Guidelines for Colonoscopy Surveillance After Colorectal Cancer Resection: Recommendations of the US Multi-Society Task Force on Colorectal Cancer

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The US Multi-Society Task Force has developed updated recommendations to guide health care providers with the surveillance of patients after colorectal cancer (CRC) resection with curative intent. This document is based on a critical review of the literature regarding the role of colonoscopy, flexible sigmoidoscopy, endoscopic ultrasound, fecal testing and CT colonography in this setting. The document addresses the effect of surveillance, with focus on colonoscopy, on patient survival after CRC resection, the appropriate use and timing of colonoscopy for perioperative clearing and for postoperative prevention of metachronous CRC, specific considerations for the detection of local recurrence in the case of rectal cancer, as well as the place of CT colonography and fecal tests in post-CRC surveillance.

Abbreviations used in this paper: CEA, carcinoembryonic antigen; CI, confidence interval; CRC, colorectal cancer; CT, computed tomography; CTC, computed tomographic colono- graphy; EUS, endoscopic ultrasound; FIT, fecal immunochemi- cal test; GRADE, Grading of Recommendations Assessment, Development and Evaluation; OR, odds ratio; RCT, rand- omized controlled trial; RR, relative risk; SPS, serrated polypo- sis syndrome; USMSTF, US Multi-Society Task Force.

Introduction

In the United States, colorectal cancer (CRC) is the second leading cause of cancer deaths for men and women combined (1). Of the estimated 132,700 new cases expected to be diagnosed in 2015 (1), 70–80% will undergo surgical resection with curative intent (2,3) and up to 40% of patients with locoregional disease will develop recurrent cancer, of which 90% will occur within 5 years (4). The postoperative surveillance of patients treated for CRC is intended to prolong survival by diagnosing recurrent and metachronous cancers at a curable stage, and to prevent metachronous cancer by detection and removal of precancerous polyps.

Surveillance strategies employ a combination of modalities, including history and physical examination, carcinoembryonic antigen (CEA), computed tomography (CT) scans, and endoluminal imaging, including colonoscopy, sigmoidoscopy, endoscopic ultrasound (EUS), and CT colonography (CTC). Although the optimal surveillance strategy is still not clearly defined, the role of colonoscopy is primarily to clear the colon of synchronous cancers and polyps and prevent metachronous neoplasms.

In 2006, the US Multi-Society Task Force (USMSTF) published a consensus guideline to address the use of endoscopy for patients after CRC resection (5). This updated document focuses on the role of colonoscopy in patients after CRC resection. Additionally, based on a comprehensive literature review updated from the 2006 recommendations, we review the possible adjunctive roles of fecal testing (e.g., fecal immunochemical testing for hemoglobin) and CTC. The use of CEA, CT scans of the liver, as

well as chest radiographs are beyond the scope of this document and are not reviewed. The goal of this consensus document is to provide a critical review of the literature and recommendations regarding the role of colonoscopy, flexible sigmoidoscopy, EUS, fecal testing, and CTC in surveillance after surgical resection of CRC.

Process and Levels of Evidence

The USMSTF includes gastroenterology experts with specific interest in CRC. These members represent the American College of Gastroenterology, the American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy. Summary tables and a draft document were circulated to members of the Task Force, and final guidelines were developed by consensus during a joint teleconference. The document underwent committee review and governing board approval by all 3 societies. The USMSTF grades the quality of evidence and strength of recommendations using an adaptation of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (9). The GRADE process categorizes the quality of the evidence as high, moderate, low, or very low (Table 1). This categorization is based on an assessment of the study design (e.g., randomized controlled trial or observational study), study limitations, inconsistency of results, indirectness of evidence, imprecision, and publication bias. The USMSTF members conduct literature searches to identify published papers that address the key issues discussed within these recommendations. These publications are supplemented both by review of citations from the identified papers as well as other key references elicited from the subject matter experts on the Task Force. The GRADE process involves the collection of literature, analysis, summary (often as meta-analysis), and a separate review of the quality of evidence and strength of recommendations. The USMSTF members employ a modified, qualitative approach for this assessment based on exhaustive and critical review of evidence, without a traditional meta-analysis. The GRADE process separates evaluation of the quality of the evidence to support a recommendation from the strength of that recommendation. This is done in recognition of the fact that, although the quality of the evidence impacts the strength of the recommendation, other factors can influence a recommendation, such as side effects, patient preferences, values, and cost. Strong recommendations mean that most informed patients would choose the recommended management and that clinicians can structure their interactions with patients accordingly. Weak recommendations mean that patients' choices will vary according to their values and preferences, and clinicians must ensure that patients' care is in keeping with their values and preferences (9). Weaker recommendations are indicated by phrases such as "we suggest," whereas stronger recommendations are stated as "we recommend."

