For rectal carcinomas extending into gynaecologic or genitourinary structures, the external iliac region should be added.

Nodal contouring:

A 7–8 mm margin in soft tissue around the external iliac vessels should be considered, but one should consider a larger (>10 mm) margin anterolaterally, especially if small vessels or nodes are identified in this area.

The final CTV is created by fusing the various CTVs as described above.

Boost volume:

Boost clinical target volumes extend to the entire mesorectum and presacral region at involved levels, including 2 cm cephalad and caudad in the mesorectum and 2 cm on the gross tumour within the anorectal canal.

Planning target volume (PTV):

The CTV to PTV margin should be determined according to institutional preferences and experience (0.7–1.0 cm), depending on whether image-guided radiation therapy is being utilized.

Normal structures:

1. Bladder
2. Bilateral femoral heads
3. Male external genitalia
4. Small and large bowel 1cm above and below the PTV

Dose prescriptions:

45 Gy in 25 fractions over 5 weeks; 1 fraction daily prescribed to the PTV.

A 5.4 Gy boost in 3 fractions is optional for certain postoperative cases.

(G) Conventional two-dimensional radiotherapy planning on a simulator

Patient positioning and immobilization: please refer to (A) and (B) above.

Planning:

1. Mark the anal verge/APR scar using a copper wire
2. The source-to-axis distance technique is preferred for planning
3. A four-field box technique is used
4. The borders are as below:

Anteroposterior/posteroanteriorportal:

Upper border: L5–S1 junction

Lower border: Lower border of the obturator foramen

Lateral borders: 1.5 cm margin on the pelvic brim

Lateral portal:

Upper border: L5–S1 junction

Lower border: Lower border of the obturator foramen

Posterior border: Include the sacral hollow

Anterior border: Posterior border of the pubic symphysis

Corner shielding may be performed to save the bowel.

Dose prescription:

45 Gy in 25 fractions over 5 weeks; 1 fraction daily prescribed to the isocentre.

A 5.4 Gy boost in 3 fractions is optional for certain postoperative cases.

(H) Palliative radiation therapy planning for the pelvis:

Planning:

1. Mark the lower most extent of disease using a copper wire
2. The source-to-axis distance technique is preferred for planning
3. A two-field technique is used
4. The borders are as below:

Anteroposterior/posteroanteriorportal:

Upper border: L5–S1 junction

Lower border: Lower border of the obturator foramen

Lateral borders: 1.5-cm margin on the pelvic brim

Dose prescription:

20 Gy in 5 fractions or 30 Gy in 10 fractions; 1 fraction daily prescribed to the isocentre.

Support: Dr Vinay Gaikwad, Dr Santhosh Kumar D, Dr Mary Ann Muckaden, and Dr Rajiv Sarin from Tata Memorial Centre, Mumbai, and Rohin Mittal and Gigi Varghese from Christian Medical College, Vellore

Appendix F: Performance Status

This is an assessment of overall fitness. It can be a useful guide regarding the ability to tolerate chemotherapy. The most commonly used scale is the Eastern Cooperative Oncology Group performance status:

0. Able to carry out all normal activity without restriction
1. Restricted in physically strenuous activity but ambulatory and able to carry out light work
2. Ambulatory and capable of all self-care, but unable to carry out work; active for more than 50% of waking hours
3. Capable only of limited self-care; confined to the bed or chair for more than 50% of waking hours
4. Completely disabled; cannot carry out any self-care; completely confined to the bed or chair

Clinical trials will usually have their own performance status criteria for patient entry. Otherwise, chemotherapy should normally only be considered in those patients with performance status 0, 1, or 2.

CHAPTER

12 ABBREVIATIONS

5-HT	5-Hydroxytryptamine receptors
AAR	Annual incidence rate
ACHm	Muscarinic acetylcholine receptors
APC	Adenoma tous polyposis coli
APR	Abdominoperineal resection
AR	Anterior resection
ASA	American Society of Anaesthesiologists
ASCO	American Society of Clinical Oncology
BD	Twice a day
BRAF	Proto-oncogene encoding the protein B-raf
CA19.9	Carbohydrate antigen 19.9
CAP	Chest abdomen pelvis
CAPEOX	Capecitabine and oxaliplatin
CAPIRI	Capecitabine and irinotecan
CEA	Carcinoembryonic antigen
CLM	Colorectal liver metastasis
CT	Computed tomography
CECT	Contrast-enhanced computed tomography
CRC	Colorectal cancer
CRM	Circumferential resection margin
CTRT	Chemo-radiotherapy
CTV	Clinical target volume
D2	Dopamine receptor
DR	Dose reduction
dMMR	Deficient mismatch repair
DRE	Digital rectal examination
EUS	Endoscopic ultrasonography
5-FU	5-Fluorouracil
FA	Folinic acid
FAP	Familial adenomatous polyposis
FLR	Future liver remnant
FNA	Fine needle aspiration
FOLFOX	5-Fluourouracil, leucovorin, and oxaliplatin
FOLFIRI	5-Fluourouracil, leucovorin, and irinotecan
GABA	Gamma-aminobutyric acid receptor
Gy	Gray

