Colorectal Cancer Gross Examination: Standard Operating Procedure

NOTE: This protocol should be reviewed in conjunction with the illustrated guide entitled "Rectal Cancer Grossing Guideline.pdf".

Preliminary Procedures

Colon cancers:

Open entire specimen, including terminal ileum if present.
Gently wash out fecal material.
Ensure that specimen is immersed in an adequate volume of clean (non-bloody/contaminated) formalin; dirty formalin may need to be changed.
Ensure that the tumour will be adequately exposed to formalin; use gauze wicks if necessary to help achieve this, or pin on a board.
Measure the distance of tumor(s) from the proximal and distal margins in the fresh state if possible.

Rectal cancers:

Identify anatomical landmarks and location of tumour (by palpation).
The peritoneal reflection is low on the anterior aspect but high on the posterior aspect; the non-peritonealized tissue distal to the reflection is the radial resection margin.
Note that tumours in the upper/proximal rectum will have a serosal covering anteriorly and a radial margin posteriorly; mid to low/distal rectal tumors have a circumferential radial resection margin.
The quality of the mesorectal excision must be assessed prior to inking and sectioning. Three parameters must be assessed: the bulk of the mesorectum, the presence and depth of any defects in the mesorectum, and the presence or absence of coning – as follows:

Mesorectum	Defects	Coning
intact, smooth	no deeper than 5 mm	none
moderate bulk, irregular	no visible muscularis propria (except where levator muscles insert)	moderate
little bulk	down to muscularis propria	moderate-marked

Record this assessment on the synoptic sheet and append to the requisition (see following section for criteria for final assessment of TME quality).
Measure the distance of tumor(s) from the proximal and distal margins in the fresh state if possible.
Paint the bare area below the peritoneal reflection (black ink - posterior; green ink - anterior).
Open the specimen along the anterior aspect from the top and the bottom, leaving the bowel intact at a level just above and just below the tumour.
Place loose gauze (not paper towel) wicks – soaked in formalin – into the unopened ends of the bowel.
Fix all rectal cancer specimens for 96 hours (i.e. 4 days) in an adequate volume of clean (non-bloody/contaminated) formalin; dirty formalin may need to be changed.

Notes for examination

Review relevant clinical and radiologic data prior to sectioning.

Colon:

Photograph any unusual features.
Identify whether a colonic radial resection margin is present. Radial margins (an identifiable bare area) are usually present in the proximal ascending colon and the descending colon. Ink these areas with black ink.
Identify whether there is tumour close to or extending through a serosal surface. Suspicious areas are those areas of serosa that are roughened, granular or appear hypervascular.
Paint any suspicious serosal area with blue ink.
All lymph nodes must be found. This is best achieved by removing the fat close to the bowel wall and then using inspection and palpation to identify nodes. It is important to examine the fat that remains adhered to the bowel wall as this is often a location for small nodes.

Rectum:

Photograph the specimen: Either routine photography of anterior, posterior and lateral aspects in all cases, or photography of cases with decreased mesorectal bulk, defects > 5 mm or significant coning, is helpful for correlation with MRI.
Slice through the unopened bowel at 3-5 mm intervals and lay slices down on the work surface.
Inspect slices to note:

- CRM (circumferential radial margin): smooth, regular vs. moderately irregular vs. very irregular
- extent of tumour and the closest distance of tumour to the CRM
- obviously positive nodes and the distance of any positive node to the CRM
- record whether the closest tumour to CRM is anterior, posterior, or lateral

- examine fat away from tumour for lymph nodes
- photograph slices after ensuring that anterior, posterior, left, right, proximal and distal orientation is clearly evident (for MRI correlation)Inspect bowel away from tumour for polyps and other lesions.

Criteria for TME assessment:

The specimen is scored according to the worst area.

Incomplete	Nearly Complete	Complete
Little bulk to the mesorectum Defects in the mesorectum down to the muscularis propria After transverse sectioning, the circumferential margin appears very irregular	Moderate bulk to the mesorectum Irregularity of the mesorectal surface with defects greater than 5 mm, but none extending to the muscularis propria No areas of visibility of the muscularis propria except at the insertion site of the levator ani muscles	Intact bulky mesorectum with a smooth surface Only minor irregularities of the mesorectal surface No surface defects greater than 5 mm in depth No coning toward the distal margin of the specimen After transverse sectioning, the circumferential margin appears smooth

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Case Number: ____________________ **Specimen prepared by:** ________ **Date:** __________ **Time:** __________

