

Colorectal Cancer Surveillance: 2005 Update of an American Society of Clinical Oncology Practice Guideline

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Approved by the Board on August 9, 2005.

Authors' disclosures of potential conflicts of interest are found at the end of this article.

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0732-183X/05/2333-8512/\$20.00

DOI: 10.1200/JCO.2005.04.0063

A B S T R A C T

Purpose

To update the 2000 American Society of Clinical Oncology guideline on colorectal cancer surveillance.

Recommendations

Based on results from three independently reported meta-analyses of randomized controlled trials that compared low-intensity and high-intensity programs of colorectal cancer surveillance, and on recent analyses of data from major clinical trials in colon and rectal cancer, the Panel recommends annual computed tomography (CT) of the chest and abdomen for 3 years after primary therapy for patients who are at higher risk of recurrence and who could be candidates for curative-intent surgery; pelvic CT scan for rectal cancer surveillance, especially for patients with several poor prognostic factors, including those who have not been treated with radiation; colonoscopy at 3 years after operative treatment, and, if results are normal, every 5 years thereafter; flexible proctosigmoidoscopy every 6 months for 5 years for rectal cancer patients who have not been treated with pelvic radiation; history and physical examination every 3 to 6 months for the first 3 years, every 6 months during years 4 and 5, and subsequently at the discretion of the physician; and carcinoembryonic antigen every 3 months postoperatively for at least 3 years after diagnosis, if the patient is a candidate for surgery or systemic therapy. Chest x-rays, CBCs, and liver function tests are not recommended, and molecular or cellular markers should not influence the surveillance strategy based on available evidence.

J Clin Oncol 23:8512-8519. © 2005 by American Society of Clinical Oncology

INTRODUCTION

The American Society of Clinical Oncology (ASCO) published an update of the clinical practice guidelines on colorectal cancer surveillance in 2000. ASCO updates a guideline when data or publications might change a prior recommendation or when the Panel feels clarifications are required for the oncology community.

A subset of the original Expert Panel met in June 2004 and May 2005 to consider the evidence for each of the recommendations from 2000. Additional meetings were

conducted via teleconference. The guideline update was circulated in draft form to the full Expert Panel for review and approval. These recommendations represent the Panel's attempt to extract practical guidelines from a combination of published evidence and expert opinion where the literature falls short.

Update Methodology

For the 2005 update, the Expert Panel completed the review and analysis of data published since 1999. Computerized literature searches of MEDLINE and the Cochrane Collaboration Library were performed. The

searches of the English-language literature from 1999 to June 2005 combined the terms “colonic neoplasms,” “colorectal neoplasms,” and “rectal neoplasms,” with the MeSH term, “follow-up studies” and the text words “surveillance” and “follow-up.” The set of articles yielded from this initial search was supplemented by articles identified from searches on each of the tests or procedures addressed in the original guideline (eg, history and physical examination, liver function tests, carcinoembryonic antigen), in combination with “surveillance,” “follow-up studies,” and “follow-up.” Supplementary searches were done to address positron emission tomography and magnetic resonance imaging. The searches were limited to human-only studies and to specific study design or publication type: randomized clinical trial, meta-analysis, practice guideline, systematic overview, or systematic review. The literature review centered on randomized clinical trials, and meta-analyses of data from randomized clinical trials.

The updated review reflects evidence on both specific methods of surveillance and risk stratification. There have been three recent, independently reported, meta-analyses,¹⁻³ all of which have evaluated either five or six of the randomized trials that compared low-intensity and high-intensity programs of surveillance for patients after curative-intent surgery for adenocarcinoma of the colon and rectum.⁴⁻⁹ The individual randomized trials differed in the actual tests that were evaluated and the interval between tests, representing discrepancies that were mentioned in the previous update of this guideline.¹⁰

Further, the Panel considered recent analyses of data from major clinical trials in colon and rectal cancer. These analyses provide indirect empirical guidance to inform recommendations related to risk assessment in colorectal surveillance, and to support recommendations relating to the schedule of clinical visits and the frequency of specific tests. Two major pooled analyses of data from colon cancer clinical trials,^{11,12} and the final analysis of an Intergroup clinical trial in rectal cancer were identified as relevant.¹³

