to reduce local recurrence for rectal cancer and can be considered for selected patients including T3 lesions with clear CRM and EMVI/poorly differentiated histology; medically inoperable early rectal tumours; as treatment for nodal risk following TEMS/TAE for T2 lesion in patients who decline or are unsuitable for APER.

Terms: N0: no regional lymph node metastasis; M0: no distant metastasis; N1: metastasis in peri-rectal lymph node(s); N2: metastasis in unilateral internal iliac and/or inguinal lymph node(s); TAE: transanal excision; TEMS: transanal endoscopic microsurgery.
8.2.2 Rectal cancer radiotherapy planning

Position and immobilisation

The patient is CT scanned (computed tomography) prone on a belly board, or supine. The patient must have a comfortably full bladder to push small bowel superiorly, and an empty rectum. An anal marker should be positioned pre-scan.

CT planning scan

CT scan performed with 3–5mm slices from L3 to 3cm below anus or lowest extent of tumour. Intravenous (IV) contrast venous phase is preferred for nodal delineation as per local protocol.

Target volume delineation

As per the national ARISTOTLE trial protocol, summarised below:

- Gross tumour volume (GTV): primary tumour + involved nodes
- Clinical target volume (CTV)–A: GTV + 1cm expansion
- CTV–B: elective nodes – mesorectal, presacral, obturator, internal iliac chain
- CTV–F: CTV–A + CTV–B, trimmed off pelvic bone and femoral heads
- Planning target volume (PTV): CTV–F + 1cm expansion.

Selection of optimal plan and normal tissue dose constraints

- PTV max <107%
- PTV coverage with 95% isodose
- Avoid hot spots, especially those over small bowel
- Patients with a large volume of air in the rectum or with a small bladder may need to be rescanned at the clinician’s discretion.

Normal tissue constraints

- Try to keep femoral head dose <70%
- Small bowel dose <45Gy to any point
- Care with sacral dose. There is a recognised incidence of late sacral fractures. If CT planning, try to spare sacrum where possible
- Avoid covering anal sphincter mechanism except in low rectal tumours where it is unavoidable. There is a higher incidence of late sphincter incompetence when irradiated
- Try to keep prostate and bladder dose <PTV max.

In order to achieve these constraints, sometimes a four-field technique is preferable to a three-field technique. For intensity-modulated radiation therapy (IMRT) technique, see Chapter 5 on anal cancer.

Dose prescription

For SCRT, surgery is normally to be performed within 7 days of completion of radiotherapy to avoid enhanced surgical morbidity and patient toxicity. 25Gy in 5# over 5–7 days.
**Radiotherapy dose options**

- **45Gy in 25# over 33 days**
- **50.4Gy in 28# over 38 days (2-phase – Phase II off small bowel)**
- **54Gy in 30# over 40 days (2-phase – Phase II off small bowel)**

with low dose folinic acid and 5FU days 1–5 and 29–33 or oral capecitabine 825mg/m^2 per day continuously throughout radiotherapy

- **45Gy in 20# over 26 days (no chemotherapy).**

**Patient management during and after radical radiotherapy**

- Patients should be reviewed by a doctor, clinic radiographer or nurse weekly during treatment and more often if clinically indicated.
- Patients should be asked specifically about capecitabine-related toxicity and checked for hand and foot syndrome, rectal bleeding, skin reactions, diarrhoea, radiation cystitis, proctitis, and tenesmus, and managed accordingly. Be aware of potential cardiotoxicity with capecitabine, which can manifest in a multitude of different symptoms, including dyspeptic type symptoms.
- Patients’ holistic needs should be assessed using holistic needs assessment (HNA) and managed as indicated. Referrals to other services such as psychology and occupational therapy should be made as required.
- Post-treatment MRI scans and follow-up appointments should also be arranged (in the last on-treatment review visit).
- A full blood count (FBC), urea and electrolytes (U&E) and liver function test (LFT) should routinely be performed in weeks 1, 3 and 5 to assess renal/liver function and cumulative chemotherapy and radiation-induced pelvic bone marrow effects. These bloods should be performed more often if clinically necessary. Suspension of chemotherapy or radiotherapy for low blood counts should be as per departmental guidelines.
- A treatment summary outlining treatment given, possible side effects and ongoing follow-up should be completed following discussion with the patient and sent to their GP.

### 8.3 Post-operative radiotherapy

Post-operative chemo-radiation in rectal cancer should be considered for the following patient groups. This is often in patients presenting with an acute surgical emergency (obstruction/perforation) who undergo immediate surgery. **Wherever possible, radiotherapy treatment should ideally be administered pre-operatively.**

- A positive circumferential margin (1mm or less on the CRM).
- Patients with extra-mural vascular invasion (EMVI+) or multiple lymph nodes involved. It is **not** necessarily recommended that all node EMVI+ cases of rectal cancer should receive post-operative chemo-radiation. Instead, a selective approach should be employed, utilising radiotherapy for a high risk of local recurrence as determined by local MDT members and the pathologist. Lymph node involvement (no prior chemo-radiation) is considered an indication for post-operative chemo-radiation in the US but in the UK is considered as a relative indication given that it improves disease-free survival (DFS), not overall survival, and is associated with a risk of significant morbidity due to small bowel irradiation.
• Incompletely resected colon cancer. There is no evidence base for the routine use of pre or post-operative radiotherapy in colon cancer. However, it seems rational to consider radiation/chemo-radiation for incompletely resected cancers, or for fixed cancers where the surgeon has had to rely on sharp dissection (particularly sigmoid and recto-sigmoid tumours looping down into the pelvis), and selected cases of caecal cancer with positive resection margins.

Occasionally the anterior abdominal wall may need to be irradiated if there is evidence of a T4 tumour invading the musculature or peritoneum and a concern over microscopic clearance. In this situation, the surgeon is often aware at the time of the surgery, and should be encouraged to site ligia clips in the anterior abdominal wall over the area of concern for radiotherapy field definition.

The post-op PTV will be defined by the surgeon and a view given on the risk of unresected/residual disease and fixation. (In general, the perineum only needs to be included in the volume if the tumour lies within 4cm of the anal margin.)

Radiotherapy dose options

• 45Gy in 25# over 33 days
• 50.4Gy in 28# over 38 days

All with concomitant chemotherapy, low dose folinic acid and 5FU days 1–5 and 29–33. Or oral capecitabine 825mg/m² per day continuously throughout the radiotherapy.
• 45Gy in 20# over 26 days (no chemo)
• Abdominal wall – at the clinician’s discretion, electron beam radiotherapy (energy dependent on treatment depth required) or orthovoltage (150–300kV). 10Gy single fraction, 30Gy in 5–6#, 40Gy in 15#, 45Gy in 25# are all acceptable.

8.4 Radiotherapy to locally recurrent rectal cancer

CRT can be administered as part of neo-adjuvant therapy if the pelvis has not been previously irradiated.

Retreatment radiotherapy is possible for palliation or prior to attempted surgery. No evidence-based guidelines exist, but there are some excellent review papers. Usually this would be attempted only for recurrences >6 months from initial therapy. The RT dose should be determined after discussion with the radiotherapy physicist regarding the previous dose to the pelvis, length of time since previous radiotherapy, extent of field required (keep as small as possible) and estimated recovery of normal tissue tolerance.

For small isolated pelvic nodal recurrences that are inoperable, stereotactic radiotherapy is a treatment option, using a gantry-based system or CyberKnife. This is a specialist area and consideration of referral to a clinical oncologist with specialist expertise is recommended.

8.5 Radiotherapy for early rectal cancer

Radiotherapy may be offered to patients with early rectal cancer treated by local surgery (EMR), Parks transanal rectal excision (TAR), transanal endoscopic microsurgery (TEMS)) in the following circumstances:
• To sterilise the positive resection margin if histology confirms that an R1/R2 resection has been performed and the patient is either not fit for or refuses radical completion surgery.
• To sterilise the surrounding field and draining lymph nodes, and reduce the risk of local recurrence if R0 resection has been achieved, but the risk of lymph node positivity is assessed by the MDT as high,
as in T1 SM2, T1 SM3 or T2 lesions, and the patient is either not fit or refuses radical completion surgery.

Technique, dose and fractionation are as for pre-operative rectal radiotherapy above.

8.6 Palliation for symptom control

Indications for palliative radiotherapy include pelvic pain, rectal bleeding or discharge in frail patients not suitable for a radical approach, or recurrence after previous radiotherapy treatment not suitable for a radical approach.

Radiotherapy fractionation options

- 8–10Gy single to MPD
- 20Gy in 5# over 5–7 days to MPD
- 25Gy in 5# over 5–7 days to MPD or 3-field plan
- 30Gy in 10# over 12–14 days to MPD
- 30Gy in 6# over 3 weeks (twice a week) 3-field plan, localised volume to primary for medically inoperable frail patients
- 45Gy in 20# over 26 days as a 3-field plan.

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9 Non-surgical Management of Colorectal Cancer – Chemotherapy

See also Appendix 3 on management of colorectal cancer emergencies.

9.1 Colorectal cancer – early stage/localised disease

9.1.1 Stage I/Dukes A colorectal cancer

- Adjuvant chemotherapy is not recommended for Stage I/Dukes A disease.

9.1.2 Stage II/Dukes B colorectal cancer

- The routine use of adjuvant chemotherapy for patients with Stage II/Dukes B colorectal cancer is not recommended.
- Enrolment of patients in clinical trials is encouraged where possible.
- A discussion with the patient explaining their individual risk factors for tumour recurrence, treatment toxicity, estimated life expectancy based on age and co-morbidities, and the estimated benefit of adjuvant chemotherapy should take place. This should be recorded in the treatment summary.
- **High-risk criteria** comprise any one of the following features:
  - pT4 tumours with serosal breach
  - Emergency presentation – obstruction/perforation, extramural vascular invasion or lymphatic (extramural venous invasion (EMVI), extramural lymphatic invasion (EMLI))
  - Poorly differentiated tumours (G3 or G4), low levels of microsatellite instability (MSI-L), see below
  - Inadequately sampled nodes (<12)
  - Perineural invasion is less clear as a high-risk criteria but may be considered.
- **MSI testing** – patients with high levels of microsatellite instability (instability at 30% or more of loci tested – MSI-H) have an improved prognosis relative to those with MSI-L. Adjuvant chemotherapy in this good prognosis population (MSI-H) has failed to demonstrate a survival benefit. MSI-H status is associated with tumours at the splenic flexure, mucinous differentiation, high-grade/poorly differentiated tumours, intra/peri-tumoural lymphocytic infiltration.
- High-risk Stage II/Dukes B patients should be considered for adjuvant chemotherapy. There is no evidence for the routine use of doublet (addition of oxaliplatin) chemotherapy in this group. The QUASAR trial\(^1\) showed a small benefit in all Dukes B patients of monotherapy.
- Low-risk Stage II/Dukes B patients should be considered for clinical trials if available. Adjuvant chemotherapy (5-Fluorouracil (5FU)/capecitabine monotherapy) or surveillance are both acceptable treatment approaches.
- There is no evidence to suggest additional benefit from doublet chemotherapy for low-risk disease. It may be considered for those with high-risk disease with consideration given to treatment toxicity.
- If the patient and clinician consider adjuvant chemotherapy appropriate, 6 months of 5FU or capecitabine-based treatment is recommended.
- Patients should commence adjuvant chemotherapy following surgery within 12 weeks.
- There is no evidence to support the use of irinotecan or the addition of biological therapies as part of adjuvant treatment of Stage II disease.
9.1.3 Stage III/Dukes C colorectal cancer

- Adjuvant chemotherapy is recommended for patients with Stage III/Dukes C colorectal cancer who are fit and have no significant co-morbidities to impact on their 3-year survival. Clinical trial evidence suggests an absolute overall survival benefit. Enrolment of patients with Stage III/Dukes C colorectal cancer in clinical trials is encouraged where possible.

- Current recommendations suggest the optimum duration of adjuvant treatment is 6 months.

- Patients should commence adjuvant chemotherapy following surgery within 12 weeks.

- Doublet chemotherapy with the addition of oxaliplatin adds additional benefit above 5FU alone. However, this is at a cost of additional early and late toxicity. Many patients may not be able to complete the 6 months of oxaliplatin due to the progressive neurotoxicity and the risk of permanent neurotoxicity.

- Clinical trial evidence supports the use of the oral fluoropyrimidine capecitabine as being equivalent to intravenous 5FU but with a different toxicity profile.

- Single agent fluoropyrimidine (intravenous (IV) 5FU or oral capecitabine) is an acceptable treatment option for patients considered unfit for doublet/oxaliplatin-containing chemotherapy due to co-morbidities and/or poor performance status.

- Capecitabine dose should be carefully considered in patients with impaired renal function. It is associated with serious risks of cardiac and diarrheal toxicities.

- In patients over 70 years, doublet chemotherapy including oxaliplatin should be considered with caution. Clinical trial subset analysis suggests the additional benefit of doublet over monotherapy to be modest in this age group at a cost of increased toxicity.

- Oxaliplatin is associated with a risk of long-term neurotoxicity. Patient selection, patient counselling, close monitoring and dose modification is recommended.

- There is no evidence to support the use of irinotecan-based regimens or biological therapies as part of adjuvant treatment of Stage III disease.

Selection of the appropriate regimen should account for the treatment toxicity profile, patients’ co-morbidities and preferences following discussion with an oncologist.

9.2 Adjuvant chemotherapy regimens

Table 9.1: Adjuvant chemotherapy regimens

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single agent capcitabine</td>
<td>1,250mg/m² BD PO x 14/7 21-day cycle x 8 cycles</td>
</tr>
<tr>
<td></td>
<td>Consider dose reductions in impaired renal function and age &gt;70</td>
</tr>
<tr>
<td>mFOLFOX6</td>
<td>Oxaliplatin 85mg/m² IV 14-day cycle</td>
</tr>
<tr>
<td></td>
<td>Calcium folinate 350mg IV 14-day cycle</td>
</tr>
<tr>
<td></td>
<td>5FU 400mg/m² bolus IV 14-day cycle</td>
</tr>
<tr>
<td></td>
<td>5FU 2,400mg/m² IVI over 46 hours 14-day cycle</td>
</tr>
<tr>
<td>Cape/Ox</td>
<td>Oxaliplatin 130mg/m² IV 21-day cycle</td>
</tr>
<tr>
<td></td>
<td>Capecitabine 1,000mg/m² BD PO x 14/7 21-day cycle</td>
</tr>
<tr>
<td></td>
<td>Consider capecitabine dose reductions in impaired renal function and age &gt;70</td>
</tr>
</tbody>
</table>
9.3 Metastatic colorectal cancer

- Enrolment of patients in clinical trials is encouraged where possible, including non-chemotherapeutic approaches such as the UK FOXFIRE study of radioembolisation.
- In all cases of metastatic colorectal cancer, molecular analysis to determine the presence of mutations in KRAS, NRAS and where possible BRaf should be performed as soon as the diagnosis is made and treatment is being considered.
- There is growing interest in the role of biopsy of metachronous metastatic disease as the molecular profile of metastases may differ from that of the primary tumour.
- If life expectancy is a year or less at diagnosis, consideration of end-of-life care issues, such as advanced care planning, is indicated. Referrals to specialist palliative care should be made if necessary.

9.3.1 Stage IV – operable metastatic disease

- All patients with liver metastases should be discussed at the liver MDT at the outset and a treatment sequence and plan agreed.
- For patients undergoing resection of hepatic or extrahepatic metastatic disease, there is evidence to support a 6-month course of peri-operative fluoropyrimidine-based systemic chemotherapy. However, trial evidence supporting the use of adjuvant chemotherapy in this setting is lacking. Likewise, no trials have been performed directly comparing peri-operative chemotherapy with adjuvant treatment. The optimal approach should be decided by an MDT on an individual case basis.
- In the case of synchronous metastatic disease with an in-situ non-obstructing primary, there is no evidence to dictate the optimal sequencing of resection of the primary, metastectomy and delivery of chemotherapy. This should be decided by MDT on an individual case basis.
- Neo-adjuvant chemotherapy increases the risk of chemotherapy-induced hepatotoxicity (which can impact on surgical morbidity). This must be considered when determining the sequencing of hepatic surgery and peri-operative chemotherapy. The optimal maximum duration currently recommended is 3 months. This may be longer if the tumours are being down-staged but should be discussed with the liver MDT. It is unlikely that beyond 5 months of neo-adjuvant chemotherapy there will be incremental benefit at the expense of further hepatotoxicity.
- The drug combinations FOLFOX/FOLFIRI are acceptable neo-adjuvant regimens based on patient preference, co-morbidities and treatment toxicity profile.
- There is evidence that FOLFIRI is not beneficial as an adjuvant therapy post-liver resection.
- There is no conclusive evidence to support the addition of biological therapy to chemotherapy in the peri-operative/adjuvant post metastectomy setting. Triplets may result in higher response rates but this may not be correlated with improved survival.

9.3.2 Stage IV – inoperable metastatic disease

Patients with inoperable metastatic disease can be subdivided into two groups:

- Borderline resectable – this is defined on an individual patient by patient basis by the relevant MDT
- Palliative.
Broadly, the options for chemotherapy are the same in these two groups and this will be one of the factors influencing choice of regimen. In the former, the goal is a high response rate to maximise the prospect of sufficient down-sizing permitting resection. Consequently, such patients will routinely be offered doublet (or triplet) chemotherapy. There is uncertainty about the role of cetuximab in this population, pursuant to the results of the New EPOC study\(^3\) (a prospective randomised open label trial of oxaliplatin/irinotecan plus fluorouracil versus oxaliplatin/irinotecan plus fluorouracil and cetuximab pre and post operatively in patients with resectable colorectal liver metastases requiring chemotherapy – final analysis with mutation profiles pending). Certainly, cetuximab should only be used in combination with FOLFIRI in this context.

There is no phase III data on the benefits of bevacizumab in addition to chemotherapy for patients with borderline resectable disease. However, some Phase II studies (BOXER\(^4\), OLIVIA\(^5\)) – A multicentre phase II trial of capecitabine and oxaliplatin plus bevacizumab as neoadjuvant treatment for patients with liver-only metastases from colorectal cancer unsuitable for upfront resection, OLIVIA - A Study of Avastin (Bevacizu have indicated high response rates with encouraging long-term outcomes for patients managed peri-operatively with bevacizumab-containing chemotherapy regimens. Conversely, the GONO (Gruppo Oncologico Nord Ovest) trials of triplets did not demonstrate an increase in rates of R0 resection. The optimal duration of chemotherapy prior to resection is not known. It is recommended that re-evaluation imaging is performed at least every 3 months. Those that have become resectable could either proceed to surgery or complete chemotherapy (usually for a total of 6 months) before resection.

### 9.3.3 First-line treatment

In the palliative group, the goals for therapy are to maximise longevity and quality of life. Hence, there is considerable debate about the sequence of regimens and the duration of treatment. Evidence supports the use of 5FU, oxaliplatin, irinotecan and bevacizumab for patients with metastatic colorectal cancer. In NRAS/KRAS wild type there is increasing evidence for cetuximab and panitumumab triplets. Treatment is based on a backbone of 5FU, which may be used as a single agent. Doublet chemotherapy with the addition of either irinotecan or oxaliplatin provides additional benefit with additional toxicity. Triplet chemotherapy has demonstrated increased response rates compared with doublet regimens with increased toxicity.

- Treatment options include:
  - mFOLFOX6
  - FOLFIRI
  - Cape/Ox
  - Capecitabine single agent
  - FOLFOX/FOLFIRI/cape/ox + bevacizumab (19–21) where NCDF list criteria are met
  - FOLFOXIRI.

- RAS mutation – anti-EGFR targeted therapy should not be incorporated into the algorithm for treatment for patients with KRAS mutations. Similarly, data has demonstrated that there is no benefit to anti-EGFR therapy in patients with NRAS mutations. There is no consistent data on the role of BRaf mutation as a predictive marker for efficacy of anti-EGFR therapy, but it is an adverse prognostic factor irrespective of choice of chemotherapy.
• RAS wild type – anti-EGFR targeted therapy should be incorporated into the treatment algorithm of patients with wild-type RAS.
  – FOLFIRI/Cetuximab (where NCDF criteria are met)
  – FOLFOX + cetuximab (where NCDF criteria are met)
  – FOLFOX + panitumumab (where NCDF criteria are met).
• Poor performance status/(WHO PS 2) – for patients considered unfit for doublet chemotherapy because of co-morbidities, evidence supports the efficacy and safety of the following regimens:
  – Single-agent capecitabine
  – Reduced-dose oxaliplatin-containing doublet (SFU or capecitabine)
  – Capecitabine or infusional SFU plus bevacizumab (where NCDF criteria are met).
• Fluoropyrimidine +/- bevacizumab can be continued following discontinuation of oxaliplatin/irinotecan until disease progression.
• There is preliminary evidence that for patients with platelet counts ≥ 400 x 109/l that outcomes are inferior with intermittent chemotherapy compared with continuous chemotherapy.
• The FIRE-3 study6,7 included 592 patients with KRAS wild-type colorectal cancer. At the primary endpoint of the study, response rate demonstrated no significant difference. However, the survival curves separated at about 24 months to demonstrate a survival advantage (28.7 v 25 months; p=0.017) for the use of cetuximab in combination with FOLFIRI compared with FOLFIRI plus bevacizumab. A further molecular analysis of those with tissue available (tumour samples available in 488 patients, extended RAS mutations analysed in 407 patients) confirmed this advantage (33.1 v 25.6 months; p=0.017) in patients with no KRAS or NRAS mutation. However, even in this sub-population, no response or PFS advantage was observed and the curves separate at approximately 2 years from study entry. Consequently, it is clearly an option to commence treatment with FOLFIRI-cetuximab but there are many questions as to this observation. The Initial results of the CALGB 80405 study, addressing the question of whether bevacizumab or cetuximab have different benefits in first line therapy, were presented at the 2014 Annual meeting of the American Society of Clinical Oncology. Further reports, particularly the analysis with all RAS mutations, are awaited.
• In patients who achieve a response to treatment, the potential for surgical resection of hepatic and extrahepatic disease should be considered. MDT discussion is recommended.
• Cardiac toxicity – 5FU may cause cardiotoxicity as fluoropyrimidines are endothelial toxins. Longer dosing schedules as with capecitabine may put patients at higher risk of MI and VF. The risk estimates are in 1–5% of the population. Patients who experience angina/prolonged chest pain following 5FU or capecitabine chemotherapy should not continue. This situation probably provides the only rationale for the use of raltitrexed, which is approved by the National Institute for Health and Care Excellence in this indication.
• Bevacizumab impairs wound healing and at least a 6-week treatment break is recommended prior to elective surgery.
• Oxaliplatin is associated with a risk of long-term neurotoxicity. Patient selection, patient counselling, close monitoring and dose modification is recommended. In the advanced setting, discontinuation of oxaliplatin after 3 months with continuation of the other drugs in the regimen to complete 6 months treatment is an acceptable option.
9.3.4 Second-line treatment

The choice of second-line therapy is significantly influenced by first-line therapy. There is good evidence for the benefit of anti-angiogenic therapy with bevacizumab in combination with FOLFOX following prior irinotecan-containing treatment or with aflibercept with FOLFIRI following prior oxaliplatin-containing therapy (where NCDF criteria are met).