Table 1. Grading of Recommendations Assessment, Development, and Evaluation Ratings of Evidence

Rating of evidence	**Definition**
High quality	Further research is very unlikely to change our confidence in the estimate of effect
Moderate quality	Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
Low quality	Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
Very low quality	Any estimate of effect is very uncertain

Recommendations	
Colonoscopy and Perioperative Clearing in Patients with Cancer of the Colon or Rectum	
1.	We recommend that patients with CRC undergo high-quality perioperative clearing with colonoscopy. The procedure should be performed preoperatively, or within a 3- to 6-month interval after surgery in the case of obstructive CRC. The goals of perioperative clearing colonoscopy are detection of synchronous cancer and detection and complete resection of precancerous polyps. (Strong recommendation, low-quality evidence).
Colonoscopy and Prevention of Metachronous Cancer After Surgery for Colon and for Rectal Cancer	
2.	We recommend that patients who have undergone curative resection of either colon or rectal cancer receive their first surveillance colonoscopy 1 year after surgery (or 1 year after the clearing perioperative colonoscopy). Additional surveillance recommendations apply to patients with rectal cancer (see "Additional Considerations in Surveillance of Rectal Cancer"). (Strong recommendation, low-quality evidence).
3.	We recommend that, after the 1-year colonoscopy, the interval to the next colonoscopy should be 3 years (i.e., 4 years after surgery or perioperative colonoscopy) and then 5 years (i.e., 9 years after surgery or perioperative colonoscopy). Subsequent colonoscopies should occur at 5-year intervals until the benefit of continued surveillance is outweighed by diminishing life expectancy. If neo-plastic polyps are detected, the intervals between colonoscopies should be in accordance with published guidelines for polyp surveillance intervals. These intervals do not apply to patients with Lynch syndrome. (Strong recommendation, low-quality evidence).
Additional Considerations in Surveillance of Rectal Cancer	
4.	Patients with localized rectal cancer who have undergone surgery without total mesorectal excision, those who have undergone transanal local excision (i.e., transanal excision or transanal endoscopic microsurgery), or endoscopic submucosal dissection, and those with locally advanced rectal cancer who did not receive neoadjuvant chemoradiation and then surgery using total mesorectal excision techniques, are at increased risk for local recurrence. In these situations, we suggest local surveillance with flexible sigmoidoscopy or EUS every 3–6 months for the first 2–3 years after surgery. These surveillance measures are in addition to recommended colonoscopic surveillance for metachronous neoplasia. (Weak recommendation, low-quality evidence).
5.	In patients with obstructive CRC precluding complete colonoscopy, we recommend CTC as the best alternative to exclude synchronous neoplasms. Double-contrast barium enema is an acceptable alternative if CTC is not available. (Strong recommendation, moderate-quality evidence).
6.	There is insufficient evidence to recommend routine use of FIT or fecal DNA for surveillance after CRC resection.

Appendix

Summary of Recommendations

We recommend that patients with CRC undergo high-quality perioperative clearing with colonoscopy. The procedure should be performed preoperatively or within a 3- to 6-month interval after surgery in the case of obstructive CRC. The goals of perioperative clearing colonoscopy are detection of synchronous cancer and detection and complete resection of precancerous polyps. We recommend that patients who have undergone curative resection of either colon or rectal cancer receive their first surveillance colonoscopy 1 year after surgery (or 1 year after the clearing perioperative colonoscopy).

Additional surveillance recommendations apply to patients with rectal cancer (see “Additional Considerations in Surveillance of Rectal Cancer”). We recommend that, after the 1-year colonoscopy, the interval to the next colonoscopy should be 3 years (i.e., 4 years after surgery or perioperative colonoscopy), and then 5 years (i.e., 9 years after surgery or perioperative colonoscopy). Subsequent colonoscopies should occur at 5-year intervals, until the benefit of continued surveillance is outweighed by diminishing life expectancy. If neoplastic polyps are detected, the intervals between colonoscopies should be in accordance with the published guidelines for polyp surveillance intervals. These intervals do not apply to patients with Lynch syndrome. Patients with localized rectal cancer who have undergone surgery without total mesorectal excision, those who have undergone transanal local excision (transanal excision or transanal endoscopic microsurgery) or endoscopic submucosal dissection, and those with locally advanced rectal cancer who did not receive neoadjuvant chemoradiation and then surgery using total mesorectal excision techniques are at increased risk for local recurrence. In these situations, we suggest local surveillance with flexible sigmoidoscopy or EUS every 3–6 months for the first 2–3 years after surgery. These surveillance measures are in addition to recommended colonoscopic surveillance for metachronous neoplasia. In patients with obstructive CRC precluding complete colonoscopy, we recommend CTC as the best alternative to exclude synchronous neoplasms. Double-contrast barium enema is an acceptable alternative if CTC is not available. There is insufficient evidence to recommend the routine use of FIT or fecal DNA for surveillance after CRC resection.