H1	Histamine 1
HNPCC	Hereditary non-polyposis colon cancer
ICMR	Indian Council of Medical Research
IHC	Immunohistochemistry
IV	Intravenous
KRAS	Kirsten-ras oncogene homolog from mammalian ras gene family
LAR	Low anterior resection
LN	Lymph node
LV	Leucovorin
mCRC	Metastatic colorectal cancer
MDT	Multidisciplinary team
MLH1	MutL homolog1 gene
MMR	Mismatch repair
MRI	Magnetic resonance imaging
MSI	Microsatellite instability
NACT	Neoadjuvant chemotherapy
NACTRT	Neoadjuvant chemo-radiotherapy
NCI CTC	National Cancer Institute Common Toxicity Criteria for Adverse Events
NPS	Non-peritonealised surface
OD	Once a day
PET	Positron emission tomography
PO	Per oral
PPI	Proton pump inhibitor
PR	Per rectum
PTV	Planning target volume
QDS	Four times a day
RFA	Radiofrequency ablation
RT	Radiotherapy
SC	Subcutaneous
SCPRT	Short-course preoperative radiotherapy
TDS	Thrice a day
TEMS	Transanal endoscopic microsurgery
TME	Total mesorectal excision
TRG	Tumour regression grade
US	Ultrasonography
WHO	World Health Organisation

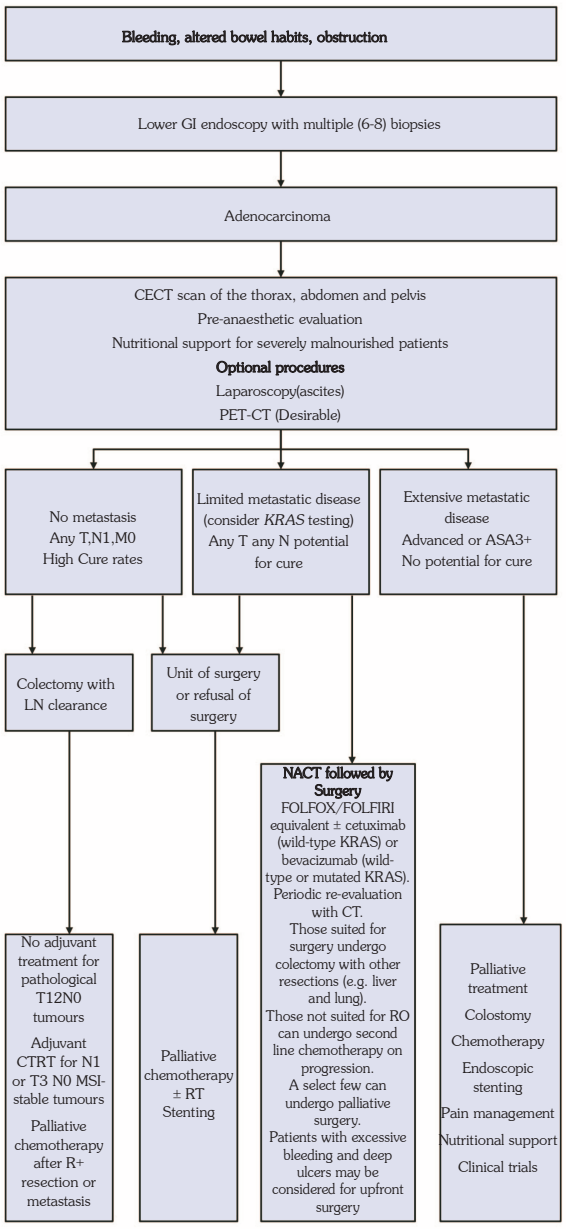
Desirable/Ideal: Tests and treatments that may not be available at all centres but the centres should aspire to have them in near future.

Essential: Bare minimum that should be offered to all the patients by all centres treating patients with cancer.