- Treatment options include:
  - FOLFOX or cape/ox following progression on irinotecan-based regimen
  - FOLFIRI following progression on oxaliplatin-based regimen
  - FOLFOX + bevacizumab (where NCDF criteria are met). This is currently funded via the National Cancer Drugs Fund for those not treated with bevacizumab in the first-line setting
  - FOLFIRI + aflibercept (where NCDF criteria are met). This is currently funded via the National Cancer Drugs Fund for patients who have received first-line oxaliplatin-containing therapy with or without bevacizumab.

9.3.5 Third-line treatment

- Patients should be considered for clinical trials if fit.
- Best supportive care only is an acceptable option.
- Treatment options include:
  - Regorafenib (currently not CDF approved)
  - Mitomycin C/capecitabine.
- For RAS wild-type patients only, not previously treated with anti-EGFR therapy:
  - Cetuximab (where NCDF criteria are met)
    or
  - Panitumumab (currently not NCDF approved)
  - Irinotecan/Cetuximab (where NCDF criteria are met).
Figure 9.1: Treatment algorithm – KRAS or NRAS mutant disease and wild-type disease

Treatment algorithm – KRAS or NRAS mutant disease

First line
- FOLFOX + bevacizumab
- FOLFIRI + bevacizumab
- FOLFOXIRI + bevacizumab
- Capecitabine + bevacizumab

Second line
- FOLFIRI + afibibercept
- FOLFOX
- Doublet +/- bevacizumab

Elderly/poor performance status

Treatment algorithm – KRAS and NRAS wild-type disease

First line
- FOLFIRI + cetuximab
- FOLFOX + panitumumab
- FOLFOX + bevacizumab
- FOLFOXIRI + bevacizumab
- Capecitabine + bevacizumab

Second line
- FOLFOX + bevacizumab
- FOLFIRI + afibibercept
- FOLFIRI + afibibercept
- Doublet +/- bevacizumab
- Cetuximab

Third line
- Cetuximab
- Cetuximab

Elderly/poor performance status
### 9.3.6 Metastatic regimens

**Table 9.2: Metastatic regimens**

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Capecitabine** | 1,000mg/m² BD PO x 14/7 q 21/7  
1,250mg/m² BD PO x 14/7 q 21/7 |
| **mFOLFOX6** | Oxaliplatin 85mg/m² IV 14-day cycle  
Calcium folinate 350mg IV 14-day cycle  
5-Fluorouracil 400mg/m² bolus IV 14-day cycle  
5-Fluorouracil 2,400mg/m² IVI over 46 hours 14-day cycle |
| **FOLFIRI** | Irinotecan 180mg/m² IV 14-day cycle  
Calcium folinate 350mg IV 14-day cycle  
5-Fluorouracil 400mg/m² bolus IV 14-day cycle  
5-Fluorouracil 2,400mg/m² IVI over 46 hours 14-day cycle |
| **Cape/Ox** | Oxaliplatin 130mg/m² IV 21-day cycle  
Capecitabine 1,000mg/m² BD PO x 14/7 21-day cycle |
| **FOLFOXIRI** | Oxaliplatin 85mg/m² IV 14-day cycle  
Irinotecan 165mg/m² IV 14-day cycle  
Calcium folinate 200mg/m² IV 14-day cycle  
5-Fluorouracil 3,200mg/m² IVI over 46 hours 14-day cycle  
or  
Oxaliplatin 65mg/m² IV 14-day cycle  
Irinotecan 150mg/m² IV 14-day cycle  
Calcium folinate 200mg/m² IV 14-day cycle  
5-Fluorouracil 400mg/m² bolus IV 14-day cycle  
5-Fluorouracil 600mg/m² IVI day 2 and 3 14-day cycle |
| **Bevacizumab** | 5mg/kg IV a 2/52  
7.5mg/kg IV q 3/52 |
| **Cetuximab** | 400mg/m² IV loading dose then 250mg/m² IV weekly  
or  
500mg/m² IV 2-weekly |
| **Panitumumab** | 6mg/kg IV q 2/52 |
| **Aflibercept** | 4mg/kg IV 2-weekly |
| **Raltitrexed** | 3mg/m² IV 3-weekly |
| **Mitomycin C/Capecitabine** | Mitomycin C 7mg/m² IV q 6-weekly  
Capecitabine 1,250mg/m² BD PO x 14/7 q 21/7 |
| **Regorafenib** | 160mg OD PO x 21/28 days |


5 Gruenberger T, Bridgewater JA, Chau I et al. (2013) Randomized, phase II study of bevacizumab with mFOLFOX6 or FOLFOXIRI in patients with initially unresectable liver metastases from colorectal cancer: Resectability and safety in OLIVIA. J Clin Oncol 31, 2013 (suppl; abstr 3619^)

6 Heinemann V, von Weikersthal LF, Decker T et al. (2013) Randomized comparison of FOLFIRI plus cetuximab versus FOLFIRI plus bevacizumab as first-line treatment of KRAS wild-type metastatic colorectal cancer: German AIO study KRK-0306 (FIRE-3). J Clin Oncol 31, 2013 (suppl; abstr LBA3506)

10 Management of Locally Advanced, Recurrent, Metastatic Colorectal Cancer

10.1 Locally advanced primary pelvic disease

Patients with a locally advanced primary pelvic disease are discussed at the specialist colorectal MDT at the local unit. These patients will have been staged with computed tomography (CT) scan of the chest/abdomen/pelvis and magnetic resonance imaging (MRI) of the pelvis. Initial management involves attempted down-staging with neo-adjuvant chemo-radiotherapy (Chapter 12). If the tumour is down-staged sufficiently to make it resectable within a total mesorectal excision (TME) plane, or if it requires removal of the uterus en-bloc, then patients are treated by the relevant local colorectal MDT as long as expertise exists.

If surgery requires an exenteration with removal of nearby organs, especially the sacrum, prostate and bladder, patients are referred to the specialist advanced pelvic cancer MDT for further management. These patients normally undergo a positron emission tomography (PET) CT scan before proceeding to such extensive and radical surgery. Management of these patients will be in line with the ‘Beyond TME’ recommendations published in the British Journal of Surgery in 2013.1

10.2 Local recurrence

The incidence of isolated local recurrence in the LCA should be <10%. It is recognised that surgical management of these patients is challenging and requires an MDT that includes colorectal surgeons, medical and clinical oncologists, imaging specialists, pathologists, orthopaedic surgeons with interest in spinal and sacral surgery, urologists, plastic surgeons and, where appropriate, gynaecologists with an interest in the condition.

It is agreed that all local recurrences will be discussed at the local colorectal MDT meeting. After local recurrence is confirmed and a patient is considered suitable for surgical treatment, they should be referred to the specialist advanced pelvic cancer MDT for discussion and further management which should comply with the ‘Beyond TME’ recommendations. Investigations required to assess suitability for surgery include an MRI scan of the pelvis, CT scan of the chest/abdomen/pelvis and a PET CT.

In patients who are unfit for surgery but with troublesome symptoms such as bleeding, pain, discharge or obstruction, palliative radiotherapy (see Chapter 11) or endoluminal laser palliation should be considered where appropriate.

10.3 Liver deposits

See Appendix 5 for detailed guidance.

All patients with liver deposits suitable for surgical resection will be referred to the relevant specialist hepatobiliary (HPB) MDT for discussion and agreement of a management plan. Treatment may involve either surgical resection, radiofrequency ablation (RFA) of the metastasis or treatment modalities. Prior to undertaking these treatment modalities, patients may undergo a course of down-staging chemotherapy as well as staging investigations such as CT, Teslar MRI or PET/CT scan to exclude disease at distant sites.

For details of surgery, see Appendix 5 (obtained from guidance of the relevant specialty).

For details of adjuvant down-staging therapy, see Appendix 5.
For rationale on the use of PET, see Appendix 5.

10.4 Lung metastases

Some patients with small volume or solitary lung metastases may be suitable for lung resection or image-guided ablation. These patients should be referred to the relevant lung MDT (Royal Brompton & Harefield NHS Foundation Trust, Imperial College Healthcare NHS Trust, St George’s Healthcare NHS Trust, Guy’s and St Thomas’ NHS Foundation Trust) for consideration.

All patients with potentially resectable lung metastases should be worked up as solitary lung nodules with assessment by PET scan, full lung function including transfer factor for carbon monoxide (TLCO), biopsy and tumour markers. With this information they should be referred to the lung MDT for discussion with a thoracic surgeon about resection and/or a clinical oncologist about stereotactic RT.

The lung MDT can provide an opinion as to whether metastases are technically amenable to local treatment (surgery/stereotactic RT/percutaneous ablation). The decision as to whether it is in patients’ best interests to have the metastases resected lies with the colorectal team. Each lung MDT has specific arrangements or requirements for dealing with such referrals.

Criteria for pulmonary metastasectomy

• Primary tumour resected
• No other sites or metastatic disease, except resected or resectable liver metastases
• All of pulmonary disease can be completely resected
• Patient has pulmonary reserve for planned resection.

Almost all patients will have adequate pulmonary reserve, as metastasectomy procedures usually do not require large or lobar resections.

Preferable

Two CT scans 3 months apart to exclude rapid disease progression (i.e. new nodules. Limited or modest increase in size of existing nodules is not significant).

Video-assisted thoracic surgery (VATS) resection of pulmonary metastases should be considered when there is a limited number of nodules (preferably just one) and in a peripheral location, especially when there are sequential CT scans that show no evidence of new nodules developing. This probably allows for a more rapid recovery with less pain, although it does not allow for a thorough manual examination of the lung, which can pick up small, unexpected metastases.

RFA may well be a suitable alternative for the treatment of pulmonary metastases, especially if the nodules are deep (less change of bronchopleural fistula) or if there are concerns about fitness for surgery.

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1 Beyond TME Collaborative (2013) Consensus statement on the multidisciplinary management of patients with recurrent and primary rectal cancer beyond total mesorectal excision planes. Br J Surg 100(8):E1–33
11 Follow-up for Colorectal Cancer

11.1 Reasons for follow-up

There is continuing debate on the benefits of medical follow-up after curative treatment for colorectal cancer, but recent evidence supports this approach over no follow-up. Possible benefits from long-term follow-up are shown below.

**Detection of potentially curable recurrent disease**
- There is evidence that intensive follow-up has a significant effect on survival.
- Liver imaging by ultrasound or computed tomography (CT) some time during the first 2 post-operative years after curative resection may improve the likelihood of being able to offer a potentially curative hepatic resection in 1–3% of patients.

**Detection of metachronous cancers**
- There is no evidence that colonoscopic follow-up improves survival, but it has been shown to produce a high yield of treatable adenomatous polyps and cancer.
- Complete visualisation of the colon by colonoscopy should be undertaken within 6 months of surgery or whenever possible after completion of chemotherapy if this was not done prior to the surgery.
- Once a colon is declared ‘clean’ of polyps and cancers, colonoscopy surveillance should be performed at 3 to 5-yearly intervals as per British Society of Gastroenterology (BSG) guidelines.¹ Patients should be counselled as to the risks from colonoscopy.
- National Institute for Health and Care Excellence (NICE) colonoscopic guidelines² recommend a repeat colonoscopy at 1 year post-op then at 5 years if ‘clean’ colon.
- If adenomatous polyps are found, the examination should be repeated sooner.

**Supportive care**

See survivorship section ([Chapter 19](#)) for full details.

- All patients should have ready access to clinical nurse specialists throughout the period of follow-up.
- An end-of-treatment holistic needs assessment (HNA) should be offered to identify the patient’s holistic needs (see [Appendix 14](#)).
- Onward referral should be made as indicated (e.g. to psychologists).

**Facilitation of audit, quality assurance and clinical governance**

For accurate audit trail of patient progress.

11.2 Suggested strategy for follow-up

To be applied only to patients who:
- would be fit for intervention if recurrence is diagnosed, and
- have received potentially curative surgery.
### 11.2.1 Tumours with favourable prognosis

Table 11.1: Suggested strategy for follow-up

<table>
<thead>
<tr>
<th>Indication</th>
<th>Location of follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>pT1, pT2, some pT3s, N0 M0</td>
<td>Hospital of diagnosis</td>
</tr>
</tbody>
</table>

**Outpatients**
- Surgical outpatient appointment (OPA) within 6 weeks of discharge following surgery
- Annual surgical OPA for 5 years, either in normal outpatients, nurse-led follow-up clinic or by remote monitoring with GP support
- Any additional OPA at request of patient, CNS or surgeon

**Carcinoembryonic antigen (CEA)**
- 6-monthly prior OPA

**CT abdomen and chest**
- CT liver within 6 months if not done prior to surgery
- At least 2 CT scans on abdomen and pelvis for first 3 years

**Colonoscopy**
- The British Society of Gastroenterology guidelines and NICE guidelines should be used as a framework for colonoscopy surveillance. Individual hospitals/clinicians may undertake additional examinations if clinical circumstance dictates. However, the following is a general guide:
- Full colonoscopy within 6–12 months of treatment if a full colonoscopy was not performed prior to treatment
- At 3 years, if a full adenoma-free colonoscopy was not performed prior to treatment
- If adenomas are found during the above colonoscopies, further surveillance is indicated according to BSG guidelines
- If no adenoma is found during the above investigations, surveillance is 5-yearly <70 years of age
- In addition, NICE guidelines suggest a colonoscopy at 1 year after treatment and if clear at 5 years
- Therefore, MDTs will have the flexibility of undertaking a colonoscopy examination either at 1 or 3 years and then at 5 years, depending on the agreement with local CCGs.

Terms: N0: no regional lymph node metastasis; M0: no distant metastasis
11.2.2 Tumours with unfavourable prognosis

Table 11.2: Follow-up for tumours with unfavourable progress

<table>
<thead>
<tr>
<th>Indication</th>
<th>Location of follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>pT3, pT4, N1–2 M0-1</td>
<td>Patients will be offered adjuvant therapy and will be followed up in the oncology clinic for tumour markers and CTs/MRIs as well as in the surgical clinic for colonoscopy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outpatients</th>
<th>Surgical OPA as described above</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oncology OPA:</td>
</tr>
<tr>
<td></td>
<td>3-monthly appointment for the first year</td>
</tr>
<tr>
<td></td>
<td>6-monthly appointments in years 2 and 3</td>
</tr>
<tr>
<td></td>
<td>Annually in years 4 and 5.</td>
</tr>
<tr>
<td>CEA</td>
<td>At each oncology OPA</td>
</tr>
<tr>
<td>CT abdomen and chest</td>
<td>Annually until year 3, arranged by oncology unit</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>As protocol above, arranged by surgical clinic.</td>
</tr>
</tbody>
</table>

The protocol/guidance in Table 11.2 should be supplemented with additional or more frequent assessment if clinical judgement dictates.

11.3 Stratified follow-up of colorectal cancer patients

The LCA Colorectal Pathway Group supports the introduction of stratified follow-up protocols that can be tailored to the local practice of individual Trusts. The principle of stratified follow-up relies on empowering patients to make an informed choice about how they wish to be followed up.

Results from follow-up diagnostic tests are monitored by the Trust, but the patient only returns to clinic (within 14 days) if their results are of concern and require further investigation. The patient is supported during the follow-up period by appropriate education on signs and symptoms, coupled with comprehensive patient information. There is also a dedicated helpline for advice and the guarantee of a clinic appointment within 14 days in the event of symptoms of concern.

The operational policy for stratified follow-up for colorectal cancer is outlined in Appendix 12.

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12  Hereditary Colorectal Cancer Service

Heritable factors account for 35% of colorectal cancer risk. Each multidisciplinary team (MDT) has a responsibility to develop clear pathways for the management of these patients according to Association of Coloproctology of Great Britain and Ireland/British Society of Gastroenterology 2010 guidelines.\(^1\) There are designated genetic centres and other specialist services available within the London Cancer Alliance and consideration should be given to an early referral to the local or regional family screening clinic for risk assessment from the MDT.

Key priorities for each MDT include:

- Designation of a single MDT lead with responsibility for the local management of hereditary colorectal cancer patients
- Establish links with regional genetics service
- Development of local guidelines to ensure that clearly defined pathways to genetic testing are in place for these patients
- A screening registry in each Trust to ensure correct follow-up for patients and their families, and to aid recruitment to clinical trials
- Use of the revised Bethesda criteria\(^2\) at the time of the MDT to determine who should undergo tumour histology testing for Lynch syndrome.

12.1  Referral threshold to secondary care

12.1.1 Low-risk groups

Although many of these patients may seek reassurance, according to national guidelines they do not require screening above and beyond the rest of the population (i.e. Bowel Cancer Screening Programme).

- First-degree relatives (FDR) with colorectal cancer >50 years at diagnosis
- Second-degree relatives (SDR) with colorectal cancer
- Family history of any relative with <10 polyps found on colonoscopy.

12.1.2 Moderate-risk groups

Those with moderate risk should be referred for assessment for screening from the age of 50 years onwards and not before in the absence of other indications.

- One FDR with colorectal cancer <50 years at diagnosis
- \(\geq\) Two FDRs with colorectal cancer at any age (the patient must be a FDR of only one affected individual).

12.1.3 High-risk groups

Those with high risk should be referred at any age. They account for approximately 5% of all bowel cancer. Documentation of the high-risk status should be obtained in advance of screening.

- 3 FDRs with colorectal cancer – one diagnosed <50 (e.g. Lynch syndrome or hereditary non-polyposis colorectal cancer)
• A family history with multiple affected members in more than one generation
• A previously characterised high-risk patient or relative (i.e. with a known cancer syndrome such as familial adenomatous polyposis coli (FAP)) not currently undergoing surveillance
• The presence of a germline pathogenic mutation in a colorectal cancer susceptibility gene if previously tested.

12.2 Screening protocols

Moderate risk patients – screening is empirically derived from family history, and screening should begin only at age 50 years, not before.

Table 12.1: Screening protocol according to risk

<table>
<thead>
<tr>
<th>Category</th>
<th>Family history</th>
<th>Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>High moderate risk</td>
<td>3 FDR none &lt;50 years</td>
<td>From 50 years, every 5 years</td>
</tr>
<tr>
<td></td>
<td>3 FDR average age &lt;60 years</td>
<td></td>
</tr>
<tr>
<td>Low moderate risk</td>
<td>2 FDR average age &gt;60 years</td>
<td>Single colonoscopy age 55 years</td>
</tr>
<tr>
<td></td>
<td>1 FDR age &lt;50 years</td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>1 FDR &gt;50 years</td>
<td>Bowel Cancer Screening Programme</td>
</tr>
</tbody>
</table>

12.3 Lynch syndrome

12.3.1 Assessment

• At the time of the initial colorectal MDM (i.e. at diagnosis) all patients with colorectal cancer should be assessed according to the revised Bethesda guidelines (see Figure 12.1), which advocate testing a colorectal cancer for microsatellite instability (MSI) in the following situations:
  – The patient is under 50 years old.
  – The patient has synchronous or metachronous colorectal tumours, or other Lynch syndrome-associated tumours (regardless of age).
  – The colorectal cancer has histological features of high MSI, and the patient is under 60 years old.
  – The patient has at least one FDR with a Lynch syndrome-associated tumour diagnosed under the age of 50 years.
  – The patient has two or more FDRs with Lynch syndrome-associated tumours (regardless of age).

• Approximately 20% of patients will fulfil one of these guidelines. Biopsies or resection specimens may be tested with immunohistochemistry (IHC) for Lynch syndrome-associated changes. Alternatively, they may be tested for DNA microsatellite instability (MI) although this test is more expensive.

• Histological features associated with this condition include signet-ring type, mucinous, lymphocytic infiltrate, Crohn’s-like, medullary-type appearances. If these tumours are found to have abnormal IHC or MSI testing, the patient may be referred to clinical genetics for genetic counselling and germline testing.

• A minority of patients will belong to families that fulfil the clinical Amsterdam criteria— that is, three FDRs over two generations, with one diagnosed under 50 years. Those who meet Amsterdam criteria but test negative with IHC/MSI may have colonoscopic surveillance from age 35–40 and every 5 years.
Figure 12.1: Cost-effective algorithm for the assessment and initial tumour testing of suspected Lynch syndrome patients by local colorectal multidisciplinary teams, with referral to specialist genetics services for more advanced testing.

12.3.2 Management

For those with a proven underlying germline mutation, or who meet the Amsterdam criteria or are an FDR of one of these affected individuals:

- Patients should have a colonoscopy every 18–24 months beginning at age 20–25 years until 75 years of age minimum. Consider chromoendoscopy as the neoplasia often manifest as right-sided flat lesions.
- Aspirin 75mg once daily is recommended for prophylaxis.
- Patients should consider prophylactic total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAH-BSO) at age ~40 years.
- Extensive rather than segmental resection should be considered in these patients because of high lifetime risk of metachronous colorectal cancer.

12.4 Polyposis syndromes

Patients with FAP, MAP, Peutz-Jeghers and other highly penetrant polyposis syndromes should be referred to a specialist centre for management at any age. Guidelines for surveillance for these highly penetrant syndromes are in Appendix 8.

Further details are also available at http://familyhistorybowelcancer.wordpress.com/

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13 Anal Cancer Guidelines

Anal cancer is rare and constitutes 1–2% of all gastrointestinal malignancies. Fewer than 1,200 patients present with the disease in the UK each year. The incidence rate is 1.3 per 100,000 population for men and 2.1 per 100,000 population for women. The current 1-year relative survival is 84%. HPV infection is the major risk factor for anal cancer and in addition some studies suggest that smoking increases the risk of developing anal cancer.

13.1 Diagnosing and staging of anal cancer

The vast majority of patients present to their GPs with local anorectal symptoms such as rectal bleeding, itching, pain or swelling around the anus, or a discharge of mucus from the anus. Depending on the presentation to the GP, these patients are either referred under the 2-week rule for a suspected colorectal cancer or referred to the local colorectal clinic as suspected haemorrhoids, fissures and so on. In 20% of cases, anal cancer do not present with symptoms but are diagnosed incidentally as part of assessment of the anorectum.

Once suspected, either in the colorectal clinic or during endoscopy, a biopsy should be obtained for histology. If this is not possible or is likely to be painful, patients should be examined under anaesthetic with a view to assessment and biopsy. On occasions, a diagnosis is made unexpectedly after excision of what may have been thought to be a haemorrhoidal swelling.

As in rectal cancer, all histologically proven anal cancers should undergo magnetic resonance imaging (MRI) of the pelvis and a computed tomography (CT) scan of chest, abdomen and pelvis with views of the groin. It may be necessary to carry out a fine needle aspiration (FNA) of the groin nodes to obtain cytological confirmation of a cancer, or use positron emission tomography (PET) to determine the extent of nodal involvement, as these will assist radiotherapy planning.

If not already done, proctoscopy plus genital examination/gynaecological assessment in women, including colposcopy, should be undertaken. Furthermore, a consideration should be made for human immunodeficiency virus (HIV) testing on the basis of clinical context – often but not always for younger males – since anal cancer treatment and outcome may be impaired where HIV-disease is unrecognised and untreated.

13.2 Referral for anal cancer (histological diagnosis of an anal cancer)

- As soon as an anal cancer is diagnosed at any Trust within the LCA, the patient should be referred for discussion at the specialist anal cancer MDT. It is the responsibility of the consultant in charge, clinical nurse specialist (CNS) or the registrar to complete the referral and fax to the anal cancer MDT coordinator.
- The patient’s clinical letters, imaging and histopathology should be sent within the week to the anal cancer MDT for review at its meeting.
- The consultant, CNS or registrar referring the patient should inform the patient of the diagnosis and of the onward tertiary referral.
13.3 The specialist anal cancer MDT

The anal cancer MDT acts as a standalone MDT and includes members who have specific interest in the management of anal cancer in addition to colorectal specialist expertise.