The 2005 guidelines are now organized to provide recommendations for the stage II or III colon cancer patient. Aside from endoscopic follow-up, this guideline does not apply to patients with stage I colorectal cancer, where the

risk of recurrence is very low. Where follow-up strategies for rectal cancer should differ from colon cancer, specific recommendations for those deviations are provided. In addition, the guideline has organized the recommendations into five broad categories: (1) history and physical examination and risk assessment; (2) laboratory tests; (3) imaging procedures; (4) endoscopic surveillance techniques; and (5) a new category of laboratory-based prognostic and predictive factors.

Summary of Literature Review Results

Since data show that some patients with colorectal cancer are cured following the resection of metastatic disease, several clinical trials have been performed examining the usefulness of various surveillance strategies and tests. At least one article noted substantial advances in survival and resectability during the last 30 years, supporting more aggressive follow-up after diagnosis and treatment.¹⁴

The Expert Panel did not complete an independent meta-analysis of the data from available randomized clinical trials given the availability of three high-quality and recent meta-analyses identified through the literature search.¹⁻³ (The quality of the three meta-analyses was evaluated using the Oxman-Guyatt Overview Quality Assessment Questionnaire for assessing the quality of systematic reviews and meta-analyses. All three meta-analyses had “minimal flaws,” the highest quality rating within this system.)¹⁵ These meta-analyses report a 20% to 33% reduction in risk of death from all causes for those individuals who received more intensive follow-up (the absolute risk difference was 7%; Table 1). Table 2 summarizes the testing strategies and results of the low- and high-intensity strategies by individual study. In the trials, only two of the six randomized studies suggested significant improvement in survival for those receiving intensive follow-up.^{5,9} In addition, those with more intensive surveillance had earlier documentation of recurrences, though the number of recurrences was similar comparing the control and intensive surveillance groups. Patients with more intensive surveillance were more likely to have surgery for metastatic or recurrent disease with curative intent.

Table 1. Results of Meta-Analyses of Colorectal Cancer Post-Treatment Surveillance Randomized Clinical Trials

Meta-Analysis	No. of Articles Analyzed	Pooled No. of Patients Across Trials		Pooled 5-Year Mortality Rate				Absolute Risk Difference		Effect on 5-Year Mortality		
		Control	Intervention	Control		Intervention		%	95% CI	95% CI	P	
				No. of Patients	%	No. of Patients	%					
Figueredo et al ¹	6 ⁴⁻⁹	821	858	37	306 of 821	30	260 of 858	7	3 to 12	Relative risk = 0.80	0.70 to 0.91	.0008
Renehan et al ²	5 ⁴⁻⁸	676	666	37	247 of 666	30	197 of 676	7	2 to 12	Relative risk = 0.81	0.70 to 0.94	.007
Jeffery et al ³	5 ⁴⁻⁸	676	666	37	247 of 666	30	197 of 676	7	2 to 12	Odds ratio = 0.67*	0.53 to 0.84	

*This odds ratio of 0.67 is equivalent to a relative risk of 0.81 for these data.

Table 2. Summary of Randomized Trials of Follow-Up in Colorectal Cancer After Resection