Specimen grossed by: ________ **Date:** __________ **Time:** __________

Gross Description	
1. Type & Size *(choose one of the 4 specimen types)*	☐ Right hemicolectomy specimen including: ☐ terminal ileum (_ cm length, _ cm circumference proximal margin, _ cm circumference distal margin) ☐ appendix (_ cm length, _ cm greatest diameter) ☐ colon (_ cm length, _ cm circumference proximal margin, _ cm circumference distal margin) ☐ pericolic soft tissue _ cm in depth -- ☐ Segmental colectomy specimen: ☐ colon (_ cm length, _ cm circumference proximal margin, _ cm circumference distal margin) ☐ pericolic soft tissue _ cm in depth -- ☐ Rectosigmoid resection specimen: ☐ sigmoid colon and rectum (_ cm length, _ cm circumference proximal margin, _ cm circumference distal margin) ☐ pericolic/rectal soft tissue _ cm in depth -- ☐ Rectal resection specimen ☐ Abdominoperineal resection specimen *(check one or the other)* _ cm length, _ cm circumference at proximal margin, _ cm circumference at distal margin Mesorectum: ☐ good bulk, intact with smooth surface ☐ moderate bulk, irregular ☐ little bulk, irregular Defects: ☐ none >5 mm ☐ >5 mm but no visible muscularis propria ☐ down to muscularis propria Coning: ☐ none ☐ moderate ☐ moderate-marked -- Describe any other organs/tissues present as appropriate, e.g. vagina, prostate, bladder etc.
2. Main Pathological Process	Number of tumours: Location: Configuration: ☐ polypoid ☐ ulcerated ☐ annular/circumferential ☐ *combination (describe)* Size: _ x _ cm (For rectal cancers, maximum size may be estimated as the tumour will not be measurable prior to sectioning) Distance from longitudinal margins: proximal _ cm; distal _ cm Extension into pericolic/perirectal tissue: ☐ yes ☐ no Extension into other organs or tissues: *(as appropriate)* Perforation: ☐ yes ☐ no Relationship of tumour to posterior peritoneal reflection (PPR): ☐ entirely above PPR ☐ traversing PPR ☐ entirely below PPR Serosa underlying tumour: ☐ unremarkable ☐ puckered ☐ granular ☐ fibrous adhesions ☐ not applicable Distance of tumour to closest serosa: _ cm *(NB: serosal surface present in all colon and upper rectal cancers)* Radial margin *For colon cancers:* ☐ true radial margin, posterior bare area present *(look for in ascending, descending colon cancers)* ☐ mesenteric only Closest distance to radial/mesenteric margin: _ cm -- *For rectal cancers:* Closest distance to radial margin: _ cm Location of closest radial margin: ☐ anterior ☐ posterior ☐ lateral Appearance of radial margin: ☐ smooth ☐ regular ☐ moderately irregular ☐ very irregular
3. Secondary Findings *(check all that apply)*	Lesions in non-tumoural mucosa: ☐ none ☐ polyps *(provide size range and location)* ☐ diverticula ☐ *other (describe)*

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4. Special Studies	*As appropriate*

5. Ink Code *(check all that apply)*	☐ colon radial margin: **black** ☐ rectal posterior radial margin: **black** ☐ rectal anterior radial margin: **green** ☐ serosal surface: **blue**

6. Section Code	**<u>At least</u> 4** blocks of tumour, to include: ▪ Deepest point of invasion (2 blocks). *[Note: If there are foci showing spicules of fibrosis radiating outward at the deep aspect, these should be sampled].* ▪ Relationship to radial margin (2 blocks). *[Note: These may be the same as sections showing deepest invasion].* ▪ Relationship to serosa (for colon tumours) (2 blocks) *[For rectal tumours that straddle the peritoneal reflection, the serosa above the peritoneal reflection and the radial margin below the reflection must be sampled.]* ▪ Interface with uninvolved bowel (1 block). ▪ Relationship with other organs (if appropriate). ▪ Entire abnormal area in post-treatment rectal tumours if little or no tumour apparent. ▪ One section from each longitudinal margin. ▪ Polyps: If <5: submit all; if 5 or more: section the largest 5. *[In general, one section from polyps <1 cm, 2 or more sections from larger polyps].* ▪ All lymph nodes *[Must be submitted in their entirety; it must be noted in the gross description whether nodes are bisected or trisected in one block or if more than one block represents a single large node.]*