The anal cancer MDT meets weekly.

Membership of the MDT will include those with similar roles to the colorectal core and extended MDT teams and include a consultant surgeon responsible for anal cancer surgery and a clinical oncologist responsible for all curative chemotherapy and/or radiotherapy for anal cancer. In addition, the team will have access to a consultant plastic surgeon and a gynaecologist with expertise in vulval cancer.

All patients with a new diagnosis of residual or recurrent anal cancer within the LCA will be referred to the specialist anal MDT for discussion as per the agreed referral process.

A representative from each unit MDT may choose to attend the anal specialist MDT to present a patient with anal cancer, particularly if this patient originated from their unit.

13.4 Treatment of anal cancer

The treatment is primarily by chemo-radiation irrespective of the stage at presentation, although salvage surgery in the form of abdomino-perineal excision of rectum and anus (APER) is undertaken for residual/recurrent resectable disease. In situations where anal cancer is diagnosed unexpectedly following surgery for an anal lump, whether totally excised or not, patients may still receive chemo-radiotherapy (CRT) if fit (subject to staging and discussion at the anal MDT).

13.5 Surgery for anal cancer

Excision biopsy should only be considered for small T1 lesions where there is a high confidence of negative margins, since delivery of chemo-radiation to residual disease after excision biopsy with positive margins is compromised by an associated infected wound cavity. The defect can usually be closed by simple advancement flaps, with or without faecal diversion as appropriate.

Defunctioning stoma, prior to chemo-radiation, may be considered if it seems likely that faecal incontinence or difficulty with defecation will impair delivery of the full therapeutic dose of chemo-radiation. If so, the stoma should be sited higher on the abdomen away from the suprapubic radiation beam.

Salvage surgery in the form of APER is undertaken for residual/recurrent resectable disease, as treatment is primarily by chemo-radiation irrespective of the stage at presentation. In situations where anal cancer is diagnosed unexpectedly following surgery for an anal lump whether totally excised or not, patients may still receive chemo-radiotherapy if fit (subject to staging and discussion at anal MDT).

Where salvage APER is required, the patient is still under the care of the anal cancer MDT and is therefore referred by the clinical oncologist in charge of their care to the LCA designated anal cancer surgeons for treatment. Information will be given to patients about transfer of care from one member of the team to another.
13.6 Chemo-radiotherapy

Radiotherapy is usually planned as per the ACT II Protocol. For T1N0 or T2N0 tumours in the elderly, a modified regime with limited fields can be used (as per ACT II Phase II throughout treatment).

Anal squamous cell carcinomas (SCCs) are highly radiosensitive and the majority will be cured by chemo-radiotherapy. Treatment interruptions and delays should therefore be minimised and departments should treat these patients as Category 1.

13.6.1 Conventional radiotherapy planning

The patient is CT scanned prone, immobilised on a belly board, or supine. The patient must have a comfortably full bladder to push small bowel superiorly and an empty rectum. An anal marker must be positioned pre-scan. Bolus can be added at this stage as clinically necessary or added later after CT planning. Wire to nodes as necessary.

CT scan performed with 3–5mm slices from L3 to 3cm below anus or the lowest extent of marked tumour. Intravenous (IV) contrast is preferable to aid nodal delineation.

All palpable disease on the anal margin and all palpable lymph nodes should be marked with wire for the purposes of simulation. Clinicians may find it helpful to wire the inguinal nodal region to help determine the lateral border of the Phase I field.

Any of the following techniques can be utilised.

13.6.2 Parallel opposed Phase I

Large parallel opposed fields to include all macroscopic disease and both inguino-femoral regions. It is essential that all macroscopic disease around the anal margin and any enlarged inguinal or femoral nodes are marked with radio-opaque material at the time of simulating Phase I. It is intended that the gross tumour volume (GTV) is defined at the start of treatment (in some patients it may shrink prior to Phase II planning). Superior border 2cm above the bottom of the sacroiliac joint (SIJ). Inferior border 3cm below the anal margin or inferior extent of the tumour. Lateral borders lateral to femoral heads.

13.6.3 Phase II (planned at the same time as Phase I) – virtual simulation or CT planned volume

The technique used is different depending on the presence or absence of significant lymphadenopathy in the inguino-femoral region or in the pelvic nodes on CT scan. In the case of clinically impalpable nodes visible on CT scan, the nodes should be treated to Schedule B (50.4Gy) if they are thought likely to contain tumour (or are positive on biopsy).

This phase may be planned using orthogonal films or CT planning. It is essential, whether orthogonal films or CT planning are used, that all visible tumour at and around the anal margin is marked using a radio-opaque marker. If the disease is confined to the anal canal, then a radio-opaque marker on the anal verge is essential.

Patients with no inguinal, femoral or pelvic lymphadenopathy (N0) at the time of diagnosis

- All borders are defined as field and are 3cm around the GTV defined at initial simulation – CT planned volume or VSIM.
- Superior field border 3cm above superior extent of GTV.
• Inferior field border as Phase I – 3cm below the anal margin (for disease confined to the anal canal only) or 3cm below the most inferior extent of tumour (for anal margin tumours).
• Lateral field border 3cm lateral to the most lateral extent of the GTV.
• Anterior field border 3cm anterior to the anterior extent of GTV.
• Arrangement of portals for a three or four field plan (for all patients with anal canal tumours). For patients with disease confined to the anal margin only, a single direct field is acceptable. If a single field is used, a vertical field is most convenient using a 3cm margin around the GTV.

**Patients with inguinal femoral or pelvic lymphadenopathy (N+)**
• Parallel opposed fields are usually used. All macroscopic disease will be considered as GTV and marked at the time of initial simulation (primary tumour and all palpable inguinofemoral lymphadenopathy).

**Concomitant chemotherapy**
• 5-Fluorouracil (5FU) 1,000 mg/m²/day – days 1–4 and 29–32 by continuous 24-hour IV infusion through a PICC or Hickman line and mitomycin C 12 mg/m² by IV bolus on day 1 only (maximum single dose 20 mg).
• Dose reductions for GFR 50 – 59ml/min at randomisation – 5FU full dose, mitomycin C 8 mg/m² by IV bolus injection on day 1 only.
• Capecitabine 825mg/m² BD can be substituted instead of 5FU if budgets allow.
• The ACT II trial², and RTOG studies³ confirm no additional benefit for cisplatin over mitomycin (although there is less haematological toxicity), and no benefit of maintenance cisplatin/5FU chemotherapy following completion of radiotherapy. Some centres administer a second dose of mitomycin C in week 5 (this is common in the US).

**Selection of optimal plan and normal tissue dose constraints (Phase II)**
• PTV max <107%
• PTV coverage with 95% isodose
• Avoid hot spots, especially those over the small bowel
• Patients with a large volume of air in the rectum may need to be rescanned at the clinician’s discretion
• Try to keep the femoral head dose <70%
• Normal tissue constraints
• Small bowel dose <45Gy to any point.

**Dose prescription (radiotherapy)**
• Phase I – 30.6Gy in 17# to MPD
• Phase II – 19.8Gy in 11# to MPD or as a planned volume to 100%.
 Alternatives:
• 50.4–54Gy in 28–30# to a planned volume 100%
• 50Gy in 25# to 100%
• Boosts can be used at the clinician’s discretion at the end of treatment using either photons or electrons or brachytherapy. Prescription would normally boost tumour dose to around 60Gy.
Conformal planning with electrons

A 3D conformal plan arrangement can be utilised for the duration of the patient treatment with supplemental electron fields to the inguinal areas. This technique, while more conformal than the standard, is heavy on linac time, and has been superseded by IMRT planning techniques.

13.7 Anal cancer IMRT protocol

Patients are immobilised prone on a belly board, or supine, with a comfortably full bladder (routinely 350ml of water is to be given 45 minutes before the scan) and an empty rectum. This is to push the small bowel superiorly.

Fusion of the MRI scan (axial T1 post-contrast images) and planning CT scan may be helpful in target definition but must be requested in advance. This is helpful and advisable, but not mandatory. Discuss with radiation physics beforehand.

13.7.1 IMRT – delineation of target volumes

The GTV is defined as all known gross disease determined from CT, MRI or PET, clinical information, digital examination, endoscopic findings and biopsy. The imaging modality used to define the GTV can be specified in brackets, for example ‘GTV-T (MRI)’.

The GTV should be outlined as follows:

- **GTV-T** – includes the gross primary anal tumour volume (as documented by digital exam, and as seen on CT, and PET or MRI), which will receive 50–54Gy
- **GTV-N50** – includes all involved nodal regions (as documented by biopsy or scans) which will also receive 50–54Gy
- **Clinical target volume (CTV)-T** – for the primary anal tumour volume. CTV-T includes the GTV-T, the anal canal and a 2.5cm expansion (except into bone or air)
- **CTV-N42** – for the elective nodal regions (uninvolved nodal regions will receive 42Gy)
- **CTV-N50** – for involved nodal regions <3cm, which will receive 50Gy
- **CTV-N54** – for involved nodal regions >3cm, which will receive 50–54Gy
- **CTV-N42, CTV-N50, CTV-N54** – includes the nodal regions (respectively unmved, involved with nodes <3cm and involved with nodes >3cm) and a 1.0cm expansion (except into uninvolved bone, genito-urinary structures, muscles or bowel).

Nodal regions to be covered include:

- **Mesorectal** (including peri-rectal and presacral)
- **Right and left inguinal/inguino-femoral**
- **Right and left external iliac**
- **Right and left internal iliac/obturator**.

The nodes should be outlined using the following as a guide only:

RTOG Atlas, available at:

[http://atc.wustl.edu/protocols/rtog-closed/0529/ANAL_Ca_CTVs_5-21-07_Final.pdf](http://atc.wustl.edu/protocols/rtog-closed/0529/ANAL_Ca_CTVs_5-21-07_Final.pdf)

Extreme care must be taken especially medially, superiorly and inferiorly with the inguinal nodal definition to avoid possible geographic miss. The atlas is a guide only, and there can be considerable variation among patients. The opinion of a radiologist should be sought if there is any doubt as to the volume definition.

The planning target volume (PTV) will provide a margin around the CTV to compensate for the variables of treatment set-up and internal organ motion. A minimum of 1cm around the CTV is required in all directions to define each respective PTV.

A nodal PTV (PTV-N42, PTV-N50, PTV-N54) should not be allowed to overlap with the primary PTV-T if their dose objectives are different, so that the maximum dose to the nodal PTV can be controlled in the optimisation.

Target tumour volumes are delineated slice by slice on the treatment planning CT images. The PTVs should **sparing non-target skin surfaces** (manually or automatically trimmed to 3–5mm within the skin surface).

The patient will normally be treated using a simultaneous integrated boost (SIB) technique with differing dose per fraction across multiple target volumes.

### 13.7.2 IMRT – delineation of critical normal structures (organs at risk)

Surrounding critical normal structures should be outlined, including:

- Femoral heads (right and left)
- Bladder
- External genitalia
- Bowel (above recto-sigmoid junction)
- Small bowel or peritoneal cavity
- Rectum outside the CTVs
- Perianal skin and perineal skin
- Pelvic/sacral bone marrow (optional) – outer table of pelvis, sacrum, femoral heads.

### 13.8 Dose

Dose prescribed depends on the stage of the primary cancer. Dose should be prescribed to 100% or as per departmental policy.

- **T1/T2N0** – 50.4Gy in 28# (1.8Gy per fraction) daily to the primary, and 42Gy in 28# (1.5Gy per fraction) to the elective nodal regions
- **T3N0 and T4N0** – 50.4–54Gy in 28–30# daily to the primary (1.8Gy per fraction) and 42–45Gy in 28–30# to the nodal regions (1.5Gy per fraction)
- **Node positive disease** – 50.4–54Gy in 28–30# to the primary in 1.8Gy per fraction:
  - Involved nodes: treat the involved nodal volume to 50.4–54Gy in 28–30# (1.8Gy per fraction)
  - Uninvolved nodal regions: receive 42–45Gy in 28–30# (1.5Gy per fraction)
- A backup AP-PA plan should also be produced for all patients in case of extended machine breakdown.
Boost: in patients with bulky disease or residual disease at the end of treatment, the dose to the primary or involved nodes can be boosted with further fractions of IMRT radiotherapy to 59.4–61.2Gy in 33–34#. Alternatives could include direct electron field to the primary or consideration of brachytherapy.

13.8.1 Minimum dose specification

The prescription isodose surface will encompass at least 90% of the primary and involved nodal PTVs and at least 85% of the uninvolved nodal PTVs, reflecting the inherent difficulty of covering the shallow portions of these targets.

- No more than 5% of any PTV will receive <95% or >105% of the prescription dose.
- No more than 2% of any PTV will receive <93% of the prescription dose.
- No more than 2% of the primary PTV will receive >107% of the prescription dose.

13.8.2 Tolerances for organs at risk

Critical normal structures: DVHs must be generated for all critical normal structures.

Constraints are listed in order from most to least important in terms of priority setting for dosimetrists.

Femoral heads:
- No more than 50% above 30Gy (V30 <50%)
- No more than 35% above 40Gy (V40 <35%)
- No more than 5% above 44Gy (V44 <5%).

External genitalia:
- No more than 50% above 20Gy (V20 <50%)
- No more than 35% above 30Gy (V30 <35%)
- No more than 5% above 40Gy (V40 <5%).

Bladder:
- No more than 50% above 35Gy (V35 <50%)
- No more than 35% above 40Gy (V40 <35%)
- No more than 5% above 50Gy (V50 <5%).

Rectum:
- No more than 200cc above 30Gy (V30 <200cc)
- No more than 150cc above 35Gy (V35 <150cc)
- No more than 20cc above 45Gy (V45 <20cc).

Bowel:
- No more than 200cc above 30Gy (V30 <200cc)
- No more than 150cc above 35Gy (V35 <150cc)
- No more than 20cc above 45Gy (V45 <20cc)
- None above 50Gy.
Pelvic bone marrow (outer table of bony pelvis and sacrum):

- Mean dose <25Gy maximum but ideally <20Gy.

Skin:

- No specified tolerance, but as low as achievable.

13.9 Patient management during radical radiotherapy

The patient should be reviewed by a doctor, clinic radiographer or nurse weekly during treatment and more often if clinically necessary. Patients should be asked specifically about chemotherapy toxicity, rectal bleeding, skin reaction, diarrhoea, symptoms of radiation cystitis, symptoms of proctitis, and tenesmus, and managed accordingly. Post-treatment MRI scans, EUA and follow-up appointments should also be arranged.

13.10 Blood monitoring

A full blood count (FBC), urea and electrolytes (U&E) and liver function test (LFT) should routinely be performed weekly to assess chemotherapy toxicity and chemo/radiation-induced pelvic bone marrow effect. These bloods should be performed more often as necessary. Suspension of chemotherapy or radiotherapy for low blood counts should be as per departmental guidelines.

Grade 3/4 moist desquamation is an expected toxicity. There are no formal criteria for interrupting radiotherapy but this may be done at the clinician’s discretion. Clinicians may wish to interrupt radiotherapy for other reasons such as severe urinary toxicity or abdominal cramps with tenderness or peritonism. Treatment interruptions should be minimised and compensated for by hyperfractionating or BED correction on dose per fraction.

Patients should be seen 6 weeks after the completion of radiotherapy. A follow-up appointment will be made at the referring hospital with the consultant clinical oncologist. Liaise with local surgeons regarding post-treatment MRI scan, EUA and biopsies to assess the effect of treatment (usually around 3 months post completion of radiotherapy).

Chemotherapy in the first and fifth week of radiotherapy:

- Week 1: 5FU 1,000mg/m² D1–4 as continuous infusion with mitomycin C 12mg/m² D1
- Week 5: 5FU 1,000mg/m² D1–4 as continuous infusion.

Also see local chemotherapy protocols.

13.11 Patient ‘timetable’ for treatment of anal carcinoma

- The decision to treat and the start of treatment must be within 31 days and 62 days of referral respectively.
- CRT should be arranged as per the policy for organising radiotherapy.
- A letter must be sent to the surgical team by the oncology team informing them of the date of completion of radiotherapy.
- Clinical review by the clinical oncology team should be at 4 weeks following completion of chemoradiation treatment to exclude progression.
• EUA and biopsy of suspicious areas should be undertaken 18 weeks from the start of chemo-radiation (approximately 12 weeks following completion of chemo-radiation) with CT scan and MRI.

13.12 Follow-up

There should be an initial follow-up at about 4 weeks following completion of treatment when a clinical examination is performed. If there is clinical evidence of response, then imaging can be scheduled for 12 weeks after completion of treatment. At this point an MRI of the pelvis and a CT scan of the chest, abdomen and pelvis should be done, and further clinical examination performed.

Provided there is continued tumour regression, either clinically or on imaging, then EUA and biopsy are not required. Anal cancers may take many months to fully regress so the emphasis should be on obtaining evidence that there is continued response. A positive early biopsy (within 3 months of chemo-radiation) in the context of regressing disease is compatible with an eventual complete response. If either clinical examination or imaging at 12 weeks from treatment or subsequently causes concern that disease is not regressing, then biopsy is required.

Follow-up should be undertaken by the surgical and oncology teams (with careful documentation of treatment-related toxicity) on an alternating basis according to the following schedule (Table 13.1). Where there is complete regression, follow-up should be clinically with DRE, proctoscopy (or EUA if not tolerated) and inguinal lymph node palpation, and radiologically.

Table 13.1: Patient follow-up guidelines following chemoradiotherapy treatment for anal cancer

<table>
<thead>
<tr>
<th>Time following completion of primary treatment</th>
<th>Frequency of clinic appointment</th>
<th>Time points for CT scan and MRI pelvis (following start of primary treatment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td>3-monthly</td>
<td>At 6 months (MRI) and at 1 year (CT/MRI)</td>
</tr>
<tr>
<td>Year 2</td>
<td>3-monthly</td>
<td>2 years (CT/MRI)</td>
</tr>
<tr>
<td>Years 3–5</td>
<td>6-monthly</td>
<td>Clinical suspicion only</td>
</tr>
<tr>
<td>&gt;Year 5</td>
<td>Discharge</td>
<td></td>
</tr>
</tbody>
</table>

Appointments with a CNS should be available to underpin ongoing supported self-management and survivorship needs. See Chapter 19 for full details.

Patients treated within the ACT II protocol

These patients will be followed up according to the ACT II protocol.

Patients treated outside the ACT II protocol

On completion of chemo-radiation, patients will be followed up as outlined below:

• 4 weeks post completion of chemo-radiation, patients will attend a clinical oncology outpatient review with digital examination.

• 12 weeks post completion of chemo-radiation, patients will have a clinical oncology review with digital examination/baseline post-treatment MR/baseline post-treatment CT.
Thereafter, follow-up will be 3-monthly until 2 years. At each year anniversary, patients will also be seen in the surgical clinic when proctoscopy will be performed. Biopsy will be avoided unless there is clinical suspicion of recurrent disease and no routine biopsies are taken.

Year 2 – patients will be seen 4-monthly in the clinical oncology clinic with digital examination on each occasion.

Year 4 and 5 – patients will be seen 6-monthly in the clinical oncology clinic with digital examination on each occasion.

If there is concern about the findings on digital examination at any point during the course of follow-up, the patient will be referred back to the original surgeon for assessment with EUA and biopsy.

### 13.13 Recurrence

Patients with biopsy-proven disease that is not regressing by 3 months from treatment or subsequently, and patients where there has been regression with subsequent local regrowth, should be considered for APER, usually with perineal flap reconstruction. Prior to a final decision about salvage surgery, these patients should be restaged with a CT scan of the chest, abdomen and pelvis, and an MRI scan of the pelvis, to exclude metastatic or advanced loco-regional disease.

Options in patients with involved inguinal nodes are radiation where nodes have not been irradiated, or radical inguinal node clearance.

Patients with distant metastases may be offered cisplatin-based chemotherapy or entered into a trial. Although there is no evidence for resection of metastatic disease, there are case reports of successful liver resection in selected patients and this can be considered.

### 13.14 Anal cancer in HIV-positive patients

There is a high prevalence of anal canal human papilloma virus (HPV) infection in males who have sex with males (MSM) that may also be associated with HIV infection. This association results in a much higher prevalence of anal cancer in situ and invasive squamous carcinoma than in the general population. National Institute for Health and Care Excellence (NICE)-approved guidelines for management of HIV-related malignancies published by the British HIV Association state that:

“All patients with HIV and malignancy should be referred to centres that have developed expertise in the management of these diseases (level of evidence 1B). The multidisciplinary team managing these patients must include HIV physicians, oncologists, haematologists and palliative care physicians along with clinical nurse specialists, specialist HIV pharmacists and specialist chemotherapy pharmacists.”

There are particular considerations in the context of managing anal cancer associated with HIV, including:

- Aceto-white screening anoscopy and management of the high prevalence of early cancer
- The co-administration of HAART with CRT or salvage surgery to ensure optimal cancer treatment without developing HAART resistance
- Psychosocial issues associated with a predominantly young MSM population.

A significant proportion of total UK patients falling into this category are treated within a few centres within the LCA area. Published outcomes from one of the HIV cancer units treating this patient group within the
LCA area suggest that anal cancer treatment results – from in-situ disease to salvage surgery – for HIV individuals managed within this environment are as good as those published for the general population.

The need for HIV testing should be considered in all new diagnoses of anal cancer in the LCA area. With regard to clinical context – often but not always, younger males than in the general anal cancer population – since anal cancer treatment and outcome may be impaired where HIV-disease is unrecognised and untreated. All patients with HIV-associated anal cancer should be managed within an HIV-related anal cancer unit with infrastructure to offer cancer treatment, and HIV and cancer follow-up treatment and surveillance.

Suggested management of patients with AIN could be as per algorithm in Figure 13.1 (ACPGBI position statement on anal cancer 2012). In addition, all female patients should also be referred to gynaecology for surveillance of cervical intraepithelial neoplasia (CIN) and vulval intraepithelial neoplasia (VIN).

**Figure 13.1 Management of anal intraepithelial neoplasia (AIN)**

Possible algorithm

![Possible algorithm diagram](source: Abbasakoor and Boulos, 2005 www.acpgbi.org.uk/content/uploads/Anal_Cancer_Position_Statement.pdf)

All female patients referred to gynaecology for surveillance of cervical intraepithelial neoplasia (CIN) and vulval intraepithelial neoplasia (VIN).


14 Breaking Bad News

Staff dealing with patients and giving diagnoses of cancer should have received training in advanced communication skills. Bad news should only be given by appropriately trained clinicians. This chapter provides a summary of the key points.

Advance preparation

• Consider the time available, put your pager on silent mode and find a private setting.
• If the patient is an inpatient, consider the setting and ensure that you cannot be overheard by other people on the ward.
• Would it be helpful to have another member of staff present? It is recommended that a clinical nurse specialist (CNS) is present when delivering bad news and should always be available to provide support during that day.
• Before seeing the patient, review relevant clinical information, consider psychological/social issues and mentally rehearse words or phrases to use or avoid.

Build a therapeutic environment

• Introduce yourself.
• Ask the patient if they would like someone else with them.
• Be aware of your body language.