CHAPTER

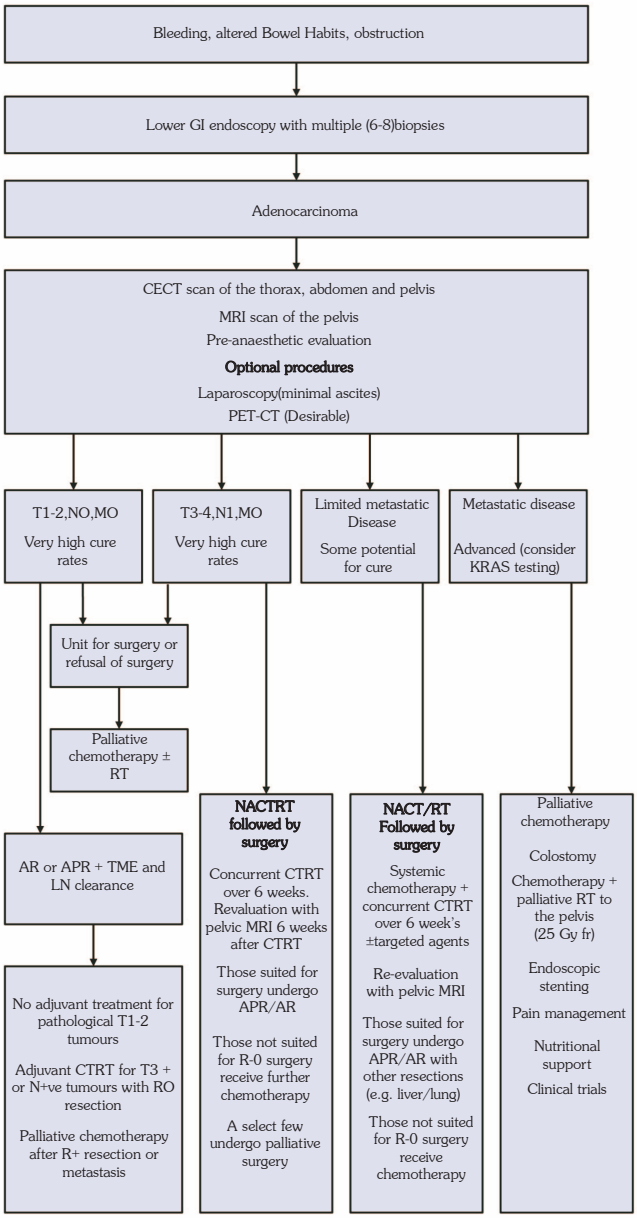
13 ALGORITHMS FOR COLON AND RECTAL CANCER

COLON CANCER



GI, gastrointestinal tract; CECT, contrast enhanced computed tomography; LN, Lymph node; CTRT, chemoradiotherapy; MSI, microsatellite instability RT, radiotherapy; KRAS, Kirsten ras -oncogene homolog from mammalian ras gene family NACT, neoadjuvant chemotherapy; FOLFOX, 5-fluorouracil leucovorin and oxaliplatin ; FOLFIRI, 5- fluorouracil leucovorin and irinotecan; CT-Computed tomography; ASA3, American society of Anesthesiologists 3

RECTAL CANCER



GI, gastrointestinal tract; CECT, contrast enhanced computed tomography; MRI, magnetic resonance imaging; AR, anterior resection; APR, abdominoperineal resection; TME, total mesorectal excision; LN, Lymph node; CTRT, chemoradiotherapy; RT, radiotherapy; NACTRT, neoadjuvant chemoradiotherapy; NACT neoadjuvant chemotherapy; KRAS, Kirsten ras -oncogene homolog from mammalian ras gene family

CHAPTER

14 SUMMARY

This consensus statement may be used as framework for more focused and planned research programmes to carry forward the process. The aim of the Indian Council of Medical Research Guidelines is to assist oncologists in making major clinical decisions encountered while managing their patients, while realizing the fact that some patients may require treatment strategies other than those suggested in these guidelines.

- Pattern of genomic alterations in colon and rectal tumours are similar, and hence, can be grouped together.
- Histological confirmation is mandatory prior to the commencement of definitive treatment.
- All patients should be staged according to the TNM staging system and risk should be assessed at diagnosis. A baseline contrast-enhanced computed tomography (CT) scan of the chest, abdomen, and pelvis should be considered.
- Select cases should be referred to genetics clinics as described.
- Patients should receive multidisciplinary care under the care of a surgical, medical, and radiation oncologist.
- Colon cancer (tumours lying above the peritoneal reflection):Primary surgery remains the standard of care. The need for adjuvant chemotherapy should be determined on an individual basis. The option of observation alone versus chemotherapy should be discussed with the patient.
- Rectal cancer: Neoadjuvant chemo-radiotherapy (NACTRT) should be strongly considered for locally advanced but resectable tumours for disease downstaging and organ preservation.
- *RAS* mutation testing may be performed for all patients with metastatic disease (desirable).
- Patients with liver-limited colorectal metastases should be referred early to a hepato-biliary surgeon to assess resectability.
- First-line chemotherapy for metastatic colorectal cancer (CRC):

5-Fluourouracil (5-FU), leucovorin (LV), and oxaliplatin (FOLFOX) as first-line treatment followed by single-agent irinotecan as second-line treatment

or

FOLFOX as first-line treatment followed by 5-FU, LV, and irinotecan (FOLFIRI) as second-line treatment or

Capecitabine and oxaliplatin (CAPEOX) as first-line treatment followed by FOLFIRI as second-line treatment

FOLFIRI or capecitabine and irinotecan (CAPIRI) may also be given as first-line therapy

- Targeted therapy (cetuximab and bevacizumab) may be considered in select patients.
- Patients should be offered regular surveillance after completion of curative resection or treatment of advanced disease.
- Participation in clinical trials should be encouraged.
- Referral for early palliative care should be made if indicated.