Study	Location (years)	Follow-Up Program and Outcomes		5-Year Survival Rate (%)	
		Control	Intervention	Less Intensity	More Intensity
Makela ⁸	Finland (1988-90)	Regular (n = 54): Clinical assessment, blood counts and CEA, chest x-ray, and FOB every 3 mo for 2 yr, then every 6 mo for next 3 yr; rigid sigmoidoscopy for rectosigmoid tumors at each visit, and yearly barium enema for all patients. 5 yr S = 54%	Intensive (n = 52): Clinical assessment, blood counts and CEA, chest x-ray and FOB as in regular follow-up program. In addition, colonoscopy at 3 mo if not performed preoperatively and then yearly thereafter on all patients, flexible sigmoidoscopy for rectosigmoid tumors every 3 mo, liver ultrasound every 6 mo, and yearly CT of liver and site of operation. 5 yr S = 59%	54	59
Ohlsson ⁷	Sweden (1983-86)	Minimal (n = 54): FOB every 3 mo for 2 yr, then yearly, and to consult for a list of symptoms. 5 yr S = 67%	Regular (n = 53): Clinical assessments, blood CEA and liver enzyme, chest x-ray, FOB and rigid sigmoidoscopy every 3 mo for 2 yr, then every 6 mo; endoscopy control anastomosis by flexible endoscopy at 9, 21, and 42 mo; complete colonoscopy at 3, 15, 30, and 60 mo; CT of pelvis (if they had abdominoperineal resection) at 3, 6, 12, 18, and 24 mo. 5 yr S = 75%	67	75
Kjeldsen ⁶	Denmark (1985-94)	Minimal (n = 307): Clinical assessment, blood hemoglobin, sedimentation rate and liver enzymes, chest x-ray, FOB, and colonoscopy (if incomplete, double contrast barium enema) at 5, 10, and 15 yr. 5 yr S = 68%	Regular (n = 290): Same tests as minimal follow-up program, but tests were conducted every 6 mo for 3 yr, and then at 4, 5, 7.5, 12.5, and 15 yr. 5 yr S = 70%	68	70
Schoemaker ⁴	Australia (1984-90)	Minimal (n = 158): Clinical assessment, blood counts, CEA, liver function tests and FOB every 3 mo for 2 yr, then every 6 mo for 5 yr; chest x-rays, liver CT scan and colonoscopy at 5 yr. 5 yr S = 70%	Regular (n = 167): Clinical assessment, blood counts, CEA, liver function tests and FOB as in regular follow-up program. In addition, chest x-rays, liver CT scan and colonoscopy annually. Isolated increase in CEA levels did not trigger further investigations. 5 yr S = 76%	70	76
Pietra ⁵	Italy (1987-90)	Regular (n = 103): Clinical assessment, CEA and liver ultrasound every 6 mo for one year, then yearly; chest x-ray and colonoscopy yearly. 5 yr S = 58%	Intensive (n = 104): Clinical assessment, CEA, and liver ultrasound as regular follow-up program, but tests conducted every 3 mo for 2 yr, then every 6 mo for 3 yr, and yearly thereafter. In addition, chest x-ray, abdominal CT and colonoscopy yearly. 5 yr S = 73%	58	73*
Secco ⁹	Italy (1988-96)	Minimal (n = 145): Patients to phone the surgical team every 6 mo. Clinical assessment by family physician at least once a year or when suggestive symptoms of recurrence occurred. 5 yr S = 48%	Intensive (n = 192) High-Risk Patients: Clinical assessment and CEA every 3 mo for 2 yr, every 4 mo in the third year and every 6 mo in years 4 and 5. Abdominal and pelvic ultrasound performed every 6 mo the first 3 yr and yearly in years 4 and 5. Rigid recto-sigmoidoscopy and chest x-ray yearly for patients with rectal cancer. Low-Risk Patients: Clinical assessment and CEA every 6 mo for 2 yr, then yearly; abdominal and pelvic ultrasound every 6 mo for 2 yr, then once a year. Rigid recto-sigmoidoscopy for rectal cancer yearly twice, then every 2 yr and chest x-ray yearly. 5 yr S = 63%	48	63

NOTE. Adapted with permission from the Program in Evidence-Based Care, Cancer Care Ontario (CCOPEBC, 2005, Report Number 2-9, Tables 3 and 4, available at <http://www.cancercare.on.ca>).¹
Abbreviations: CEA, carcinoembryonic antigen; FOB, fecal occult blood; mo, months; yr, years; S, survival; CT, computerized tomography.
* $P < .05$

In light of multiple corroborating studies showing a survival benefit to more intensive surveillance, the Expert Panel changed several guideline recommendations, as noted below. Following each recommendation, a more specific discussion of the rationale for each issue follows in the update sections.³

ASCO COLORECTAL CANCER FOLLOW-UP GUIDELINES

1. History and Physical Examination and Risk Assessment

Current recommendation. Coordinating physician visits should occur every 3 to 6 months for the first 3 years,

every 6 months during years 4 and 5, and subsequently at the discretion of the physician. Physician visits should focus on the initial risk assessment, followed by the implementation of a surveillance strategy and periodic counseling based on estimated risk and feasibility of surgical interventions like hepatic resection.