Communication

• Ask what the patient already knows.
• Warn the patient that you do not have good news.
• Proceed at the patient’s pace.
• Be frank but compassionate.
• Avoid jargon.
• Allow for silence and tears.
• Check the patient’s understanding.
• Repeat information if needed.
• Allow time for discussion.
• Outline the next steps in the treatment plan and provide written information. This should include details of any treatments, where appropriate.
• Offer a follow-up meeting.
• Ensure that the patient has details of their key worker and how to contact them should the need arise.
Dealing with reactions

- Be aware of family/patient reactions and acknowledge their emotional needs.
- Be empathic.
- Offer support from other members of the multidisciplinary team (MDT) if needed.
- Do not show any signs of rushing away from the meeting.
- Avoid confrontational scenarios.
- Be aware of your own safety.
- Do not criticise or argue with colleagues.
- Deal with your own emotional needs and the needs of other colleagues.
- Allow time for reflection.
15 Patient Support

- Patients will be offered copies of the correspondence with their GP according to Trust policy.
- The multidisciplinary team (MDT) will offer patients a treatment summary, which will include: diagnosis, treatment options and plan, relevant follow-up and discharge arrangements.
- Each patient will be provided with a contact name and number for a colorectal nurse specialist and a key worker (Appendix 6), if different, as a first point of contact.
- Written information will be provided and offered to the patient. This will be specific to the patient’s cancer and local services, including support services (e.g. living with cancer, social and psychological support) and patient involvement/self-help groups. The nurse specialist supports the patient through their pathway and informs them of local support groups.
- Patients will be offered a choice of appointments and treatment dates.
- The MDT should obtain regular feedback on patients’ experiences of the services offered via questionnaires, focus groups and so on. These findings should be presented and discussed at the MDT and utilised in service improvement work.
16 Communication with GPs and Tertiary Referrers

Wherever possible, the patient will be given the diagnosis of cancer in the presence of the colorectal nurse specialist. Where this is not possible, the colorectal nurse specialist will be informed on the same day. Within 24 hours, the GP will be notified of the diagnosis and discussions with the patient, and will be notified about the plan for management that was agreed with the patient.

The tertiary unit consultants/receiving team will be notified on the same day as the multidisciplinary team (MDT) by fax of the MDT outcome proforma. Where urgent discussion is required, the consultant or member of the team will be contacted by telephone.

The MDT coordinator/secretary will monitor the timeliness of communication with GPs by running quarterly audits, where appropriate, to ensure that >90% of communications have been received by the GP practice within 48 hours.
17 Waiting Times

The pathway group is committed to achieving the national cancer waiting times targets as laid down by the Department of Health. The waiting times are as follows:

- Patients referred under the 2-week rule/urgent suspected cancer (USC) are seen by a specialist within 2 weeks.
- For target wait/USC patients, there is a maximum of 62 days from referral to first treatment.
- For all patients, there is a maximum of 31 days from the date of the decision to treat (when the patient and the clinician agree the treatment plan) until the first treatment.

Data is routinely collected at the multidisciplinary team (MDT) meetings of the date of the decision to treat and the date of first treatment, which can be either surgery, chemotherapy or radiotherapy. All members of the MDT are committed to working to help achieve cancer waiting time targets for all patients by following the rectal cancer pathway developed and agreed with the Colorectal Pathway Group.

Figure 17.1: The 62-day pathway with timelines

<table>
<thead>
<tr>
<th>Time (Days)</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>GP referral</td>
</tr>
<tr>
<td>2 14/7</td>
<td>Direct access diagnostics</td>
</tr>
<tr>
<td>3 21/7</td>
<td>Staging tests (CT/CT/MRI)</td>
</tr>
<tr>
<td>4 28/7</td>
<td>MDM discussion</td>
</tr>
<tr>
<td>5 35/7</td>
<td>Outpatients</td>
</tr>
<tr>
<td>6 42/7</td>
<td>Treatment (surgery, neo-adjuvant, palliative)</td>
</tr>
<tr>
<td>7 62/7</td>
<td>Breach date</td>
</tr>
</tbody>
</table>

Unsuitable patients:
- unfit elderly
- patients with mobility issues
- patients taking anticoagulants
- performance status
18 Clinical Trials and Audit

It is a mandatory requirement for multidisciplinary teams (MDTs) to consider the suitability of all the patients discussed for an appropriate clinical trial.

- Patients should be offered entry into proposed clinical trial as agreed at the MDT after detailed discussion of the benefits versus drawbacks.
- Patients should be handed appropriate literature to aid their decision on whether to take part and given a contact number of the core member with responsibility for clinical trials.
- The research lead of each MDT will be invited to present a report on clinical trials recruitment and action plans to the pathway group at least annually in the presence of the chair, the pathway group research lead and research network nominated representative. A programme for improvement for clinical trial entry for the MDT should be agreed at the discussion.
- The pathway group will agree at least one audit project in which all member MDTs will take part.
- The pathway group will review the progress of the audit project annually and, once completed, discuss the results and agree an action plan.
- Data obtained from the National Bowel Cancer Audit Programme (NBOCAP) annual reports will be discussed at the pathway group and a compliance report with recommendations obtained from member MDTs.
19 Survivorship

As cancer treatments become more effective, more people are living with and beyond cancer with specific needs as a direct result of the cancer and its treatment. The consequences of treatment depend on multiple factors and affect each person differently.

Consequences may be physical (e.g. cardiovascular conditions, impact on fertility, bone health and gastrointestinal); emotional and psychological (e.g. anxiety, self-confidence and depression); social; spiritual; or cognitive. They can impact on every aspect of a person and on their family’s lives, from the ability to work, through to the ability to have a family or to participate in social activities. It is widely acknowledged that cancer survivors have a multitude of unmet needs following treatment, with a majority still having some needs 6 months later. Good survivorship care enables the person to live as full and active a life as possible.

The National Cancer Institute Dictionary of Cancer Terms says that survivorship:

“focuses on the health and life of a person with cancer post treatment until the end of life. It covers the physical, psychosocial, and economic issues of cancer, beyond the diagnosis and treatment phases. Survivorship includes issues related to the ability to get healthcare and follow-up treatment, late effects of treatment, second cancers, and quality of life. Family members, friends, and caregivers are also considered part of the survivorship experience.”


The National Cancer Survivorship Initiative (NCSI) vision document mandated five shifts in care for individuals completing cancer treatment. NCSI advocates cancer being treated as a chronic illness, with patients empowered and supported to take an active role in their care. Improving Outcomes: a Strategy for Cancer states that people living with and beyond a cancer diagnosis should have their full needs addressed to prevent long-term disability, enabling them to live a full, active, good-quality life for as long as possible. Work within the NCSI has to date focused on survivorship from the end of treatment, but its report, Living With and Beyond Cancer: Taking Action to Improve Outcomes acknowledges that survivorship care from the point of diagnosis is also vital. It challenges services to develop further and focuses on five different areas:

- Information and support from diagnosis
- Promoting recovery
- Sustaining recovery
- Managing consequences
- Supporting people with active and advanced disease.

The importance of good survivorship care is well known: those who have unmet needs are 20% more likely to visit their GP and twice as likely to attend A&E as age-matched healthy people. They are more likely to be unemployed and many report economic hardship. Much has been achieved both nationally and locally to address this agenda. It is essential that in the LCA our patients have access to high-quality, equitable survivorship services on a par with the best in the country. We will continue to build on the successes to date.
The Consequences of Cancer and its Treatment (CCaT) collaborative group (a Macmillan community of interest) produced a guidance document that includes ‘10 top tips’ for patients. These cover the key components of good survivorship care, and the LCA expects services to address these areas. The following points for professionals are based on the CCaT’s work.

19.1 Discuss a person’s needs

The holistic needs assessment (HNA) described in Appendix 14 has been shown to be effective in identifying a person’s areas of concern. It can take many forms and the LCA has developed its own tool, based on the concerns checklist and distress thermometer. The tool allows patients to specify what is of most concern to them, and so directs subsequent discussion and intervention to addressing these needs. It has scope to cover concerns that are physical, emotional, spiritual, financial, welfare and practical. It is anticipated that, as the HNA becomes embedded within the pathway, patients will start to ask for it and professionals will need to be able to respond to this.

**Recommendation:** every patient should be offered an HNA at key pathway points, including at diagnosis and end of treatment, and whenever a person requests one.

19.2 Provide a treatment summary and care plan

A treatment summary provides a summary of the cancer treatments received by the end of the first treatment, planned follow-ups (including mechanisms for these) and signs and symptoms of which to be aware. The aim is to provide information not only to the patient but also to the GP about possible consequences of cancer and its treatment, signs of recurrence and other important information.

A care plan is generated as a result of an HNA and is the agreed plan between the patient and healthcare professional about how the identified areas of concern will be addressed. This may cover provision of information (e.g. through an information prescription), onward referral for specialist assessment and intervention, or things that the patient themselves can do (e.g. contact their HR department about options for a graduated return to work).

**Recommendation:** an end-of-treatment consultation should be offered to every patient. This should include an end-of-treatment HNA and associated written care plan, and should also include the discussion and provision of a comprehensive treatment summary.

19.3 Provide a main contact

Several pieces of UK-wide work have shown the necessity of a key contact, or key worker, not least the national Cancer Patient Experience Survey. It is now agreed that both patients and GPs (and other healthcare professionals) benefit from having a named person to contact if they need help or advice about issues relating to the consequences of cancer and its treatment.

**Recommendation:** the treatment summary should include the details of a key worker in addition to details of who to contact out of hours. This should be sent to the GP, the patient and any others the patient identifies as necessary.
19.4 Identify post-treatment symptoms

As discussed above, cancer and its treatments can have far-reaching consequences and people with associated unmet needs are more likely to access healthcare services than their healthy counterparts. Providing information on likely post-treatment symptoms, and how these can be managed or avoided, allows people to seek the right help from the right people at the right time. Consequences of colorectal cancer should be explicitly discussed as encompassing alteration in:

- Sexual function – affecting at least 25% of men and women after rectal cancer treatment
- Urinary function – at least 25% report difficulties with micturition after rectal cancer surgery
- Bowel function – up to 90% experience a change in bowel habit after an anterior resection and at least 50% of these patients will have troublesome function at 3 months. For a subset of patients, particularly those who received pelvic radiotherapy, there may be persistent problems with function up to 5 years post-treatment
- Perceived body image – 25% report disliking their body and this is generally more likely if the person has a stoma. These feelings can persist for years after treatment
- Energy levels
- Mood

**Recommendation:** information on anticipated or possible consequences of cancer treatment, and what to do if they occur, should be routinely provided to all patients. This should be done from the time of discussion of treatment onwards, with the information clearly reiterated during the end-of-treatment consultation.

19.5 Provide support about day-to-day concerns

Patients’ lives change following a cancer diagnosis. It is recognised that people need help and support to find a ‘new normal’. This may cover any one of a multitude of aspects, from work and education, through to financial worries and needing help with caring responsibilities. Help should be offered at all key points in the pathway, but may be of particular relevance at the end of treatment and may well be highlighted in the HNA. There are various options for written information provision (e.g. Macmillan Cancer Support information leaflets and information prescriptions) as well as some specialist services (e.g. Citizens Advice). Reports published by the NCSI, available on the NCSI website, may be of use to professionals.

**Recommendation:** patients should be routinely asked whether they need support with day-to-day issues and referrals made to specialist services when necessary.

19.6 Enable patients to talk about how they feel

Having a cancer diagnosis has an emotional impact and people experience a wide range of emotions at the end of treatment. Sometimes, these can be dealt with by the person alone or with support from the key worker and others, but some people will need referral to psychological support services. This may be true for patients’ families and carers too.

**Recommendation:** use an HNA to identify emotional concerns. Further screening tools (e.g. the Hospital Anxiety and Depression Scale) should be considered, with subsequent referrals made as necessary.
19.7 Encourage a healthy lifestyle

There is a growing body of evidence that supports the adoption of a healthy lifestyle for those who have had a cancer diagnosis. Evidence suggests there is poor awareness of the link between colorectal cancer and lifestyle. Patients with colorectal adenomas perceive no connection between health behaviour and disease outcome. This may present a ‘teachable moment’ if risk factors can be linked at a personal level to current behaviours. There is a cumulative effect of healthy lifestyle behaviours/factors on the development of colorectal cancer. These are:

- Smoking
- Diet and alcohol intake
- Physical activity levels
- Waist circumference.

19.7.1 Smoking cessation

Tobacco smoking is the main cause of preventable morbidity and premature death in England. The end of treatment provides an opportunity to deliver stop-smoking interventions when an individual may be more susceptible to health advice and hence more motivated to quit.

**Recommendation:** all current smokers should be asked about their smoking habit and offered smoking cessation advice with onward referral to local services as necessary.

19.7.2 Diet and alcohol

The role that diet can play in cancer incidence has been widely documented. In colorectal cancer, 14% of cases could be prevented by avoiding excess weight and 34% through changes in diet and alcohol intake. Research has now moved to look at the influence of diet beyond treatment. The nutritional issues during or following treatment include weight loss or gain, changes in body composition (e.g. loss of muscle mass) and particular eating difficulties (e.g. swallowing and limited capacity for food). There are also long-term symptoms (e.g. changes in bowel habits for those who have had pelvic radiotherapy).

Receiving advice from an appropriately trained professional has been shown to improve quality of life, reduce risk of recurrence and risk of developing a new primary or other chronic disease, such as heart disease or diabetes.

**Recommendation:** at the end of treatment, patients should be provided with dietary advice based on the World Cancer Research Fund recommendations, with referral to specialist dietitians as required.

19.7.3 Physical activity

There has been a dramatic rise in the amount of high-quality published research on the role of exercise in cancer in recent years, with some evidence suggesting that exercise after colorectal cancer diagnosis improves survival and reduces recurrence. It is thought that the protective effects of exercise in colorectal cancer are a result of reduced transit time, changes in prostaglandin ratios and inflammatory and immune responses. Several randomised control trials looking at exercise and colorectal cancer have shown significant improvements in quality of life and cardiovascular fitness, both during and after treatment.
There is wide consensus that cancer survivors should exercise to the same level as the general population for health benefits. Research suggests that a combination of cardiovascular and muscular strength training has additional benefits over undertaking only one type of exercise.

**Recommendations:** patients should be encouraged to maintain or increase their level of physical activity both during and after treatment in line with national guidance. They should be referred for specialist assessment by a physiotherapist as necessary.

Patients should also be offered access to a health promotion event, such as a health and wellbeing clinic, at the end of treatment.

### 19.7.4 Waist circumference

Both general and abdominal obesity measures are significantly associated with risk of mortality (not cancer specific).

Body mass index (BMI) and waist circumference show comparable positive associations with colon cancer in men. Associations between anthropometric measures and colon cancer are weak or null in women.²

There is some research indicating that there is a moderate but consistently reported association between general obesity (as determined by BMI) and colorectal cancer incidence and mortality and that waist circumference may be associated with increased colorectal cancer incidence, possibly partially independent of BMI.³

### 19.8 Enable self-managed follow-up

There is a move towards increased self-management and follow-up closer to home. This has clear benefits to patients, including reduced anxiety in the lead-up to routine appointments and less interference in their day-to-day life caused by travelling to hospitals. In addition, research has shown that recurrence is more likely to be detected by the patient themselves between appointments rather than at the outpatient appointment. By reducing unnecessary appointments, Trusts are able to see new patients more quickly and spend more time with more complex patients.

For self-management to be effective, patients need to be given the right information about the signs and symptoms of recurrence and clear pathways to follow if they have concerns. They should also be guaranteed a fast, explicit route to re-access services if necessary.

**Recommendation:** in addition to the use of treatment summaries (as described above), services should work collaboratively with the LCA stratified pathways project to implement patient-led follow-up.

### 19.9 Encourage survivors to share their experience

Sharing the experience of living with and beyond cancer can be beneficial to patients, their carers and others who have a cancer experience. Providing feedback on their experience, and volunteering for and participating in research can all have a positive impact on the patient.

**Recommendation:** patients should be offered information on local support groups and how to share their experiences.
Department of Health (2013) *Living With and Beyond Cancer: Taking Action to Improve Outcomes*


20 Specialist Palliative Care

20.1 Key stages for consideration of specialist palliative care needs

There are key points in a patient’s illness when their palliative care needs should be specifically considered. These key points include:

- Pre-diagnosis if advanced disease is suspected
- At diagnosis
- At commencement of definitive treatment of the disease
- On completion of the primary treatment plan
- On disease recurrence or relapse
- At the point of recognition of incurability
- At end of life
- At other times requested by a patient.

Depending on the severity or complexity of symptoms, this may prompt referral to the relevant multiprofessional specialist palliative care (SPC) services.

Within the London Cancer Alliance (LCA), SPC teams offer a consultative service for all patients, based on physical, psychological, social, emotional or spiritual symptoms or needs, irrespective of diagnosis.

Services are available within Trusts, hospices, and community settings.

20.2 Referral

Guidance from the LCA Palliative Care Group suggests that referral to SPC services is appropriate where:

- The patient has active, progressive advanced disease, a limited prognosis, and the focus of care is on quality of life. For example:
  - Potentially fatal conditions where treatment has changed from curative to palliative intent, e.g. cancer, multiple co-morbidities where curative treatment is no longer possible
  - Complex symptom control issues during treatment
  - Treatment is available to prolong life but prognosis is uncertain, e.g. advanced chronic obstructive pulmonary disease, advanced heart failure
  - Palliative treatment from the outset with no cure available, e.g. motor neurone disease, multiple systems atrophy, advanced dementia
- The patient has unresolved complex needs that cannot be met by the team responsible for their care. These needs may be physical, psychological, social and/or spiritual. Examples may include complicated symptoms, difficult family situations, or ethical issues regarding treatment decisions
- The patient gives consent for referral (where the patient has capacity for this consent).

If in any doubt, please contact the SPC team available in all LCA Trusts. See Appendix 16 for a copy of the SPC form.
Referral can be made by an appropriate healthcare professional in contact with the patient. All patients should have contact with a specialist nurse (usually their key worker) from referral into secondary care. SPC input should be available, when required, both at the MDT meetings and at the initial consultation. Patients who may benefit from SPC services should be identified, the referral discussed with the patient and carers and then referral made as soon as possible.

The SPC team within each Trust is available for advice about symptom management. It is also important to consider whether, if it has not been done already, referral should be made to the relevant community SPC service for ongoing support of the patient at home, following diagnosis in the outpatient department or hospital discharge. Again, the hospital SPC team can advise.

20.3 Management

LCA specialist palliative care teams have adopted the nationally available Palliative Care Adult Network Guidelines available at: [http://book.pallcare.info/](http://book.pallcare.info/)
Appendix 1: Urgent Suspected Colorectal and Anal Cancer Referral Forms

Model 2 WW Referral Form (Colorectal)

<table>
<thead>
<tr>
<th>Hospital to which patient is being referred:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of referral:</td>
</tr>
<tr>
<td>Has the patient previously visited this hospital? Y / N</td>
</tr>
</tbody>
</table>

**Patient details**

<table>
<thead>
<tr>
<th>Title:</th>
<th>Dr:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surname:</td>
<td>Address:</td>
</tr>
<tr>
<td>First Name:</td>
<td>Postcode:</td>
</tr>
<tr>
<td>Date of birth:</td>
<td>NHS number:</td>
</tr>
<tr>
<td>Address:</td>
<td>E-mail:</td>
</tr>
<tr>
<td>Postcode:</td>
<td>Practice code:</td>
</tr>
<tr>
<td>Home Tel:</td>
<td>Mobile:</td>
</tr>
<tr>
<td>Transport required: Y / N</td>
<td>First language:</td>
</tr>
<tr>
<td>Interpreter required? Y / N</td>
<td>Language:</td>
</tr>
</tbody>
</table>

**Have you informed the patient that you suspect colorectal cancer?** Y / N

**Have you given the patient the 2WW information leaflet?** Y / N

**Have you told the patient they will be seen within 2 weeks?** Y / N

**Has the patient had a previous diagnosis of cancer?** Y / N (If yes, please specify if known)

**Abdominal examination performed** Y / N

<table>
<thead>
<tr>
<th>FBC</th>
<th>Y / N</th>
</tr>
</thead>
<tbody>
<tr>
<td>P R examination performed</td>
<td>Y / N</td>
</tr>
</tbody>
</table>

**Symptoms and clinical findings**

- Rectal bleeding **WITH** a change in bowel habit to looser stools and/or increased frequency **for six weeks or more**
  - > 40 years
- A definite palpable right-sided abdominal mass
  - All ages
- A definite palpable rectal (not pelvic) mass
  - All ages
- Rectal bleeding **persistently WITHOUT** anal symptoms*
  - > 60 years
- Change in bowel habit to looser stools and/or increased frequency,
  - **WITHOUT** rectal bleeding and for six weeks
  - > 60 years
- Iron deficiency anaemia **WITHOUT** an obvious cause (Hb <11g/dl in men or <10g/dl in postmenopausal women)
  - All ages

**Patient mobility**

**Performance status**

**Taking warfarin/abnormal clotting**

**Diabetes**

**Heart/chest problems**

**Renal function**

**Patient previously investigated for abdominal or bowel problems?** Y / N

If yes:

**Consultant name:**

**Date:**

**Findings:**

Other information relevant to this referral (e.g. past history, family history, specific anxiety, relevant medications etc.):
Appendix 2: Management of Early Rectal Cancer

- Patients will typically present with a primary diagnosis of rectal carcinoma or may be found to have invasive carcinoma within a pre-operatively diagnosed benign rectal polyp following excision.
- Patients will present with typical symptoms of a rectal tumour such as rectal bleeding, tenesmus, urgency and change in bowel habit.
- Patients will be diagnosed on clinical examination and biopsy following rigid sigmoidoscopy in the clinic. Some patients may require examination under anaesthetic if they are not able to tolerate this.
- Patients will require full colonoscopy to assess for synchronous colorectal tumours.
- The primary tumour should be fully staged using contrast-enhanced magnetic resonance imaging (MRI) as specified in Chapter 4 on imaging. A CT of the chest, abdomen and pelvis should be performed to exclude metastatic disease.
- Suitable tumours are those with favourable prognosis and a low risk of recurrence; tumours staged pre-operatively as T1 SM1 (Kikuchi classification) well-differentiated adenocarcinomas, measuring <3cm in diameter and with no lympho-vascular invasion.
- If clinical examination (consider EUA) and the MRI confirm that the patient may have an early rectal cancer (ERC) with the above criteria, they may be considered for local surgical treatments with an intention of cure rather than radical resection.
- Where patients are being considered for local excision, an endoanal ultrasound may be performed where facilities exist because of its greater accuracy in T staging in experienced hands. In some London Cancer Alliance (LCA) units, MRI scans have an equivalent accuracy.
- All patients deemed suitable for local excision should be referred for discussion at a designated ERC multidisciplinary team (MDT) that meets specialised commissioning criteria for ERC.
- In the LCA, there are four approaches to local excision of early rectal cancers:
  - Parks transanal rectal excision (TAR)
  - Transanal endoscopic microsurgery (TEMS)
  - Endoscopic mucosal dissection (EMD)
  - Endoscopic submucosal dissection (ESD).
- Surgical management: low tumours (within 6cm of the anal verge) may be suitable for TAR. Higher tumours up to 20cm from the anal verge are more amenable to TEMS or ESD.
- Salvage surgery: salvage radical excision in the form of anterior resection or abdomino-perineal resection is offered to patients whose tumours are staged as above T1 SM1 or if the resection is R1/R2.
- Some benign rectal polyps that are treated by local excision are found subsequently to have invasive components. These could be managed as above, depending on the T stage.
- Follow-up is as per local guidelines for each MDT.
- Cancer waiting time targets should be adhered to and monitored.
The pathological handling of TEMS specimens

- The histology of any pre-operative biopsies must be reviewed.
- The specimen should be pinned out on a cork board by the surgeon (and ideally it should be orientated).
- The specimen should be photographed (with a scale).
- The whole specimen should be blocked.
- The site from which the blocks were taken should be marked on a diagram (or photograph).
- Cut-downs must be obtained, where necessary, to ensure that the mucosal and deep resection margins are properly visualised.
- The report should include:
  - The nature and degree of dysplasia of the polyp and/or the nature and degree of differentiation of the tumour
  - The minimum distance of the adenoma and/or carcinoma from the mucosal resection margin, which must be measured
  - The depth of invasion (T stage) of any carcinoma as per Kikuchi classification and categorised into SM1, SM2 or SM3. The distance beyond the muscularis mucosa should also be measured
  - The distance from the deep resection margin, which must be measured
  - In the case of carcinomas, the presence of vascular or lymphatic invasion and the involvement of any lymph nodes included in the specimen, which must be recorded.
Figure A2.1: Assessment protocol for early rectal cancer

Indications for TEMS
- Benign rectal tumours
- Rectal cancer
  - Cure: T1 SM1, well-differentiated, <3cm with no lymphovascular invasion on MRI/EAUS
  - Big biopsy: T1 <3cm lesions which cannot accurately sub-stage as per Kikuchi classification
  - Compromise: any stage but patient is unfit for major surgery
  - Palliation: locally advanced and symptomatic
  - Patient choice.

Should not be considered as standard therapy for management of rectal cancers

Discuss at local colorectal cancer MDT
Suitable for TEMS

Refer to ERC MDT
Include:
- All staging investigations, including CT/MRI
- Histology, including original blocks
- Endoanal US if performed locally or by tertiary centre.

Unsuitable
Return to referring MDT for radical resection

Suitable
- Suitable for TEMS – treat by ERC MDT
- Suitable for TART – treat by ERC MDT or referring MDT

Post-op results
Radical salvage surgery
Adjuvant radiotherapy/chemotherapy
Follow-up – local or tertiary centre as per standard protocols

Standard CRC protocols
Appendix 3: Management of Colorectal Cancer Emergencies

This relates to Chapter 9.

A high proportion of colorectal cancer patients present as an emergency (aggregate of 27% in the London Cancer Alliance 2008–10). In the 2013 Association of Coloproctology of Great Britain and Ireland (ACPGBI) National Bowel Cancer Audit Programme, emergency cases represented 21% of all submitted cases. Understanding why so many patients present as an emergency, despite the wide introduction of screening, should be a priority. Reducing emergency presentation will make a large impact on colorectal cancer mortality.

The purpose of this appendix is to state the management pathway and policy for patients presenting to Trusts as an emergency with bowel cancer.

Evidence-based management

When bowel cancer presents as an emergency, it is associated with a higher operative mortality. The unadjusted mortality in malignant bowel obstruction is four times higher than for elective surgery. The most common presentation mode for emergency bowel cancer patients is obstruction.

In the absence of perforation or life-threatening bleeding (very rare), operation for large bowel obstruction can be regarded as urgent rather than emergency. The patient should be appropriately stabilised and operated on during the day, using experienced surgeons and anaesthetists. The only exception to this rule is where the ileocaecal valve is competent and the caecum is in danger of perforation.

Management should follow the guidelines below:

- Adequate fluid resuscitation with crystalloids (Hartmann’s solution, not normal saline)
- Large bore intravenous cannulae
- Urinary catheterisation
- Hourly fluid balance charts recorded accurately and checked every few hours to ensure that fluid balance is adequate
- Monitoring of temperature, pulse, blood pressure and respiratory rate on an hourly basis
- An arterial blood gas with lactate assessment is a useful guide to the severity of illness
- Start intravenous cefuroxime and metronidazole and give high-dose clexane and TED stockings
- Arrange a computed tomography (CT) scan to be done out of hours if required, especially if there is concern regarding a perforation, which can be missed on a plain abdominal x-ray
- Arrange an anaesthetic opinion that night and inform the HDU and the critical care outreach team.

Who should operate on emergencies?

- This type of patient has a high mortality rate and should therefore be operated on either by a consultant surgeon or a very experienced colorectal SpR (specialist registrar)
- All consultant surgeons should operate on colonic cancer emergencies that cannot be stabilised for surgery the following day.
- Rectal cancer emergencies are to be transferred to the care of a consultant colorectal surgeon.
In the case of rectal cancers, if the patient is not a true emergency/urgent case, they should be transferred to a colorectal surgeon.

Colonic malignancies may stay under the care of other non-colorectal surgeons but the patient must be discussed at the colorectal MDT and a senior member of that team (consultant or SpR) is to attend the meeting each time the patient is discussed. This is an essential step in the management of the patient and is not to be omitted under any circumstances.

For the purpose of true emergencies the following is offered as a guide:

- **Right-sided lesions**
  - Obstruction without perforation: a right hemicolecctomy with primary ileocolonic anastomosis in certain circumstances.
  - Obstruction with perforation and acute peritonitis: a right hemicolecctomy with end ileostomy and a mucous fistula. In experienced hands and with minimal contamination, a primary anastomosis can be performed with or without a defunctioning stoma.

- **Left-sided lesions**
  - A defunctioning stoma alone is inappropriate in all but extreme circumstances. The favoured option is to resect the cancer and bring out an end colostomy as a Hartmann’s procedure (in the case of obstruction and perforation with faecal peritonitis). Or, if conditions and skill are favourable (obstruction only), a primary anastomosis is performed, usually with on-table lavage.
  - Consideration should be given to a de-functioning ileostomy in this case. The alternative approach to consider is colonic stenting as a bridge to elective surgery. Also, especially in the case of a competent ileocaecal valve when the caecum is not thought to be viable or in danger of later necrosis, a subtotal colectomy with ileorectal anastomosis should be performed.
Appendix 4: Colorectal Stenting Service

This appendix relates to surgical treatment for emergency presentations.

Self-expanding colonic metal stents (SEMS) are wire mesh tubes placed into strictures in the gastrointestinal tract lumen in order to maintain patency and prevent obstruction. They are usually placed under endoscopic control with fluoroscopy but can be placed radiologically depending on local skills and service provision.

A stent can be placed in any lumen that is endoscopically or radiologically accessible.

**Referral mechanism**

Internal referrals: patients being considered for stenting should be discussed with a consultant gastroenterologist and/or radiologist.

External referrals: outside Trust referrals are taken from surgeon to surgeon. The accepting surgeon decides if the decision to stent is appropriate and refers the patient to the endoscopy department for stenting. As it is rarely possible to wait until the next multidisciplinary team meeting, the case should be discussed with another core member.

**Indications for stenting**

- Palliation of a colonic carcinoma causing obstructive symptoms
- Emergency treatment of malignant colonic obstruction to avoid immediate surgical intervention if not appropriate.

**Contraindications**

- Placement of a permanent stent in a patient planned for curative therapy
- Significant co-morbidity conferring a high risk to carrying out the procedure
- The life expectancy of the patient is less than seven days
- Presence of additional areas of bowel structuring
- The lower limit of the lesion is within 3cm of the dentate line.

**Prerequisites for stent insertion**

- Histological confirmation of malignancy or, in the acute setting, radiological evidence suggestive of a malignant process
- Radiological evidence of a large bowel obstruction.

**Procedure overview**

All procedures should be carried out by, or under the direct supervision of, an appropriately experienced consultant, with at least two appropriately trained assistants. Cardiopulmonary resuscitation equipment must be available within the department. Management of fluoroscopic equipment must be carried out by appropriately trained radiographers.

The procedure is usually carried out under combined endoscopic and fluoroscopic control. The patient is sedated (conscious sedation using a combination of an opiate and benzodiazepine). A standard colonoscopy is performed and the stricture identified.
The stent may be placed using a ‘through-the-scope’ device in the colon.

**Pre-procedure preparation**

- A coagulation screen within 48 hours of the procedure.
- Assessment of the patient’s ability to provide consent should be made and alternative consent secured as per the Trust Consent Policy.
- Intravenous access should be secured.
- All oral/enteral feeding should be stopped 8 hours prior to the procedure.
- 2 x phosphate enemas should be administered 1 hour before the procedure.

**Post-procedure care**

Specific instructions will depend on the procedure carried out. All patients should remain in hospital until effective palliation is confirmed.

Dietary restrictions: a low-residue (low-fibre) diet can be commenced the following day.

**Risks and complications**

- 1% procedure-related mortality
- 20–30% stent migration
- <1% perforation.

Procedure-related complications (mainly perforation) are more common if a dilatation is carried out prior to placement of the stent.

**Colorectal stenting – out-of-hours provision**

Patients may sometimes require emergency stenting out of normal working hours, in particular at weekends. Not all Trusts will be able to offer such services. Referrals can be made by contacting the on-call surgical registrar at the appropriate Trust.

The patient will be transferred under the care of the colorectal surgeon at the receiving hospital in preparation for stenting by the gastroenterologist and/or radiologist. After successful stenting, the patient may be transferred back to the referring hospital for their further care or continue at the receiving hospital if the patient wishes.
Appendix 5: Colorectal Liver Metastases Referral, Treatment and Follow-up Guidelines

There has been increasing recognition of the potential benefits of liver resection for colorectal metastases in the UK. There are no randomised studies assessing outcome following resection compared with no treatment or other therapeutic modalities in patients with known resectable liver metastases as it is generally considered unethical not to offer surgery for resectable disease.

There has been increased interest in more aggressive chemotherapy regimens that have been reported not only to control metastatic disease but also to render some advanced liver metastases resectable. Furthermore, other new modalities have become available that allow safe ablation of liver metastases without the need for surgical intervention.

The guidelines in this appendix were written in accordance with the LCA Colorectal Pathway Group. The guidelines should not necessarily be regarded as the standard of care for all patients. Individual cases must be managed on the basis of all clinical data available for that case. The guidelines are subject to change in light of future advances in scientific knowledge.

These guidelines are based on those published on the British Society of Gastroenterology website.

**Referral process**

- **Before referral:** Referring diagnostic teams may further investigate a patient after the diagnosis of malignancy and before referral to the specialist team (e.g. PTC drainage) in line with the specific process agreed with each individual unit. It is expected that each colorectal multidisciplinary team (MDT) will have a designated liver surgeon as a core/extended member.

- **Referrals:** Patients who need specialist care are referred to the designated hepatobiliary (HPB) unit from the referring diagnostic and diagnostic/local care teams. The referring unit completes the agreed referral form (or referral letter) and sends this to the designated HPB unit office, along with details of relevant investigations such as imaging.

- **Patients accepted:** The designated liver MDT accepts all patients with liver and acute HPB conditions.

**MDT discussion**

- The core liver surgeon will be informed of any patients with liver metastases that are to be discussed prior to the MDT meeting to ensure availability. All staging investigations should be performed prior to discussion at the MDT meeting. Feedback: an MDT outcome form is completed and sent to the referring unit and the patient’s GP within 24 hours of the MDT.

- **Care:** Where appropriate, patients can be referred back to their referring hospital for local care, in line with the specific process agreed with each individual unit.

**Presentation and diagnosis**

**Clinical features**

These symptoms may be caused by swelling of the liver. These and other symptoms may be caused by adult primary liver cancer or by other conditions. A doctor should be consulted if any of the following problems occur:

- A hard lump on the right side just below the rib cage
• Discomfort in the upper abdomen on the right side
• Pain around the right shoulder blade
• Unexplained weight loss
• Jaundice (yellowing of the skin and whites of the eyes)
• Unusual tiredness
• Nausea
• Loss of appetite.

The vast majority of colorectal liver metastases will be picked up via the patient’s follow-up for their colorectal primary tumour. Robust protocols should be in place to ensure that patients identified in this way are referred to the appropriate specialist MDT for discussion of treatment options.

**Blood tests**

A baseline measurement of carcinoembryonic antigen (CEA) should be performed. Liver function tests often show an obstructive picture with:

• Raised alkaline phosphatase
• Raised bilirubin
• Raised gamma glutamyl transpeptidase.

However, aminotransferases are frequently relatively normal but may be markedly raised in acute obstruction or cholangitis:

• Prolonged obstruction of the common bile can cause a reduction in fat-soluble vitamins (A, D, E and K) and increase prothrombin time.
• With advanced disease, systemic non-specific markers of malignancy may be altered – e.g. reduced albumin, haemoglobin and lactate dehydrogenase (LDH).

**Imaging**

Patients with suspected CLM should have a CT scan of the abdomen and pelvis performed with intravenous contrast and ideally a maximum collimation of 5mm. The local diagnostic unit should perform a CT on the patient prior to referral for management by the specialist MDT.

It is vital that the patient’s imaging is included when they are initially referred to the centre MDT for collaborative management of their hepatic metastatic disease. Ideally, their scans to date should be forwarded with the referral. Contrast-enhanced CT of the chest, abdomen and pelvis remains the ‘gold standard’ in imaging patients with CLM and patients should be referred when this CT has been obtained.

Subsequent imaging may not be required, but if it is then the following will be considered:

• Ultrasound
• Magnetic resonance imaging (MRI)
• Positron emission tomography (PET) scan
• Imaging-guided biopsy (CT or USS)
• Portal vein embolisation (for liver volume modulation prior to resection).
At the time of treatment for CLM, the latest axial staging imaging must not be more than 6 weeks old. Further axial imaging in the form of MRI will normally be used after review of the initial CT at the centre HPB MDM in cases where diagnosis is uncertain or additional information is required prior to planning surgery (i.e. vascular and/or biliary anatomy considerations).

The role of PET scanning is under evaluation worldwide and definitive results are awaited. Its use for patients evaluated at the centre HPB MDM is for discussion on a case-by-case basis. It would usually only be indicated in the setting of excluding the presence of extra-hepatic disease when liver resection is planned in the presence of unfavourable history – that is, ruptured primary, or primary tumour histology, such as pT4 and/or N2, or where there is suspicion of pulmonary spread.

Other investigative measures such as EUS, image-guided biopsy and laparoscopic biopsy can also be used when there are specific clinical needs. Intra-luminal staging remains within the spectrum of responsibilities of the colorectal team treating or who have treated the primary tumour.

Furthermore, certain therapeutic interventional radiology procedures relevant to colorectal liver metastatic disease are offered at Hammersmith and King’s College Hospitals, including radiofrequency ablation (RFA) and selective internal radiation therapy (SIRT). The latter is subject to PCT funding.

**Histopathology**

The histopathology report of the resected liver specimen must include specific details that can be used to determine prognosis, including:

- The number, size and location of metastases
- Resection margin clearance from the tumour
- Capsular invasion
- Degree of differentiation
- Presence of necrosis
- Vascular and lymphatic invasion
- Lymph node status if sampled.
### Dataset for histopathology reporting of liver resection specimens (including gall bladder) and liver biopsies for primary and metastatic carcinoma (2nd edition)¹

**Reporting proforma for liver resection: colorectal cancer metastasis**

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</tr>
<tr>
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<td>……………………………………</td>
</tr>
<tr>
<td>Surgeon:</td>
<td>……………………………………</td>
</tr>
</tbody>
</table>

**Gross description**

- Number of liver specimens received: ……..
- Type of specimen:  
  - Segmental resection ❑  
  - Non-anatomic (wedge) resection ❑  
  - List segments: ………………………………………. 
  - Site/segment(s) of origin: ……………………….
- Specimen weight (all specimens combined): ………g
- For segmental resections, specimen dimensions (largest specimen):
  - antero-posterior ………mm, medio-lateral ………mm, supero-inferior ………mm
- Number of tumours present: ……. ……. Satellite lesions present: Yes ❑  
  No ❑  
- List maximum diameters for up to four largest tumours: ………mm, ………mm, ………mm, ………mm
- Distance from hepatic resection margin of nearest tumour: …………..mm
- Liver capsule intact and smooth:  
  - Yes ❑  
  - No ❑  
- Invasion of adherent adjacent tissue:  
  - Yes ❑  
  - No ❑  
- Lymph nodes(s) received:  
  - Yes ❑  
  - No ❑  

**Histology**

- **Tumour grade/differentiation:**  
  - Well/moderately differentiated: ❑  
  - Poorly differentiated: ❑  
- For tumour closest to margin: tumour cells present at margin:  
  - Yes ❑  
  - No ❑  
- If margin is clear: is clearance >10mm:  
  - Yes ❑  
  - No ❑  
  - If no: minimum distance to margin ………………..mm
- Microscopic vascular invasion identified:  
  - Yes ❑  
  - No ❑  
- Neo-adjuvant therapy given:  
  - Yes ❑  
  - No ❑  
  - Not known ❑  
- Response to neo-adjuvant therapy:  
  - Yes ❑  
  - No ❑  
- If yes: No residual tumour cells/mucus lakes only ❑  
  - Minimal residual tumour ❑  
  - No marked regression ❑  
- Number of lymph nodes examined: ………….. Number with metastases: …………..

**Background liver**

- Normal ❑  
- Steatosis ❑  
- Chronic liver disease with fibrosis ❑  
- Other: ………………………

**Comments/additional information**

---

**Signature of pathologist** ………………………………………………………………………………….  
**Date** ………./……../……..  
**SNOMED codes**  
**pT** …….  
**M** …..
Treatment options

Figure A5.1: Pathway for management of synchronous liver metastasis from colorectal cancer

Colorectal cancer with synchronous liver metastases

Referral to joint colorectal cancer and liver MDT

Systemic chemotherapy +/- radiotherapy for rectal cancer

Complete or partial response, resectable liver metastases

Stable disease, resectable liver metastases

Progressive disease or unresectable liver metastases

Joint colorectal cancer and liver MDT

Colorectal resection first

Liver resection first

Palliative treatment or other treatment modalities

+/- Post-resection systemic chemotherapy

Source: www.imperial.ac.uk/AP/faces/pages/read/Publications.jsp?person=L.jiao&_adf.ctrl-state=g2jxg5gmn_387
Figure A5.2: Pathway for management of liver metastasis from resected colorectal cancer

Source: www.imperial.ac.uk/AP/faces/pages/read/Publications.jsp?person=l.jiao&_adf.ctrl-state=g2jxg5gm_387

**Surgery**

Liver metastatectomies are performed at LCA liver centres at Hammersmith, Royal Marsden and King’s College Hospitals where all core members of the liver MDT are in place. All liver metastatectomies are performed at these three sites within the LCA.

Surgery is the only curative treatment for patients with liver carcinoma. Surgery cures only a minority of patients with liver carcinoma.

**Liver resection for colorectal metastases**

- The aim of liver resection (resectability) is to remove all macroscopic disease with clear (negative) margins and leave sufficient functioning liver.
- Patients with solitary, multiple and bilobar disease who have had radical treatment of the primary colorectal cancer are candidates for liver resection.
- The ability to achieve clear margins (R0 resection) should be determined by the radiologist and surgeon in the regional HPB unit.
- The surgeon should define the acceptable residual functioning volume, approximately one third of the standard liver volume, or the equivalent of a minimum of two segments.
- The liver surgeon and anaesthetist should take the clinical decision regarding fitness for surgery. If deemed medically unfit for surgery, patients should be considered for ablative therapy.
Patients with extrahepatic disease who should be considered for liver resection include those with:
- Resectable/ablatable pulmonary metastases
- Resectable/ablatable isolated extrahepatic sites – e.g. spleen, adrenal or resectable local recurrence
- Local direct extension of liver metastases, e.g. to diaphragm/adrenal that can be resected.

Normal contraindications to liver resection would include uncontrollable extrahepatic disease such as:
- Non-treatable primary tumour
- Widespread pulmonary disease
- Loco-regional recurrence
- Peritoneal disease
- Extensive nodal disease, such as retroperitoneal, mediastinal or portal nodes
- Bone or CNS metastases.

**Tumours borderline for resection**

Patients with tumours thought to be borderline for resection may have resectable or ablatable disease and should be referred for discussion with the regional HPB unit before chemotherapy. Resectability may be increased via the following:

- **Portal vein embolisation (PVE):** when, on CT volumetric studies, the expected remnant functional liver mass after the proposed hepatectomy would be marginal, or inadequate, percutaneous right portal vein embolisation should be explored. This is a mode to induce compensatory hypertrophy of the unaffected part of the liver, thus facilitating an extended right hepatectomy. If a satisfactory response is achieved, resection is scheduled no later than 6–8 weeks after the PVE.

- **Two-stage hepatectomy:** for patients with bilobar multinodular disease, when complete removal of all tumours is thought not possible with a single procedure, a two-stage approach can be adopted by first resecting the most tumour-laden lobe. Allowing for a period of 6 weeks for regeneration of the remnant liver, resection is then completed with removal of part of the remaining liver lobe. This approach can be combined with PVE prior to the first stage and/or RFA of the remnant tumours at either stage.

- **Laparoscopic liver resection:** in recent years there has been a very dynamic expansion in the application of laparoscopic techniques in HPB surgery. There is now enough data to support its role in the treatment of patients with CLM. Although almost any type of liver resection can be performed laparoscopically, there is no wider consensus for a blanket application of the method, owing predominantly to the lack of long-term survival data.

Every patient with CLM who requires resection of up to two liver segments in anatomically favourable sites should be considered for laparoscopic liver resection. It is envisaged that, as experience and data accumulate, the spectrum of this mode will increase.
Ablative therapy

- The decision to offer ablative therapy to patients with hepatic metastases should be made by the regional HPB unit.
- Patients who are not candidates for resection should be considered for the CLOCC (chemotherapy + local ablation versus chemotherapy) trial.²
- Entry into the CLOCC trial should be considered for patients with nine or fewer metastases (up to 4cm) without extrahepatic disease (EORTC 40004).
- Patients who are not suitable for entry to the CLOCC trial may be considered for ablative therapy.

Patients not suitable for resection or ablative therapy

Patients with advanced disease unsuitable for liver resection or ablative therapy should be referred to the clinical or medical oncologist with a special interest in colorectal cancer for further management and supportive care.

Synchronous metastases

- Normally, colorectal cancer resection and liver resection would not be performed synchronously. However, management of accessible small metastases detected pre-operatively should be discussed with the local liver centre for consideration of combined resection.
- Lesions discovered at operation should not be biopsied.
- Excision of small atypical lesions should not be considered without discussion with the regional HPB unit.
- Patients should be referred for consideration of liver resection after recovery from primary surgery.
- Patients with potentially resectable liver disease and who have undergone radical resection of the primary tumour should be considered for liver resection before consideration of chemotherapy.
- Patients with unfavourable primary pathology, such as perforated primary tumour or extensive nodal involvement, should be considered for adjuvant chemotherapy prior to liver resection and be restaged at 3 months.

Biliary decompression and stents

Biliary obstruction rarely happens in patients with colorectal liver metastases except in cases of very advanced disease with a large volume of liver disease. These patients will usually be considered for palliative care.

Chemotherapy

Enrolment of patients in clinical trials is encouraged where possible

In all cases of metastatic colorectal cancer, molecular analysis to determine the presence of mutations in KRAS, NRAS and where possible BRaf should be performed as soon as the diagnosis is made and treatment is being considered.