2005 literature update and discussion. The Panel acknowledges that the frequency, duration, and benefit of the follow-up visit itself have never been formally tested. Nevertheless, without periodic visits, the chance of detecting asymptomatic recurrences, communicating advances in genetic testing, and responding to queries within the purview of the specialist could never be done. Therefore, this discussion focuses on the interaction between the patient and doctor, the assessment of recurrence risk, as well as the system of care available to schedule and implement the plan.

While this recommendation does not represent a major departure from previous versions, the concept of a risk-based plan, and the tools to formulate it, have improved. A recently reported analysis of individual patient data from large adjuvant colon cancer randomized trials, including more than 12,915 patients, noted that 85% percent of colon cancer recurrences are diagnosed within the first 3 years after surgical resection of the primary tumor.¹² Thus, it is appropriate for the coordinating physician visits to occur every 3 to 6 months for the first 3 years after treatment, with decreased frequency thereafter for 2 years for colon cancer patients. These physician visits offer the opportunity to determine symptoms, to coordinate follow-up, and to offer counseling. Longer follow-up may be appropriate for locally advanced rectal cancer patients with poor prognostic factors based on data from two recent studies^{13,16} that showed continuing risk of recurrence after 5 years. After 5 years, the need for future tests and visits are left to the discretion of the patient and physician.

During the initial discussions between patient and physician to determine an agreed-upon surveillance strategy, risk assessment should be reviewed. Recent modifications of the TNM staging system for colorectal cancer^{17,18} were necessary to recognize the significant differences in survival for patients within a given stage subset. The survival difference resulting from easily measured clinical factors from several adjuvant chemotherapy trials, permitted the creation of a model able to estimate individual prognosis for individuals with stage II and III colon cancer.¹¹ Table 3 uses a Web-based adaptation of that model (available to all clinicians at <http://www.mayoclinic.com/calcs>)¹⁹ to estimate 5-year relapse-free survival both with and without treatment using data available on most pathology reports. While other Web-based predictive tools are available, all of them use a limited set of clinical factors to make predictions about outcome and treatment effect.²⁰

Table 3. Selected Prognostic Factors and Five-Year Relapse-Free Survival

Prognostic Factors*	5-Year Relapse-Free Survival (%)
T3N0 (11-20 nodes analyzed)	79
T3N0 low grade	73
T3N0 (\leq 10 lymph nodes examined)	72
T3N0 high grade	65
T4N0 low grade	60
T4N0 high grade	51
T3N1	49
T3N2	15

*Results were derived from the Mayo Clinic calculator (<http://www.mayoclinic.com/calcs>)¹⁹ using a referent age of 60-69 years old. Survival results did not consider treatment benefits; all stages in this table are M0. Data regarding numbers of lymph nodes analyzed came from Le Voyer et al.²¹

Other prognostic factors of proven importance include the number of lymph nodes that are harvested and processed for evaluation.^{21,22} A host of other pathologic factors may be important in defining prognosis, including blood or lymphatic vessel invasion, histologic grade, and perineural invasion as examples, which might be utilized to determine risk and associated surveillance strategy.²³ Currently, other than stage and subsets within a stage, there is no single pathologic feature or statistical model that can be used to build a surveillance strategy. This is analogous to treatment choice for patients with colon cancer in that currently there are no predictive markers that can be routinely used to define who is most likely to benefit from therapy. Nonetheless, it can be recommended that risk assessment should be discussed with the patient to formulate the surveillance strategy for that individual.

2. Laboratory Tests

Carcinoembryonic antigen: Current recommendation. Postoperative serum CEA testing should be performed every 3 months in patients with stage II or III disease for at least 3 years after diagnosis, if the patient is a candidate for surgery or systemic therapy. (Note: Adapted from the 2005 ASCO Clinical Practice Guidelines for the Use of Tumor Markers in Gastrointestinal Cancer). Since fluorouracil-based therapy may falsely elevate CEA values²⁴ waiting until adjuvant treatment is finished to initiate surveillance is advised.