There is growing interest in the role of biopsy of metachronous metastatic disease as the molecular profile of metastases may differ from that of the primary tumour.
Stage IV: operable or potentially operable metastatic disease

- All patients with liver metastases should be discussed at the liver MDT at the outset and a treatment sequence and plan agreed.
- The optimal sequencing of surgery and chemotherapy is unknown. No trials have been performed directly comparing peri-operative chemotherapy with adjuvant treatment. The optimal approach should be decided by an MDT on an individual case basis.
- In the case of synchronous metastatic disease with an in-situ non-obstructing primary, there is no evidence to dictate the optimal sequencing of resection of the primary, metastectomy and delivery of chemotherapy. This should be decided by the MDT on an individual case basis.
- Neo-adjuvant chemotherapy increases the risk of chemotherapy-induced hepatotoxicity (which can impact on surgical morbidity). This must be considered when determining the sequencing of hepatic surgery and peri-operative chemotherapy. The optimal maximum duration currently recommended is 3 months. This may be longer if the tumours are being down-staged but should be discussed with the liver MDT. It is unlikely that beyond 5 months of neo-adjuvant chemotherapy there will be incremental benefit at the expense of further hepatotoxicity.
- FOLFOX/FOLFIRI are acceptable neo-adjuvant regimens based on patient preference, co-morbidities and treatment toxicity profile.
- There is evidence that FOLFIRI is not beneficial as an adjuvant therapy post-liver resection.
- There is no conclusive evidence to support the addition of biological therapy to chemotherapy in the peri-operative/adjuvant post-metastectomy setting. Triplets may result in higher response rates but this may not be correlated with improved survival.

Stage IV: inoperable metastatic disease

Patients with inoperable metastatic disease can be subdivided into two groups:

- Borderline resectable – this is defined on an individual patient-by-patient basis by the relevant MDM
- Palliative.

Broadly, the options for chemotherapy are the same in these two groups and this will be one of the factors influencing choice of regimen. In the former, the goal is a high response rate to maximise the prospect of sufficient down-sizing to permit resection. Consequently, such patients will routinely be offered doublet (or triplet) chemotherapy. There is uncertainty about the role of cetuximab in this population pursuant to the results of the New EPOC study\(^3\) (final analysis with mutation profiles pending). Certainly, cetuximab should only be used in combination with FOLFIRI in this setting.

There is no phase III data on the benefits of bevacizumab in addition to chemotherapy for patients with borderline resectable disease. However, some Phase II studies (BOXER\(^4\), OLIVIA\(^5\)) have indicated high response rates with encouraging long-term outcomes for patients managed peri-operatively with bevacizumab-containing chemotherapy regimens. Conversely, the GONO (Gruppo Oncologico Nord Ovest) trials of triplets did not demonstrate an increase in rates of R0 resection. The optimal duration of chemotherapy prior to resection is not known. It is recommended that re-evaluation imaging is performed at least every 3 months. Patients who have become resectable could either proceed to surgery or complete chemotherapy (usually for a total of 6 months) before resection.

Details of the regimens used can be found in Chapter 12.
RAS testing is available from:

<table>
<thead>
<tr>
<th>Imperial College Healthcare NHS Trust</th>
<th>The Royal Marsden NHS Foundation Trust</th>
<th>VIAPATH Guy’s and St Thomas’ NHS Foundation Trust</th>
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</thead>
</table>
| Centre for Pathology
Imperial College
Department of Cellular Pathology
4th Floor, Clarence Wing
St. Mary’s Hospital
LONDON
W2 1NY | Molecular Diagnostics
The Centre for Molecular Pathology
Royal Marsden NHS Foundation Trust
15 Cotswold Road
SUTTON
SM2 5NG | Molecular Oncology Unit
Guy’s Hospital
Great Maze Pond
LONDON
SE1 9RT |

**Stereotactic body radiotherapy**

Currently, the evidence for stereotactic body radiotherapy (SBRT) for liver metastases is predominantly retrospective case series with some prospective Phase I and II trials. Within the studies there is significant heterogeneity in patient selection, size and number of lesions treated, dose fractionation, prescription points and dosimetric criteria.

Patients were often heavily pre-treated with chemotherapy, surgery or other local ablative therapies. Until recently, SBRT has been used when the liver metastases are no longer amenable to other treatment (that is, as a last resort).

Local control rates are 70–100% at 1 year, and 60–90% at 2 years. Several factors predicting local control may be identified, which may help in patient selection for treatment. The most consistently observed correlation with local control is baseline tumour volume. Rusthoven et al. (2009) report a superior local control rate for tumours less than 3cm (100% vs 77% at 2 years, p=0.015). A smaller number of tumours (<3) and smaller size (<6cm) predicts for better outcomes. Also, delivered BED>117Gy₁₀ is associated with improved local control at 1 year.

**External beam radiotherapy (and chemo-radiation):**

- There is currently no evidence to support adjuvant post-operative radiation therapy.
- There is no Phase III evidence for radiotherapy improving survival or the quality of life in advanced disease.
- The role of chemo-radiation (chemotherapy combined with local radiation) remains to be established in randomised clinical trials as local and systemic toxicity is also concomitantly increased.
- Radiation alone still has potential important palliative value for painful tumours, uncontrolled bleeding, etc.

**Patient selection criteria**

Inclusion criteria:
- Unresectable tumour or inappropriate for other treatment modalities
- Karnofsky performance status (KPS) ≥60
- Life expectancy >3 months
• >700cc of uninvolved liver
• No chemotherapy within 2 weeks prior, and 4 weeks after, SABR
• No, or limited and potentially treatable, extrahepatic disease
• Recovered from any previous therapy (such as surgery, chemotherapy or radiotherapy to other areas) with a minimum of 2 weeks break
• Up to three metastases, with no limitation on actual size of a given tumour provided that functional residual volume and organ at risk (OAR) dose constraints can be met
• Adequate organ function, defined as:
  – Haemoglobin 9.0g/dL
  – Absolute neutrophil count 1.5bil/L
  – Platelets 80bil/L
  – Bilirubin <3.0 times upper limit of normal
  – INR <1.3 or correctable with vitamin K and unless the patient is taking warfarin/coumarin, AST or ALT <5.0 times upper limit of normal
  – Creatinine less than 200umol/L. If creatinine is above the normal range, consideration should be given to dynamic renal scintigraphy (renography) if there is anticipated to be any appreciable renal dose from the delivery of treatment.

Exclusion criteria:
• Active hepatitis or clinically significant liver failure (encephalopathy, portal hypertension, varices)
• Clinically apparent ascites
• Prior radiotherapy to the right upper abdomen (unless 700cc normal unirradiated liver <17Gy)
• If patient is for fiducial placement: gold allergy, coagulopathy preventing safe fiducial placement
• Any previous radiotherapy where the mean dose to the liver was 15Gy (conventional fractionation), or where beams would be likely to overlap with those used to deliver SBRT or where previous doses to other critical normal structures would make reirradiation unsafe
• Any other severe co-morbidity such as unstable angina, congestive cardiac failure or transmural MI requiring hospitalisation in the preceding 6 months, or acute bacterial/fungal infection requiring intravenous antibiotics
• CNS metastases.

Suggested fractionation schemes
• 18–30Gy in a single fraction (SABR)
• 45–60Gy in 3# over 3–10 days (SABR)
• 50–60Gy in 5# over 5–12 days (SABR)
• 60Gy in 8# over 10 days IMRT
• 50–60Gy in 10# over 12 days (IMRT)
• Palliation of liver pain – 8Gy single fraction, 20Gy in 5#, 30Gy in 15#.
**Acute toxicity**

Overall, rates of Grade 1–2 toxicity are reported to range from 0–27% and G3–4 toxicities are observed in around 5%. The rate of morbidity for liver radiation is reported to be independent of the dose-fractionation schedule, and the toxicity rates are consistently low despite the heterogeneity of dose/fractionation schedules, and delivery systems. The likely explanation is the limited dose delivered to uninvolved liver and the parallel functioning of liver parenchyma. The most commonly reported toxicities are fatigue, right upper quadrant pain, low grade pyrexia, transaminase rise (normally settles by 3 months post-treatment), nausea and loss of appetite.

A syndrome of minor pain, fever and chills is observed in some patients – Grade 1 (requiring no treatment) in 14%, and G2 (requiring treatment with analgesics/steroids) in 13%, usually occurring within 1–3 weeks of treatment. Rates of gastric ulceration and esophagitis are low (G2 in 7%, G3 in 3%) and most centres advise the use of prophylactic proton-pump inhibitors. The rates of radiation induced liver disease (RILD) are notably very low in all published series. Child-Pugh B and Hepatitis B carriage are associated with greater risk of RILD.

Rates of transaminase derangement are also low. For example, Grade 1/2 elevation of liver function tests was observed in 28% of patients treated with 30–55Gy (median 48Gy) by Katz et al. (2007) and transient elevation of liver enzymes described as mild-moderate is noted in 31–36% of patients receiving 25–60Gy in 3#.

Several studies have reported the use of liver SBRT in patients who have previously undergone surgical resection and/or RFA, and reported low levels of toxicity, suggesting that SBRT is safe to use in this context.

**Table A5.1: SBRT liver suggested constraints**

<table>
<thead>
<tr>
<th>Organ at risk</th>
<th>Single # constraints</th>
<th>Three # constraints</th>
<th>Five # constraints</th>
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<tr>
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<td>700cc&lt;21Gy</td>
<td>RILD</td>
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<td>V18&lt;0.35cc</td>
<td>V23&lt;0.35cc</td>
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<td>V12&lt;1.2cc</td>
<td>V14.5&lt;1.2cc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14Gy point dose</td>
<td>22Gy point dose</td>
<td>30Gy point dose</td>
<td></td>
</tr>
<tr>
<td>Esophagus</td>
<td>V12&lt;5cc</td>
<td>V18&lt;5cc</td>
<td>V20&lt;5cc</td>
<td>Stenosis, fistula, perforation</td>
</tr>
<tr>
<td></td>
<td>15Gy point dose</td>
<td>25Gy point dose</td>
<td>35Gy point dose</td>
<td></td>
</tr>
<tr>
<td>Heart/Pericardium</td>
<td>V16&lt;15cc</td>
<td>V24&lt;15cc</td>
<td>V32&lt;15cc</td>
<td>Pericarditis</td>
</tr>
<tr>
<td></td>
<td>22Gy point dose</td>
<td>30Gy point dose</td>
<td>38Gy point dose</td>
<td></td>
</tr>
<tr>
<td>Rib</td>
<td>V22&lt;1cc</td>
<td>V29&lt;1cc</td>
<td>V35&lt;1cc</td>
<td>Chronic pain or fracture</td>
</tr>
<tr>
<td></td>
<td>30Gy point dose</td>
<td>37Gy point dose</td>
<td>43Gy point dose</td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td>V23&lt;10cc</td>
<td>V30&lt;10cc</td>
<td>V37&lt;10cc</td>
<td>Chronic ulceration</td>
</tr>
<tr>
<td></td>
<td>26Gy point dose</td>
<td>33Gy point dose</td>
<td>39.5Gy point dose</td>
<td></td>
</tr>
<tr>
<td>Stomach</td>
<td>V11&lt;10cc</td>
<td>V16.5&lt;10cc</td>
<td>V18&lt;10cc</td>
<td>Chronic ulcer, fistula, perforation</td>
</tr>
<tr>
<td></td>
<td>12Gy point dose</td>
<td>22Gy point dose</td>
<td>32Gy point dose</td>
<td></td>
</tr>
</tbody>
</table>
Organ at risk | Single # constraints | Three # constraints | Five # constraints | Dose limiting toxicity
---|---|---|---|---
Duodenum | V11<5cc V9<10cc 12Gy point dose | V16.5<5cc V11.5<10cc 22Gy point dose | V18<5cc V12.5<10cc 32Gy point dose | Chronic ulcer, fistula, perforation
Jejunum/Ileum | V12<5cc 15Gy point dose | V18<5cc 25Gy point dose | V19.5<5cc 35Gy point dose | Enteritis, obstruction, perforation
Colon/Rectum | V14<20cc 18Gy point dose | V24<20cc 28Gy point dose | V25<20cc 38Gy point dose | Colitis, fistula, perforation
Renal hilum/vascular trunk | 10.6Gy to 67% | 18.6Gy to 67% | 23Gy to 67% | Malignant hypertension
Kidney | 200cc<8.5Gy | 200cc<16Gy | 200cc<17.5Gy | Renal dysfunction
Lung (right and left) | 1,500cc<7Gy | 1,500cc<11.5Gy | 1,500cc<12.5Gy | Pneumonitis

Note: Point dose <0.035cc

Follow-up and recurrence

Follow-up

Following a liver resection for CLM at the centre MDT, patients will be seen in the centre HPB outpatient clinic 2 to 3 weeks post-discharge. By then, plans for further treatment should be in place with their local oncologist. If there are no active surgical/hepatological issues, patients can be discharged from further HPB follow-up. Referral back to the specialist liver MDT would be triggered by evidence of disease recurrence within the remaining liver on surveillance CT scans.

In cases where further surgery (i.e. a staged hepatectomy) or other interventional procedures (i.e. RFA), or in cases where there is known residual disease within the liver, patients will continue to attend HPB outpatient clinics until all active issues are resolved.

Although the issue of post-liver resection baseline CT scan is still a matter for debate, it is appropriate for these patients to have a CT scan locally 4–6 weeks after their resection when post-operative changes have diminished and regeneration would be expected to have mostly completed. It would also roughly match the initiation of their adjuvant chemotherapy (when appropriate).

The CT surveillance should follow a 6-monthly pattern for the first 3 years following liver resection, as the bulk of recurrences are observed during that timeframe, and a 12-monthly pattern thereafter until 5 years post-resection. These surveillance CTs should be promptly sent for review at the centre MDM.

Clinical examination, liver function tests and tumour markers should complete the surveillance protocol. The above follow-up should be facilitated locally.

Recurrent metastatic liver disease

Patients who have undergone a liver resection for their CLM and present with recurrent disease in their liver remnant should be assessed for repeat hepatectomy in the same way as for their first resection.

Repeat hepatectomies for CLM in high-volume centres follow the same pattern of morbidity and mortality as the primary liver resections. Furthermore, the prognosis for these patients seems to be unaffected by
the number of liver resections, but rather by the ability to remove all measurable disease with enough remnant functional liver.

5. Gruenberger T, Bridgewater JA, Chau I et al. (2013) Randomized, phase II study of bevacizumab with mFOLFOX6 or FOLFOXIRI in patients with initially unresectable liver metastases from colorectal cancer: Resectability and safety in OLIVIA. *J Clin Oncol* 31, 2013 (suppl; abstr 3619^a^)
Appendix 6: LCA Key Worker Policy

Definition

A key worker is a person who, with the patient’s consent and agreement, takes a key role in coordinating the patient’s care and promoting continuity, ensuring the patient knows who to access for information and advice in relation to their cancer diagnosis. In addition, the key worker will facilitate patients making informed decisions about their treatment.

The implementation of the key worker role is a requirement of the National Cancer Peer Review Programme and detailed in the Manual for Cancer Services, originally published by the National Cancer Action Team (NCAT), and related site-specific Improving Outcomes Guidance, issued by the National Institute for Health and Care Excellence (NICE).

Principles and responsibilities

Designation

1. The key worker is a named clinical member of the site-specific multidisciplinary team (MDT), and acts as the point of contact between the patient and MDT.
2. The key worker is a healthcare professional.
3. The key worker is assigned by the core Clinical Nurse Specialist (CNS) of an MDT, agreed by the MDT and recorded within the patient record and multidisciplinary meeting proforma.
4. The name of the key worker, designation and contact details will also be recorded in the patient handheld record (PHR), if used, and included in all correspondence and in the patient medical records. All entries in the medical notes will comply with the NHS Litigation Authority standards.

Access

5. All cancer patients will be made aware of their allocated key worker, but have the right to ask for an alternative if they prefer. This will usually happen at diagnosis.
6. The key worker will provide a contact number to all the patients for whom they act as the key worker.

Multi-professional communication

7. If a more appropriate person is identified as a key worker at a point in the patient’s pathway, this will be discussed and agreed by the patient and the new key worker, and recorded in the patient’s notes. This situation is most likely to arise with referral to the palliative care team. In such cases the palliative care CNS will check if a key worker has already been identified for the patient by the relevant tumour MDT. The palliative care CNS will then negotiate and document care responsibilites in the patient’s notes.
8. The key worker may change as patients pass through various stages of the care trajectory or when care is transferred to a different Trust. It is the responsibility of the key worker to hand over to the next one, to document this in the patient’s notes and to keep the patient informed.
9. The key worker will lead on patient communication issues and coordination of the pathway for patients referred to the team.
10. The key worker will ensure that the patient pathway is coordinated and that all relevant information is transferred to the appropriate professionals as the patient moves across care boundaries, e.g. on admission to and discharge from institutions, when care is transferred between teams.

11. The key worker has responsibility for ensuring holistic needs assessments (HNAs) are recorded/documented in patient records.

**Patient communication and support**

12. Where possible, the key worker will be available to support the patient on diagnosis to signpost and provide them with information and contacts for the MDT, national information and support services, self-help groups and associated site-specific support.

13. If the key worker is not available at the time of diagnosis, the person who is providing support at the time will ensure that the patient is aware of the key worker role and provide the relevant contact details.

14. The key worker will be accessible to the patient as a constant point of contact, handing over to colleagues when unavailable and making sure that the patient has clear information about alternative contacts and cover arrangements.

15. The key worker will provide information, care and support throughout the patient journey regardless of the patient’s condition, liaising between health professionals to ensure continuity of care and a seamless service.

**Data/audit**

16. The key worker will contribute to the audit of the key worker role in their organisation.

**Annex A**

**NCAT peer review standard**

There should be an operational policy whereby a single named key worker for the patient’s care at a given time is identified by the MDT members for each individual patient and the name and contact number of the current key worker is recorded in the patient’s case notes. The responsibility for ensuring that the key worker is identified should be that of the nurse MDT member(s).

The above policy should have been implemented for patients who came under the MDT’s care after publication of these measures and who are under their care at the time of the peer review visit.

**Notes**

- According to the NICE supportive and palliative care guidance, a key worker is a person who, with the patient’s consent and agreement, takes a key role in coordinating the patient’s care and promoting continuity, e.g. ensuring that the patient knows who to access for information and advice. This is not intended to have the same connotation as the key worker in social work.

- It may be necessary to agree a single key worker across both a cancer site-specific MDT and the specialist palliative care MDT for certain patients.
Appendix 7: Inter-Trust Referral Protocol

A cancer patient’s pathway typically covers one, two or three Trusts, which are usually, but not always, within the same integrated cancer system.

Cancer waiting times (CWT) have put an additional imperative on Trusts to ensure that all patient referrals are managed as efficiently as possible so as to minimise waiting times, eliminate breaches and report accurately on performance against targets.

To achieve this, a formal, structured means of communicating is required in order to communicate a cancer patient dataset between secure points in referring and referred to Trusts with a minimum of delay.

Since the prime purpose of this data transfer is to minimise waiting times, eliminate breaches, and report accurately on performance, it is in the first instance an addition to current referral practices.

Protocol

The following protocol should be used for all inter-Trust referral of cancer patients:

- Patients are identified by NHS number and date of birth. In cases where the NHS number cannot be obtained, the additional identifying details of name and postcode will be sent. The receiving Trust, which will in the majority of cases be the cancer centre, will then make further attempts to ascertain the NHS number.
- Patient-level data on any patient will only be accessible in Trusts where that patient is treated and by staff within these Trusts who undertake to preserve patient confidentiality according to their standard terms of employment.
- Reports at patient level will be made available to staff who have a need to know within Trusts where the patient is treated. Such reports will contain only information on the Trust’s registered patients.
- Reports of aggregated data across all LCA Trusts will be made available to the LCA management and clinical commissioning group management when their accuracy has been confirmed by individual Trusts.

Secure transmission of data

The method for secure transmission of data is as follows:

- Data will be transmitted between identified named contacts and secure faxes or email addresses in Trusts where the patients are treated.
- The MDT coordinator at the referring Trust telephones the MDT coordinator at the receiving Trust immediately after the meeting.
- The forms are then transmitted by email or fax as agreed by the two MDT coordinators.
- The receiving MDT coordinator confirms receipt.
- The receiving MDT coordinator sends the completed form back to the referring Trust when the patient has actually been treated.
- MDT coordinators should call the centres to which they normally refer patients even if there are no referrals at a particular meeting.
## Table A7.1: Referrals dataset (mandatory items)

<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
<th>Nearest CWT item for information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of tertiary referral</td>
<td>The date that the decision to refer the patient was taken at the referring Trust. This is normally the data of the MDT meeting</td>
<td>No match</td>
</tr>
<tr>
<td>Referring Trust hospital</td>
<td></td>
<td>1.2 Local patient identifier</td>
</tr>
<tr>
<td>NHS number</td>
<td>Primary identifier</td>
<td>1.1 NHS number</td>
</tr>
<tr>
<td>{name}</td>
<td>Alternative primary identifier if NHS number not available</td>
<td>1.5 Patient family or surname</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6 Patient forename or personal name</td>
</tr>
<tr>
<td>{postcode}</td>
<td>Alternative primary identifier if NHS number not available</td>
<td>1.8 Postcode of usual address (at diagnosis)</td>
</tr>
<tr>
<td>Date of birth</td>
<td>Secondary identifier</td>
<td>1.10 Birth date</td>
</tr>
<tr>
<td>Urgent cancer referral type</td>
<td>The cancer site of referrals</td>
<td>2.12 Urgent cancer referral type</td>
</tr>
<tr>
<td>Date of urgent GP referral</td>
<td></td>
<td>2.5 Cancer referral decision date</td>
</tr>
<tr>
<td>2-week wait flag</td>
<td></td>
<td>2.4 Cancer referral priority type</td>
</tr>
<tr>
<td>Hospital referred from</td>
<td></td>
<td>1.3 Organisation code (provider first seen)</td>
</tr>
<tr>
<td>Hospital referred to</td>
<td></td>
<td>1.3 Organisation code (provider first treatment)</td>
</tr>
<tr>
<td>Pathway adjustment at the date of tertiary referral (number of days)</td>
<td>Note that the relevant CWT adjustments are between urgent GP referral and first seen (if applicable) and between the patient being first seen and the decision to treat date</td>
<td>2.14 Waiting time adjustment (first seen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16.1 Waiting time adjustment (decision to treat)</td>
</tr>
<tr>
<td>Pathway adjustment reason</td>
<td></td>
<td>2.15 Waiting time adjustment reason (first seen)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16.3 Waiting time adjustment reason (decision to treat)</td>
</tr>
</tbody>
</table>
### Table A7.2: Referrals dataset (decision to treat items)

<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
<th>Nearest CWT item for information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of decision to treat</td>
<td>The date at which first treatment is agreed with the patient</td>
<td>No match, but see below</td>
</tr>
</tbody>
</table>
| Treatment decision type                    | Surgery, anti-cancer drug regimen, teletherapy, brachytherapy, specialist palliative | In combination with the above, would be:  
7.5 Decision to treat date (surgery)  
9.4 Decision to treat date (anti-cancer drug regimen)  
10.3 Decision to treat date (teletherapy treatment course)  
11.3 Decision to treat date (brachytherapy treatment course)  
12 Decision to treat date (specialist palliative treatment course) |
| Waiting time adjustment (treatment)        | The number of days that should be removed from the waiting time between decision to treat date and date of first definitive treatment | 16.2 Waiting time adjustment (treatment)                                                          |
| Waiting time adjustment reason (treatment) | The prime reason for the adjustment                                          | 16.4 Waiting time adjustment reason (treatment)                                                    |