Carcinoembryonic antigen: 2005 literature update and discussion. ASCO's Gastrointestinal Cancer Tumor Markers Panel will publish the rationale for this guideline (American Society of Clinical Oncology: Guideline recommendations for the use of tumor markers in gastrointestinal cancer [submitted]). The current Panel modified the frequency slightly to correspond with the suggested frequency of visits and tests.

Blood tests: Current recommendation. No change from the last update of the guideline. Routine blood tests (ie, CBCs or liver function tests) are not recommended.

Blood tests: 2005 Literature update. No relevant studies were identified from the review of the literature conducted for the update for CBCs or liver function tests.

Fecal occult blood test: Current recommendation. No change from the last update of the guideline. Periodic fecal occult blood testing is not recommended.

Fecal occult blood test: 2005 literature update. No relevant studies were identified from the review of the literature conducted for the update for fecal occult blood testing.

3. Imaging Procedures

Computed tomography (CT) in colon and rectal cancer surveillance: Current recommendation. Patients who are at higher risk of recurrence, and who could be candidates for curative-intent surgery, should undergo annual CT of the chest and abdomen for 3 years after primary therapy for colon and rectal cancer. A pelvic CT scan should be considered for rectal cancer surveillance, especially for patients who have not been treated with radiotherapy.

Computed tomography in colon and rectal cancer surveillance: 2005 Literature update and discussion. Prior ASCO guidelines recommended *against* CT scanning; accordingly, this update represents a significant change. The major reason why CT scanning is now recommended is that all three meta-analyses cited here in the Summary of Literature Review Results section, showed a survival benefit for CT scanning or "liver imaging." Specifically, there is a 25% lower mortality in patients undergoing liver imaging compared with nonimaging strategies. The benefit derives from the usefulness of liver resections for metastatic cancer of limited extent.

Corroborating these analyses is the recent publication by Chau et al.²⁵ These authors reported on the surveillance of 530 patients who participated in a randomized, adjuvant chemotherapy clinical trial for stage II and III colon cancer patients, who received CEA and CT scans of the chest, abdomen, and pelvis as a component of protocol-specific follow-up. A nearly identical number of relapses were detected by CEA (45 relapses) and CT scan (49 relapses), and 14 were detected by both tests. Compared with those whose

relapses were detected by symptoms (65) the CT-detected group had improved survival ($P = .0046$). Patients who were able to undergo potentially curative surgery had improved survival and were best detected by either CT scan (26.5%) or CEA (17.8%) compared with those with symptoms (3.1%, CT ν symptomatic, $P < .001$; CEA ν symptomatic, $P < .015$). For comparison, Table 4 shows guidelines developed by other groups regarding liver imaging.

The Panel acknowledges there is less evidence for chest CT surveillance compared with liver imaging. None of the meta-analyses addressed this test specifically. However, the chest CT was added for several reasons. First, while Chau's article shows the greatest number of recurrences was found for abdominal CT scanning, the largest proportion of *resectable* recurrences was found on the thoracic CT. Second, pulmonary recurrences were less likely to have elevated CEA tests. Third, lung recurrences were as common as liver relapse in rectal cancer patients and represented the largest proportion of resected metastases in the Intergroup 0114 trial.¹³ Finally, routine chest CT settled previous disagreements among the Panel members about routine chest x-rays.

The cost of adding CT scanning to recurrence surveillance is not insignificant; therefore, four qualifications are important. First, there are no data that specify the frequency of CT scanning. Annual studies for three years seem reasonable based on the Chau study,²⁵ although one-third of the recurrences that occurred in the first two years presented only with symptoms (despite yearly CT scanning and CEA testing every three months). Second, CT scanning should not be routinely ordered in patients who would or could not undergo curative liver or pulmonary resection. Third, while CT scans of the abdomen and pelvis are frequently ordered together, the data do not justify routine pelvic imaging. Very few patients in the two studies that addressed this issue had curative resection based findings from a screening pelvic CT scan, even for rectal cancer.⁵ However, the Panel felt (albeit without complete agreement) that a pelvic CT should be considered for rectal cancer patients with several negative prognostic factors, especially those patients who had not undergone radiation therapy.