### Table A7.3: Referrals dataset (items to be fed back to referring Trust)

<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
<th>Nearest CWT item for information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of first treatment</td>
<td>The date of the first treatment (for surgery, the date of admission)</td>
<td>No match, but see below</td>
</tr>
</tbody>
</table>
| First treatment type                       | Surgery, anti-cancer drug regimen, teletherapy, brachytherapy, specialist palliative | In combination with the above, would be  
7.8 Start date (surgery hospital provider spell)  
9.10 Start date (anti-cancer drug regimen)  
10.8 Start date (teletherapy treatment course)  
12 Start date (brachytherapy treatment course)  
10.3 Start date (specialist palliative treatment course) |
| Waiting time adjustment (treatment)        | The number of days that should be removed from the waiting time between decision to treat date and date of first definitive treatment | 16.2 Waiting time adjustment (treatment)                                                          |
| Waiting time adjustment reason (treatment) | The prime reason for the adjustment                                          | 16.4 Waiting time adjustment reason (treatment)                                                    |
Appendix 8: Summary of the British Society of Gastroenterology Guidelines for Colonoscopy Examinations

This appendix summarises the British Society of Gastroenterology (BSG) guidelines for colonoscopy examinations.¹

**Table A8.1: Screening processes per disease group**

<table>
<thead>
<tr>
<th>Disease group</th>
<th>Screening procedure</th>
<th>Time of initial screen</th>
<th>Screening procedure and interval</th>
<th>Annual procedures/300,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal cancer</td>
<td>Consultation, liver function tests and colonoscopy</td>
<td>Colonoscopy at 1 year</td>
<td>Liver scan within 2 years post-op Coloscopy 5-yearly until &gt;75 years</td>
<td>175</td>
</tr>
<tr>
<td>Colonic adenomas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low risk:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–2 adenomas, both &lt;1cm</td>
<td>Colonoscopy</td>
<td>No surveillance or 5 years</td>
<td>Cease follow-up after negative colonoscopy</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate risk:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3–4 adenomas or at least one adenoma &gt;1cm</td>
<td>Colonoscopy</td>
<td>3 years</td>
<td>Every 3 years until two consecutive negative colonoscopies, then no further surveillance</td>
<td></td>
</tr>
<tr>
<td><strong>High risk:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;5 adenomas or &gt;3 with at least &gt;1cm</td>
<td>Colonoscopy</td>
<td>1 year</td>
<td>Annual colonoscopy until out of this risk group then interval colonoscopy as per intermediate risk group</td>
<td></td>
</tr>
<tr>
<td>Large sessile adenomas removed piecemeal</td>
<td>Colonoscopy or flexible sigmoidoscopy (depending on polyp location)</td>
<td>3-monthly until no residual polyp; consider surgery</td>
<td>Colonoscopy 3-yearly in second decade, 2-yearly in third decade, subsequently annually</td>
<td>46</td>
</tr>
<tr>
<td>Disease group</td>
<td>Screening procedure</td>
<td>Time of initial screen</td>
<td>Screening procedure and interval</td>
<td>Annual procedures/300,000 population</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Ulcerative colitis and Crohn’s colitis</td>
<td>Colonoscopy + biopsies every 10cm</td>
<td>10 years: pancolonic dyespray with targeted biopsy. If no dyespray, then 2–4 random biopsies every 10cm</td>
<td>Low risk 5-yearly</td>
<td>20</td>
</tr>
<tr>
<td><strong>Low risk:</strong></td>
<td></td>
<td></td>
<td>Intermediate risk 3-yearly</td>
<td>10</td>
</tr>
<tr>
<td>Extensive colitis without inflammation or left-sided colitis or Crohn’s colitis</td>
<td></td>
<td></td>
<td>High risk 1-yearly</td>
<td>6</td>
</tr>
<tr>
<td><strong>Intermediate risk:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive colitis with mild active disease, or pseudopolyps or first-degree relative (FDR) &lt;50 years with colorectal cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High risk:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive moderate colitis, or stricture or dysplasia in last 5 years or PSC or FDR &lt;50 years with colorectal cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acromegaly</td>
<td>Colonoscopy</td>
<td>At 40 years</td>
<td>Colonoscopy 5-yearly</td>
<td>1</td>
</tr>
<tr>
<td>Uterero-sigmoidostomy</td>
<td>Flexible sigmoidoscopy</td>
<td>10 years after surgery</td>
<td>Flexible sigmoidoscopy annually</td>
<td>3</td>
</tr>
</tbody>
</table>
Table A8.2: Screening processes per family group

<table>
<thead>
<tr>
<th>Family group</th>
<th>Lifetime risk of death from colorectal cancer</th>
<th>Screening procedure</th>
<th>Age at initial screen</th>
<th>Screening procedure and interval</th>
<th>Annual procedures/300,000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familial adenomatous polyposis (FAP) and variants, or MUTYH-associated polyposis</td>
<td>1 in 2.5</td>
<td>Genetic testing</td>
<td>Puberty</td>
<td>Colonoscopy/Flexible sigmoidoscopy 12-monthly Colectomy if +ve. 3-yearly OGD</td>
<td>10</td>
</tr>
<tr>
<td>Juvenile polyposis and Peutz-Jeghers</td>
<td>1 in 6</td>
<td>Genetic testing</td>
<td>Puberty</td>
<td>2-yearly Colonoscopy</td>
<td>6</td>
</tr>
<tr>
<td>At risk Lynch syndrome/hereditary non-polyposis colorectal cancer</td>
<td>1 in 6</td>
<td>Genetic testing</td>
<td>Age 20–25 years</td>
<td>Colonoscopy every 18–24 months to age ≥75 years</td>
<td>50</td>
</tr>
<tr>
<td>3 x FDR, none &lt;50 years, or 2 x FDR with colorectal cancer, average age &lt;60 years</td>
<td>1 in 6–10</td>
<td>Colonoscopy</td>
<td>Age 50</td>
<td>Colonoscopy every 5 years to age ≥75 years</td>
<td>70</td>
</tr>
<tr>
<td>1 x FDR &lt;50 years with colorectal cancer, or 2 x FDR, average age &gt;60 years</td>
<td>1 in 12</td>
<td>Colonoscopy</td>
<td>Single procedure age 55 years</td>
<td>Colonoscopy</td>
<td>25</td>
</tr>
</tbody>
</table>

Appendix 9: Pathological Staging – Definitions

Colorectal cancer

All cases should be reported using the dataset published by the Royal College of Pathologists published in 2014 (www.rcpath.org/publications-media/publications/datasets/colorectal-cancer). We recommend, however, that all cases should be staged using both TNM 5th and 7th editions (see Tables A9.1 and A9.2) as well as the Duke’s staging system (see Table A9.3). Below are notes which highlight key points.

TNM staging

For TNM staging, the ‘T’ stage and the ‘N’ stage are derived from the extent of local spread and lymph node metastases. The prefix ‘p’ is used to indicate pathological staging. If the patient has had pre-operative chemotherapy or radiotherapy, the prefix ‘yp’ is used to indicate that the stage found may not be the presenting stage of the tumour.

Table A9.1 TNM staging 5th edition

<table>
<thead>
<tr>
<th>pT1</th>
<th>Invades submucosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>pT2</td>
<td>Invades muscularis propria</td>
</tr>
<tr>
<td>pT3</td>
<td>Invades subserosa, non-peritonealised pericolic/peri-rectal tissues</td>
</tr>
</tbody>
</table>
| pT4     | a. Tumour cells have invaded adjacent organs or structures  
          b. Tumour cells have breached the visceral peritoneum |
| pN1     | 1–3 nodes involved     |
| pN2     | 4+ nodes involved      |

Table A9.2: TNM staging 7th edition

<table>
<thead>
<tr>
<th>pT1</th>
<th>Invades submucosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>pT2</td>
<td>Invades muscularis externa</td>
</tr>
<tr>
<td>pT3</td>
<td>Invades subserosa, non-peritonealised pericolic/peri-rectal tissues</td>
</tr>
</tbody>
</table>
| pT4     | a. Perforates visceral peritoneum  
          b. Directly invades other organs or structures |
| N1      | a. 1 regional lymph node  
          b. 2–13 regional lymph nodes  
          c. Tumour deposits in the serosa or in non-peritonealises |
| N2      | a. 4–6 regional lymph nodes  
          b. 7 or more regional lymph nodes |
The following should be noted:

- In determining the pT stage, tumours that have perforated into the peritoneal cavity are regarded as pT4, irrespective of other factors.
- Direct intramural spread of caecal carcinomas into the terminal ileum does not affect the pT stage. However, direct extramural spread (across the serosa) of a colorectal carcinoma into another part of the large or small intestine corresponds to pT4.
- Pathological M staging can only be based on distant metastases that are submitted for histology by the surgeon and will therefore tend to underestimate the true M stage. Pathologists will therefore only be able to use pM1 (distant metastases present) or pMX (distant metastases unknown).
- Metastatic deposits in lymph nodes distant from those surrounding the main tumour or its main artery in the specimen, which will usually be submitted separately by the surgeon (e.g. in para-aortic nodes or nodes surrounding the external iliac or common iliac arteries), are counted as distant metastases and hence pM1.

**Table A9.3: Dukes’ stages**

<table>
<thead>
<tr>
<th>Dukes A</th>
<th>Growth limited to wall, nodes negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dukes B</td>
<td>Growth beyond muscularis propria, nodes negative</td>
</tr>
<tr>
<td>Dukes C1</td>
<td>Nodes positive and apical node negative</td>
</tr>
<tr>
<td>Dukes C2</td>
<td>Apical node positive</td>
</tr>
<tr>
<td>Dukes D</td>
<td>Histologically proven distant metastasis</td>
</tr>
</tbody>
</table>

**Complete resection at all margins**

- This includes the doughnuts, the ends of the specimen and, for rectal tumours, the mesorectal circumferential resection plane.
- Where doughnuts and the ends of the specimen are not examined histologically because the tumour is >30mm away, these are assumed to be tumour-free.
- Circumferential margins of rectal tumours are regarded as involved if tumour extends histologically to <1mm from this margin.
- Peritoneal (serosal) involvement alone is not reason to categorise the tumour as incompletely excised.
- 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. This should be included in the conclusion of the report.

**Anal cancer**

There are no RCPATH guidelines for the reporting of anal cancers and so we have included histological reporting in the notes given here. These cases should be reported using TNM 7th edition.
TNM staging

Table A9.4: TNM staging of primary tumour (T)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>Primary tumour cannot be assessed</td>
</tr>
<tr>
<td>T0</td>
<td>No evidence of primary tumour</td>
</tr>
<tr>
<td>Tis</td>
<td>Carcinoma in situ</td>
</tr>
<tr>
<td>T1</td>
<td>Tumour 2cm or less in greatest dimension</td>
</tr>
<tr>
<td>T2</td>
<td>Tumour more than 2cm but not more than 5cm in greatest dimension</td>
</tr>
<tr>
<td>T3</td>
<td>Tumour more than 5cm in greatest dimension</td>
</tr>
<tr>
<td>T4</td>
<td>Tumour of any size invades adjacent organ(s): e.g. vagina, urethra, bladder (involvement of sphincter muscle(s) alone is not classified as T4)</td>
</tr>
</tbody>
</table>

Histology

Table A9.5: Lymph node (N)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX</td>
<td>Regional lymph nodes cannot be assessed</td>
</tr>
<tr>
<td>N0</td>
<td>No regional lymph node metastasis</td>
</tr>
<tr>
<td>N1</td>
<td>Metastasis in peri-rectal lymph node(s)</td>
</tr>
<tr>
<td>N2</td>
<td>Metastasis in unilateral internal iliac and/or inguinal lymph node(s)</td>
</tr>
<tr>
<td>N3</td>
<td>Metastasis in peri-rectal and inguinal lymph node(s) and/or bilateral internal iliac and/or inguinal lymph node(s)</td>
</tr>
</tbody>
</table>

Table A9.6: Distant metastasis (M)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MX</td>
<td>Presence of distant metastasis cannot be assessed</td>
</tr>
<tr>
<td>M0</td>
<td>No distant metastasis</td>
</tr>
<tr>
<td>M1</td>
<td>Distant metastasis</td>
</tr>
</tbody>
</table>

Complete resection at all margins

- This includes the doughnuts, the ends of the specimen and, for rectal tumours, the mesorectal circumferential resection plane.
- Where doughnuts and the ends of the specimen are not examined histologically because the tumour is >30mm away, these are assumed to be tumour-free.
- Circumferential margins of rectal tumours are regarded as involved if tumour extends histologically to <1mm from this margin.
- Peritoneal (serosal) involvement alone is not reason to categorise the tumour as incompletely excised.
- 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. This should be included in the conclusion of the report.
APPENDIX 9: PATHOLOGICAL STAGING – DEFINITIONS

1 Sobin LH, Wittekind CH. *UICC TNM Classification of Malignant Tumors*, 5th edition
2 Sobin LH, Gospodarowicz MK, Wittekind CH. *UICC TNM Classification of Malignant Tumours*, 7th edition
Appendix 10: Data Requirements of Colorectal Cancer Services

Colorectal cancer services within the London Cancer Alliance are required to submit data to nationally mandated datasets for patients diagnosed with colorectal cancer. These are as follows.

The Cancer Outcomes and Services Dataset (COSD)

The core dataset for all tumour types, including colorectal cancer, is mandated from January 2013 and the site-specific dataset is mandated from July 2013. Details of the dataset can be found on the National Cancer Intelligence Network (NCIN) website, at: www.ncin.org.uk/collecting_and_using_data/data_collection/cosd.aspx

The local cancer registry will be collating this dataset using Trust data feeds, which include the following:

- Trust PAS feed
- Trust pathology feed
- Trust radiology feed
- Trust multidisciplinary team (MDT) feed.

In line with the requirements set out in provider Trust contracts, this data should be submitted within 25 working days of the end of the month in which the activity took place.

National Audits – NBOCAP

The National Bowel Cancer Audit Program (NBOCAP) is managed by the National Clinical Audit Support Program (NCASP), within the health and social care Information Centre for the Association of Coloproctology of Great Britain and Ireland. The NBOCAP dataset which includes data on case mix, processes of care and clinical outcomes has been designed to enable assessment of MDTs and more recently individual surgeons’ performance compared with the national average. Details of the dataset can be found on Health and Social Care Information Centre website at www.hscic.gov.uk/bowel

Systemic Anti-Cancer Therapy (SACT) chemotherapy dataset

Trusts that provide chemotherapy to patients are required to submit data to the SACT dataset. Details of the audit and the dataset requirements are available at the dataset homepage: www.chemodataset.nhs.uk/home.aspx

National Radiotherapy Dataset (RTDS)

Trusts that provide radiotherapy to patients are required to submit data to the RTDS. Details of the audit and the dataset requirements are available at the dataset homepage: www.canceruk.net/rtservices/rtds

National Cancer Waiting Times Monitoring Data Set

Trusts are required to submit data to the Cancer Waiting Times Monitoring Data Set, which includes details of all patients with a 2-week wait referral and all patients’ treatments for cancer. Trusts are required to submit this data within 25 working days of the month in which patients were first seen for the 2-week wait target, or in the month in which the patient was treated.

The Cancer Waiting Times Monitoring Data Set can be found at: www.datadictionary.nhs.uk/data_dictionary/messages/clinical_data_sets/data_sets/national_cancer_waiting_times_monitoring_data_set_fr.asp
Appendix 11: A Summary of the Treatment Pathways of Colorectal Cancer

**Figure A11.1: Commissioning best-practice pathway for operable colon cancer (non-metastatic)**

1. Screening faecal occult blood test/ flexible sigmoidoscopy from 2012
2. Internal referral/other
3. GP referral/ 2-week wait
4. Straight to diagnostic testing*
   - 4a. Flexible sigmoidoscopy
   - 4b. Colonoscopy **
   - 4c. CT colonography
   - 4d. Biopsy
   - 4e. Polypectomy (minor surgery)
5. Staging
   - 5a. CT scan: chest, abdomen, pelvis
   - 5b. Standard blood tests
6. Colorectal multidisciplinary meeting (MDT)
7. Enhanced recovery programme
8. 1st outpatient appointment (OPA): Surgical (treatment plan, pre-op assessment and assessment of co-morbidities)
9. Surgical resection (laparoscopically unless contra-indicated)
10. Histopathology staging
11. Follow-up surgical OPA
12a. Oncology OPA
12b. Adjuvant chemotherapy
13. Follow-up As per LCA Colorectal Cancer Guidelines for Stratified FU
14. Survivorship
15. End of life
16. Palliative care

Notes:
*Best practice is for patients to go straight for diagnostic testing from GP referral except for complex cases with significant co-morbidity where they may not be fit for standard tests. If the test suggests cancer, a clinician should inform the patient at diagnostics appointment and arrange staging tests.
Figure A11.2: Commissioning best-practice pathway for colon cancer with synchronous metastatic
Notes:

* Best practice is for patients to go straight for diagnostic testing from GP referral except for complex cases with significant co-morbidity where they may not be fit for standard tests. If the test suggests cancer, a clinician should inform the patient at diagnostics appointment and arrange staging tests.

** Only to investigate for metastases if proposing radical/mutilating surgical treatment.

*** May or may not be undertaken in same surgical episode as primary resection.
Figure A11.3: Commissioning best-practice pathway for colon cancer with metachronous metastatic disease

Notes:
1. Patient should already be on follow-up.
2. Widespread metastatic disease (inoperable).
3. Oligometastatic disease (lung, liver or other sites of disease suitable for radical treatment including surgery, radiotherapy and/or other loco-regional therapy).
4. Not suitable for upfront surgery or loco-regional therapy.
5. Suitable for upfront surgery or loco-regional therapy.
6. Reconsider surgery or loco-regional therapy after chemotherapy.
7. Further chemotherapy may be required.
Figure A11.4: Commissioning best-practice pathway for emergency presentations

1. Emergency – via A&E
2. Emergency – via GP
3. Resuscitation and assessment
   3a. CT scan: chest, abdomen, pelvis
   3b. Standard blood tests
4. Surgical resection (laparoscopically unless contra-indicated)
5. Stenting
6. Colostomy (functioning/defunctioning) and ongoing stoma management
   6a. Colostomy
6b. Second surgery: closure temporary stomas
7. Post-operative imaging
8. Colorectal multidisciplinary team meeting (MDT)

Join elective pathways
* Best practice is for patients to go straight for diagnostic testing from GP referral except for complex cases with significant co-morbidity where they may not be fit for standard tests. If the test suggests cancer, a clinician should inform the patient at diagnostics appointment and arrange staging tests.
Figure A11.6: Commissioning best-practice pathway for late rectal cancer (T2–4, N0–2, M0)

1. Screening faecal occult blood test/ flexible sigmoidoscopy from 2012
2. Internal referral/other
3. GP referral/2-week wait
4. Straight to diagnostic testing*
   4a. Flexible sigmoidoscopy
   4b. Colonoscopy
   4c. CT colonography
   4d. Biopsy
   4e. Polypectomy (minor surgery)
5. Staging
   5a. CT scan: chest, abdomen, pelvis
   5b. MRI pelvis
   5c. Endorectal ultrasound
6. Colorectal multidisciplinary meeting (MDT)
7. Enhanced recovery
8. 1st outpatient appointment (OPA): Surgical – results clinic
9a. Neo-adjuvant down-staging chemotherapy/ radiotherapy (long course)
9b. Second pre-operative MRI scan
10. Short course neo-adjuvant radiotherapy
11. 3rd OPA: Surgical
12. Stenting
13. Enhanced recovery
14. Surgical resection (laparoscopically unless contra-indicated)
15a. Colostomy or ileostomy and ongoing stoma management
15b. Closure temporary stomas
16. Histopathology/re-staging
17. Weekly MOT
18a. Oncology OPA
18b. Adjuvant chemotherapy
19. Follow-up OPA
20. Survivorship
21. End of life
22. Palliative care
23. CT and blood tests as per Colorectal Cancer Guidelines for stratified FU

* Best practice is for patients to go straight for diagnostic testing from GP referral except for complex cases with significant co-morbidity where they may not be fit for standard tests. If the test suggests cancer, a clinician should inform the patient at diagnostics appointment and arrange staging tests.
Figure A11.7: Commissioning best-practice pathway for rectal cancer (locally unresectable/medically inoperable). If metastatic disease, refer to Chapter 10)

* Best practice is for patients to go straight for diagnostic testing from GP referral except for complex cases with significant co-morbidity where they may not be fit for standard tests. If the test suggests cancer, a clinician should inform the patient at diagnostics appointment and arrange staging tests.
Appendix 12: Operational Guidelines for Stratified Follow-up of Colorectal Cancer Patients after Curative Surgery

- Patient cohort for the pilot phase will be surgical patients only.
- Inform patients about this pathway at the earliest opportunity in their care pathway.
- Assess for likelihood of disease recurrence, late effects and ability to self-manage. By following this process, clinicians are attempting to minimise anxiety/distress in the transition from active treatment to the follow-up phase of the cancer journey.

**MDT**

Risk stratify patients at two stages:
- At an MDT prior to the patient’s surgery
- At a post-surgical MDT to ensure that low-risk patients are suitable for the risk-stratified pathway.

Both MDTs will take into consideration the inclusion and exclusion criteria and staging information provided by histopathology.

**Proposed exclusion criteria**

- Private patients
- N2 disease (4+ lymph nodes involved) or R1 resections
- Patients with residual or metastatic disease
- Excessively anxious patients
- Those with severe learning disabilities or mental health issues
- Patients on clinical trials
- Patients with indeterminate findings on prior computed tomography (CT) imaging
- Patients with elevated carcinoembryonic antigen (CEA) levels
- Patients with chemotherapy toxicities (<grade 2).

Please note: long-course radiotherapy patients may need clinical oncology follow-up.

**Low-risk patients**

- T1 N0
- T2 N0
- T3 N0 (EMVI –ve).

**High-risk patients**

- T3 N0 (EMVI +ve)
- T4 N0
- Any T stage with either N1 or N2.

Trusts should modify the MDT proforma to capture this information and provide a tick box to indicate that the patient will be on a risk-stratified pathway for follow-up.
Diagnostic tests
Routine diagnostic tests are usually required for 5 years:

- CEA – 6-monthly
- Colonoscopy – at 1 year and then 5-yearly
- CT scan – 2 x CT scans within the first 3 years.

End-of-treatment consultation

- Timing of end-of-treatment consultation – 6 or 12 months post-treatment dependent on clinical indications.
- Trusts to decide if this consultation is with the consultant, clinical nurse specialist (CNS) or a combination of the two.
- The appointment will last approximately 30 minutes and is an educational session for patients and their carers. It will cover:
  - The patient’s treatment summary
  - Specific procedures for ongoing surveillance and detection of recurrence tailored to cancer type and treatment modalities
  - Arrangements for diagnostic testing – frequency and timing (see below)
  - Designation of a specific clinician for follow-up care, i.e. key worker
  - Late and long-term effects of treatment and medication
  - Signs and symptoms to be aware of – patients are advised to report any new symptoms promptly without waiting for their next scheduled appointment
  - Further help and support, including helpline – outline operating hours, response time perimeters and what happens if patients have symptoms that are a cause for concern (i.e. they are offered an appointment within 14 days).

NB: If the patient needs to return to the Trust for further investigations, they will be suspended on the risk-stratified pathway.

Information given to the patient

- Treatment summary
- Treatment side effects
- Signs and symptoms to report
- Helpline number and how the recall process works
- Patient consent to their follow-up programme after completion of treatment (patients need to be given a choice and can continue with traditional follow-up appointments if they wish).
Helpline and recall process

- Patients have access to a helpline which is available Monday–Friday 9–5. Their key worker (normally the CNS) will return their phone call as soon as is possible.

- During this call, patients will be triaged on the phone. If the CNS feels the patient needs to return to clinic, an appointment will be made within 14 days.

- If patients have any concerns out of hours, they should contact their GP or visit A&E.

Information for GPs

- A GP leaflet about risk-stratified pathways will be sent with a copy of the patient’s treatment summary.

- The helpline can be accessed by GP colleagues who require advice.

Management of missed appointments

- Follow local Trust policies for DNAs. There is a standard letter informing patients that they have missed their appointment for diagnostic testing. Trusts will send another appointment for a CT scan/colonoscopy and patients will be asked to visit their GP/local Trust for CEA blood tests.
**Figure A12.1: Stratification of patients for follow-up**

**Risk-stratification assessment at MDT based on radiology (CT/MRI)**

**Low-risk patients**
- T1 N0, T2 N0, T3 N0 (EMVI –ve), M0

**High-risk patients**
- T3 N0 (EMVI +ve), T4 N0 or any T stage with either N1 or N2, M0 or M1
- Patient has neo-adjuvant therapy (chemo/radio or both)

**Patient has surgery**

**Discussion at MDT of formal histology**

**Still low risk**
- (T1 N0, T2 N0, T3 N0 (EMVI –ve), M0)
- Suitable for risk-stratified follow-up

**Identified as high risk**
- (T3 N0 (EMVI +ve), T4 N0 or any T stage with either N1 or N2, M0 or M1)

**Further treatment with chemotherapy**
- Suitable for risk-stratified pathway

**End of treatment appointment with Consultant/CNS**
- Designation of a specific clinician for follow-up care
- Review of treatment summary
- Awareness of signs and symptoms of recurrence
- Programme of follow-up – frequency and type of diagnostics tests, indication of length of follow-up
- Assess patient ability for self-management
- Risk-stratified pathway information leaflet provided and reviewed with the patient
- Further help and support, including details of the Helpline
- Recall process
- Patients given choice of follow-up options available (outlined below)

**Patient attends for diagnostic follow-up test**

- Nurse-led telephone clinic
  - Patients called regardless of results
  - Letter sent to patient and GP

- Remote monitoring

- Continue to follow-up via outpatient appointments

**If results are within range set for the patient:**
- Patient and GP informed by letter

**If results are outside the range set for the patient:**
- Patient is called and offered a clinic appointment within 14 days
- Letter to patient and GP

**Helpline available to patients:** Monday–Friday 9am–5pm
Out of hours, patients should contact their out-of-hours GP service or visit local A&E

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Appendix 13: Children, Teenagers and Young Adults

Children below the age of 16

Children below the age of 16 years with a diagnosis of cancer or suspected cancer must be referred to the paediatric oncology team at the Principal Treatment Centre (PTC) and must not be managed exclusively by adult site-specific teams.

- All patients <1 year from both North and South Thames should be referred to Great Ormond Street Hospital.
- The joint PTC for children aged 1 year to 16 years for South Thames is the Royal Marsden Hospital, Sutton and St George’s Hospital.
- The PTC for North Thames (including North West London) is Great Ormond Street Hospital and University College London Hospital.

For certain tumour types that are uncommon in children (e.g. skin, melanoma, head and neck, thyroid, gastrointestinal, hepatobiliary), the paediatric oncology team should liaise with the appropriate site-specific MDT for advice about management and to agree surgical interventions. However, overall responsibility for managing the patient remains with the paediatric oncology team.

Contact details for the children’s PTCs are below.

**South Thames PTC contacts**

| The Royal Marsden NHS Foundation Trust | Lead Clinician – Dr Julia Chisholm  
julia.chisholm@rmh.nhs.uk  
020 8661 3549  
Paediatric oncology on-call registrar (new referrals)  
020 8915 6248 (24-hour line) |

**North Thames PTC contacts**

| Great Ormond Street Hospital for Children  
NHS Foundation Trust  
(patients aged <13 years) | Lead Clinician – Darren Hargrave  
darren.hargrave@nhs.net |
| University College London Hospitals  
NHS Foundation Trust  
(patients aged ≥13 years) | Lead Clinician – Dr Sara Stoneham  
sara.stoneham@uclh.nhs.uk  
020 3447 9950 |

**Teenagers and young adults**

Teenagers aged 16–18 should be managed at a PTC for teenager and young adult (TYA) cancers. Those aged 19–24 are given the choice of being managed at a PTC or TYA designated hospital.

- The PTC for TYA for South Thames is the Royal Marsden Hospital, Sutton.
- The PTC for North Thames (including North West London) is University College London Hospital.

All patients within the age range 16 to 24, regardless of place of care, should be referred to the TYA MDT at the relevant PTC.
### South Thames PTC contacts

| The Royal Marsden NHS Foundation Trust | Lead Clinician – Dr Julia Chisholm  
  julia.chisholm@rmh.nhs.uk  
  020 8661 3549  
  TCT Nurse Consultant for Adolescents & Young Adults – Louise Soanes  
  lsoanes@nhs.net |

### London Cancer Alliance TYA designated centre contacts allied to Royal Marsden Hospital PTC

| Joint centre (Guy’s and St Thomas’ NHS Foundation Trust/King’s College Hospital NHS Foundation Trust) | Guy’s and St Thomas’ | Lead Clinician – Dr Robert Carr  
  Robert.carr@gstt.nhs.uk  
  Lead Nurse – Gavin Maynard-Wyatt  
  Gavin.maynard-wyatt@gstt.nhs.uk |
| Joint centre (Guy’s and St Thomas’ NHS Foundation Trust/King’s College Hospital NHS Foundation Trust) | King’s College Hospital | Lead Clinician – Dr Donal McLornan  
  donal.mclornan@nhs.net  
  Lead Nurse – Gavin Maynard-Wyatt  
  Gavin.maynard-wyatt@gstt.nhs.uk |
| St George’s Healthcare NHS Trust | St George’s Hospital | Lead Clinician – Dr Jens Samol  
  jens.samol@stgeorges.nhs.uk  
  Lead Nurse – Linda Shephard  
  Linda.shephard@stgeorges.nhs.uk |

### North Thames PTC contacts

| University College London Hospitals NHS Foundation Trust | Lead Clinician – Dr Rachael Hough  
  Rachael.hough@uclh.nhs.uk  
  TCT Nurse Consultant for Teenagers & Young Adults – Wendy King  
  wendy.king@uclh.nhs.uk |

### London Cancer Alliance TYA designated centre contacts allied to University College London Hospital PTC

| Chelsea and Westminster Hospital NHS Foundation Trust | Chelsea and Westminster (HIV and skin only) | Lead Clinician – Dr Mark Bower (interim)  
  Mark.Bower@chelwest.nhs.uk  
  Lead Nurse – Kate Shaw (interim)  
  Kate.Shaw@chelwest.nhs.uk |
| Imperial College Healthcare NHS Trust | Charing Cross | Lead Clinician – Dr Josu de la Fuente (deputy)  
  j.delafuente@imperial.ac.uk  
  Lead Nurse – Sinead Cope  
  sinead.cope@imperial.nhs.uk |
| East and North Hertfordshire NHS Trust | Mount Vernon Cancer Centre | Lead Clinician (MVCC) – Dr Gordon Rustin  
  grustin@nhs.net  
  Lead Nurse (MVCC) – Laura Miles  
  laura.miles@nhs.net |
Appendix 14: LCA Holistic Needs Assessment Tool

London Holistic Needs Assessment

For each item below, please tick yes or no if they have been a concern for you during the last week, including today. Please also tick discuss if you wish to speak about it with your health professional.

Choose not to complete the assessment today by ticking this box ☐

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<thead>
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<th>Date of diagnosis:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Hospital/NHS number:</td>
<td></td>
</tr>
<tr>
<td>Diagnosis:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
</tbody>
</table>

Please tick the number that best describes the overall level of distress you have been feeling during the last week, including today:

10 ☐ Extreme distress
9 ☐ ☐
8 ☐ ☐
7 ☐ ☐
6 ☐ ☐
5 ☐ ☐
4 ☐ ☐
3 ☐ ☐
2 ☐ ☐
1 ☐ ☐
0 ☐ No distress

For health professional use

Date of diagnosis:

Diagnosis:

Pathway point:

Pathway point:

Practical concerns

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<tr>
<th>Practical concerns</th>
<th>Yes</th>
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<th>Discuss</th>
<th>Physical concerns</th>
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<th>No</th>
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</tr>
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<td>Housing or finances</td>
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<td>Wound care</td>
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<td>Transport or parking</td>
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<td>Passing urine</td>
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<td>Work or education</td>
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<td>☐</td>
<td>☐</td>
<td>Constipation or diarrhoea</td>
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<td>Information needs</td>
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<td>Indigestion</td>
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<td>Difficulty making plans</td>
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<td>☐</td>
<td>Nausea and/or vomiting</td>
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<td>Grocery shopping</td>
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<td>Changes in weight</td>
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<tr>
<td>Bathing or dressing</td>
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<td>Eating or appetite</td>
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<tr>
<td>Laundry or housework</td>
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<td>Changes in taste</td>
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<td>Breathlessness</td>
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<tr>
<td>Relationship with others</td>
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<td>☐</td>
<td>Pain</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Emotional concerns</td>
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<td>☐</td>
<td>Dry, itchy or sore skin</td>
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<tr>
<td>Loneliness or isolation</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Tingly in hands or feet</td>
<td>☐</td>
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<tr>
<td>Sadness or depression</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Hot flushes</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Worry, fear or anxiety</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Moving around or walking</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Anger, frustration or guilt</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Fatigue</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Memory or concentration</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Sleep problems</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Hopelessness</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Communication</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Sexual concerns</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Personal appearance</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Spiritual concerns</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Other medical condition</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Care Plan

During my holistic needs assessment, these issues were identified and discussed:

<table>
<thead>
<tr>
<th>Number</th>
<th>Issue</th>
<th>Summary of discussion</th>
<th>Actions required/by (name and date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>Breathlessness</td>
<td>Possible causes identified Coping strategies discussed Printed information provided</td>
<td>Referral to anxiety management programme; CNS to complete by 24th Dec</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Other actions/outcomes e.g. additional information given, health promotion, smoking cessation, 'My actions':

Signed (patient): Date:  
Signed (healthcare professional): Date:  

For health professional use

Date of diagnosis: Diagnosis: Pathway point:
Appendix 15: Best practice early detection pathway and referral guidelines

The following document is being recommended as best practice for the early detection of colorectal cancer in London.

**Primary care guidance for colorectal referral (aim to increase referrals for diagnostics)**

**Background:** There has been a modest improvement in the outcome of patients with bowel cancer since the Cancer Plan. However, the UK still has 10% fewer survivors from bowel cancer than Australia and Canada. GPs have a key role in early diagnosis. The following guidelines build on those for the 2-week wait pathway and the direct access guidelines for GPs and are expected to result in an increase in referrals to secondary care for diagnostic tests (see below). The threshold age for referring new onset colorectal symptoms is 60 years of age for 2013/14. The threshold age should be reduced to 55 years of age in 2014/15 and to 45 years of age in 2015 to enable CCGs to meet their commissioned goal to prevent avoidable deaths.

**Patients with bowel symptoms** (change in bowel habit, rectal bleeding and anaemia) **attending GP**:

Examine abdomen and do a rectal examination

Questions to consider:

1. Do symptoms fit with the 2-week NICE criteria?
   Yes – Refer to a diagnostic service under the two week rule
   If No, ask 2nd question

2. Is the patient 60 years or over?
   Yes – Refer to diagnostic service irrespective of duration of symptoms
   If No i.e. patient is 59 or younger. Check the following:
   a. Change in bowel habit to loose stools: >40 years and >6 weeks symptoms: Refer to diagnostic service
   b. Rectal bleeding: >40 years and >6 weeks symptoms OR >55 years any duration symptom: Refer to diagnostic service
   c. None of the above: do a FBC (if not done already): if anaemia < 10 females, < 11 males: refer to diagnostic service under 2-week rule; if anaemia > 10 females, > 11 males: refer to diagnostic service
   d. If none of the above, arrange a follow-up appointment with the patient within the next 4 weeks to check the symptoms have resolved, and/or refer to a colorectal/lower GI diagnostic service.

**Bowel awareness (aim to increase participation in screening programmes)**

**Background:** 40% of patients identified with bowel cancer through the National Bowel Cancer Screening programme have Stage I disease with a 95% five year survival rate. Only 5% of patients with symptoms are found to have Stage I disease.

GPs are encouraged to promote bowel cancer screening to patients with FOB attending the surgery for other purposes if >60 years of age (here patients will be receiving an invitation from the NBCSP to participate in FOB screening every two years). GPs are encouraged to respond to the letters informing them their patients have not taken up the opportunity to have bowel screening by contacting their patients and explaining the benefits of screening. Concerned patients over the age of 75 (70 in areas where the age extension has not yet happened) years may self-refer for screening by calling 0800 7076060 and requesting an FOBT kit.
GPs to promote bowel cancer screening with flexible sigmoidoscopy to patients attending the surgery for standard a check-up if 55 years (here patients will be receiving an invitation from the NBCSP to participate in a one off Flexible Sigmoidoscopy)

**Diagnostic Service (aim to investigate patients efficiently and appropriately)**

**Principles:**

1. Referral received to a designated referral centre ideally using a standardised proforma (designed in conjunction with local CCGs). Referrals will faxed to dedicated fax, email address or to a Choose and Book telephone consultation clinic (for triage)

2. Once received, referrals are triaged by a trained specialist nurse (patients may be contacted by telephone to check presenting symptoms and fitness) according to local policy (building on existing local experience) agreed with local CCGs to one of the following:
   a. Direct access colonoscopy (+ OGD if anaemia)
   b. Direct access flexible sigmoidoscopy
   c. Direct access CT colonography
   d. Outpatient consultation

3. Normal examinations, haemorrhoids, diverticulosis, IBS, functional constipation sent back to GP with advice on self-care and primary care medical management.

   Patient with polyps to be entered into surveillance managed at the acute trust level in accordance with the BSG guidelines. Where Trusts discharge the patient back to the GPs with advice on future plans to have colonoscopic screening, trust letters must state that the need to enter ‘colonoscopic screening for polyps’ as an active problem in the GP record so that any interval presentations can be assessed with this information.

4. Patients with cancer and IBD: treated in secondary care within cancer and IBD MDTs and followed up as per local policy agreed with local CCG.
Appendix 16: Community Specialist Palliative Care Referral Form

Specialist Palliative Care (SPC) Community and SPC Inpatient Unit Referral Form

<table>
<thead>
<tr>
<th>Specialist Palliative Care Community Teams &amp; Inpatient Units across South &amp; West London</th>
</tr>
</thead>
</table>
| Greenwich & Bexley Community Hospice  
  Bostall Hill, Abbey Wood SE2 0GB  
  Home care: Tel: 020 83205837 Fax: 020 83205839  
  Admissions: Tel: 020 8312244 Fax: 020 83124344 |
| Lewisham Macmillan Community Team  
  Lewisham High Street SE13 6LH  
  Tel: 020 8333 3017  
  Fax: 020 8333 3270 |
| St Christopher’s Hospice  
  Lawrie Park Rd, London SE26 6DZ  
  Home care: Tel: 020 87676555 Fax: 020 87675798  
  Admissions: Tel: 020 87684582 Fax: 02086505051  
  St Christopher’s Bromley  
  Tel: 01689 825755 Fax: 01689 892999 |
| Guy’s & St Thomas’ Community Team:  
  Guy’s Hospital, Great Maze Pond SE1 9RT  
  Tel: 020 71884754 Fax: 020 71884748 |
| Meadow House Hospice  
  Southall UB1 3HW  
  Tel: 020 89675179  
  Fax: 020 89675176 |
| St John’s Hospice  
  Grove End Road, St John’s Wood NW8 9NH  
  Tel: 020 78064040 Fax: 020 78064041 |
| Harlington Hospice  
  St Peter’s Way, Harlington UB3 5AB  
  Tel: 020 87590453 Fax: 020 87590600 |
| Michael Sobell House  
  Northwood, Middlesex HA6 2RN  
  Tel:01923 844531 Fax:01923 844565 |
| St Luke’s Hospice  
  Kenton Road, Harrow HA3 0YG  
  Tel: 020 83828001 Fax: 020 83828080 |
| Harrow Community Team  
  Kenton Road, Harrow HA3 0YG  
  Tel: 020 83828098 Fax: 020 83828085 |
| Pembroke Palliative Care Centre  
  Exmoor Street, W10 6DZ  
  Tel: 020 8962 4710  
  Inpatient Fax: 020 89624710  
  Community Services Fax: 020 89624713 |
| St Raphael’s Hospice  
  London Road, North Cheam SM3 9DX  
  Tel: 020 80997777 Fax: 020 8099 1724 |
| Hillingdon Community Team  
  Pield Heath Road, Uxbridge UB8 3NN  
  Tel:01895 279412 Fax:01895 279452 |
| Princess Alice Hospice  
  West End Lane, Esher KT10 8NA  
  Tel: 01372 461804  
  Fax: 01372 470937 |
| Trinity Hospice  
  Chalfont Common SW4 0RN  
  Tel: 020 7787 1000  
  Ref & Admissions Nurse: 020 77871065  
  Fax: 020 7787 1067 |

For further information and advice on these services, please visit the Help the Hospices service directory at:
http://www.helpsethospices.org.uk/about-hospice-care/find-a-hospice/uk-hospice-and-palliative-care-services/ and enter the postcode provided above.

Every LCA hospital has a Specialist Palliative Care team;
if your patient is a hospital inpatient, please contact the team, via the relevant hospital switchboard.

FAX MESSAGE

From:  
Tel:  
Fax No:  
Date:  

No. of pages (incl cover sheet):  

Additional information

Confidentiality: The content of this fax and attached documents are confidential and intended for the use of the addressee designated above. If you are not the addressee, you are hereby notified that you may not disclose, reproduce or otherwise disseminate or make use of this information for yourself or any third party. If you have received this in error, please notify us on the telephone number given above.

PLEASE SEND COPIES OF RECENT CLINICAL CORRESPONDENCE WITH THIS FORM – including recent clinic letters, blood tests and most recent imaging.

NB. INSUFFICIENT INFORMATION MAY DELAY PATIENT ASSESSMENT

PATIENT NAME ................................................................. NHS No: .................................................................

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Referral Form for SPC Community and Inpatient Units (2/3)

<table>
<thead>
<tr>
<th>Essential Patient Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surname</strong></td>
</tr>
<tr>
<td><strong>First Name</strong></td>
</tr>
<tr>
<td><strong>Address</strong></td>
</tr>
<tr>
<td><strong>Postcode</strong></td>
</tr>
<tr>
<td><strong>Tel</strong></td>
</tr>
<tr>
<td><strong>NHS number</strong></td>
</tr>
</tbody>
</table>

**Primary diagnosis(es)**

**Communication**
- **Fluent in English?** Yes | No | (If ‘No’ proceed with remaining questions)
- **First Language, if not English:**
- **Would interpreter be helpful to patient and Palliative Care staff?** Yes | No |

**Next of Kin/Patient Representatives**

<table>
<thead>
<tr>
<th><strong>District Nurse</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
<th><strong>General Practitioner</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td><strong>Name</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td><strong>Address</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Telephone</strong></td>
<td><strong>Fax</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relationship to patient</strong></td>
<td></td>
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</tr>
</tbody>
</table>

**Main Carer (if different from above)**

<table>
<thead>
<tr>
<th><strong>Social Services</strong></th>
<th><strong>Yes</strong></th>
<th><strong>No</strong></th>
<th><strong>Telephone</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Telephone</strong></td>
<td><strong>Fax</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relationship to patient</strong></td>
<td><strong>Tel</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reason for Referral**

| **Pain/symptom control** | **Home assessment and support** | | |
| **Emotional/psychological support** | **Hospital assessment** | | |
| **Social/financial** | **Day Care** | | |
| **Assessment for hospital admissions** | **Outpatient service** | | |
| **Carer support** | **Admission (circle)** | | |
| **Other reason (please give details below)** | **Respite / symptom control / terminal care** | | |
| **Hospital at Home** | | | |

**Service requested**

**The patient is currently**
- **At Home** | | |
- **In Hospital (see over)** | | |
- **Other e.g. Nursing Home** | | |
- **Please specify** | | |
- **Does patient live alone?** Yes | No |

**Any access issues (e.g. key safe):**

- **MRS Status**
  - Positive
  - Negative
  - Not known
- **Any other communicable infection:**

**Special device in situ?** Yes | No | If yes, give details (e.g. trache / PEG / ICD / IPPV): ____________________________

**Referrer’s Name:** (please print) | **Contact number:** | **Bleep no.:**

**Hospital/Surgery:**

**IS REFERRAL URGENT (assess within 2 working days)?** Yes | No | If URGENT, PLEASE PHONE US FOR IMMEDIATE ADVICE

LCA Palliative Care Group Revised April 2014
Referral Form for SPC Community and Inpatient Units

<table>
<thead>
<tr>
<th>In-Patient details</th>
<th>Patient Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td>Direct Ward.</td>
</tr>
<tr>
<td>Key worker</td>
<td></td>
</tr>
<tr>
<td>Consultant</td>
<td></td>
</tr>
<tr>
<td>NHS No.</td>
<td></td>
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<tr>
<td>Telephone</td>
<td></td>
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<tr>
<td>Date of discharge</td>
<td></td>
</tr>
<tr>
<td>Is Palliative care team involved?</td>
<td>Yes □ No □</td>
</tr>
</tbody>
</table>

Brief History of diagnosis(es) and Key treatments

<table>
<thead>
<tr>
<th>Date</th>
<th>Progression of disease and investigations/treatment</th>
<th>Consultant and hospital</th>
</tr>
</thead>
<tbody>
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</table>

Current palliative care problems

1. □
2. □
3. □

Patient Mobility: Barriers: Nursing required? Yes □ No □

Any other comments/information (including preferences expressed about care or other psychosocial or spiritual issues)

Referrer’s expectation of current treatment (please circle) symptom control / life prolonging / curative

Prognosis: In your opinion, is the patient

- Stable? Yes □ No □
- Unstable? Yes □ No □
- Deteriorating? Yes □ No □
- Dying? Yes □ No □

Is death anticipated within: Months □ Weeks □ Days □

Patient on Coordinate My Care? Yes □ No □ Unknown □

On the GSF register? Yes □ No □ Unknown □

DNACPR in place? Yes □ No □

Past Medical and Psychiatric History

Current Medication

Known Drug Sensitivities/Allergies:
Yes □ No □

Details:

Insight: Has patient been told diagnosis? Yes □ No □

Does patient discuss the illness freely? Yes □ No □

Is the carer aware of patient’s diagnosis? Yes □ No □

Please ensure patients are aware information will be held on computer according to the Data Protection Act

Referrer’s signature: ____________________________
Name: (please print)
Job title: ____________________________
Contact number: ____________________________
Surgery or Hospital: ____________________________
Date: ____________________________

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