Table 4. Liver Imaging Recommendations by Other Organizations

Organization	Test and Recommendation
ESMO: Colon Cancer ³²	Abdominal CT: restricted to patients with suspicious symptoms Abdominal ultrasound: every 6 months for 3 years then yearly for 2 years.
ESMO: Rectal cancer ³³	No imaging recommended
CCO ¹	Liver ultrasound or CT every 6 months for 3 years and then annually for 3 years
NCCN ³⁴	Abdominal CT scan for patients at high risk defined as poorly differentiated cancers or those with perineural or venous involvement (no frequency)
ASCRS ³⁵	No imaging studies recommended

Abbreviations: ESMO, European Society of Medical Oncology; CT, computed tomography; CCO, Cancer Care Ontario; NCCN, National Comprehensive Cancer Network; ASCRS, American Society of Colorectal Surgeons.

Fourth, the Panel did not rigidly define “higher risk.” While this usually refers to a patient with a node-positive, the risk-based plan developed by the doctor and patient at the beginning of the follow-up period cannot be underemphasized. Occasionally, stage II patients with several poor risk factors will want aggressive surveillance and even higher risk patients will not. Patients with lower risk cancers who want aggressive surveillance should receive physician counseling, not more tests.

Chest X-Ray

Current recommendation. No change From the last update of the guideline. Yearly chest x-rays are not recommended.

2005 literature update and discussion. In prior versions of this guideline, there was controversy among the Panel members about the value of chest x-rays since missing resectable metastases would be unfortunate. However, since the Panel has recommended annual CT scanning of the chest and abdomen for high-risk patients who are candidates for resection, routine chest x-rays are probably not relevant.

4. Endoscopic Surveillance Techniques

Colonoscopy. Current recommendation. All patients with colon and rectal cancer should have a colonoscopy for the pre- or perioperative documentation of a cancer- and polyp-free colon. Following the surgical treatment of colorectal cancer, the Panel recommends the surveillance guideline presented by the American Gastroenterology Association (AGA)²⁶—a colonoscopy at 3 years and then, if normal, once every 5 years thereafter. For colorectal cancer patients with high-risk genetic syndromes, the physician should consider the guideline published by the AGA (Table 5).

2005 literature update and discussion. The reference for colonoscopy surveillance has been updated. The AGA

guideline addresses screening of asymptomatic patients and those with inherited syndromes like HNPCC and FAP. The AGA guideline also addresses the colonoscopy follow-up of patients after colorectal cancer has been removed.

Flexible Proctosigmoidoscopy (Rectal Cancer)

Current recommendation. For patients who have not received pelvic radiation, flexible sigmoidoscopy of the rectum every six months for 5 years is recommended.

2005 literature update. Aside from minor changes in the wording, this recommendation has not changed Since 2000

5. Laboratory-Derived Prognostic and Predictive Factors (Note. This topic is new to the guideline.)

Current recommendation. Until prospective data are available, use of molecular or cellular markers should not influence the surveillance strategy.

2005 literature summary and discussion. The explosion of new prognostic and predictive markers since the last update was felt by the Panel to warrant comment on their potential influence on follow-up testing. Retrospective subset analyses have identified a number of markers for colorectal cancer patients.²³ Examples include selected categories of molecular markers including tumor suppressor genes (18q LOH), oncogenes (*c-myc*), apoptosis (*bcl-2*) and cell suicide-related genes, transforming growth factors, epidermal growth factor receptor genes, and angiogenesis-related genes (vascular endothelial growth factor).²⁷⁻²⁹ There are several cell proteins and carbohydrates that are potential markers for colorectal cancer, including EGF-R, L-catenin, MUC-1 mucin, and somatostatin receptors.³⁰ Investigators have also evaluated other factors such as microvessel density, DNA content, and proliferation

Table 5. Colon Cancer Screening Recommendations for People With Familial or Inherited Risk²⁶

Familial Risk Category	Screening Recommendations
First-degree relative affected with colorectal cancer or an adenomatous polyp at age > 60 years, or two second-degree relatives affected with colorectal cancer	Same as average risk but starting at age 40 years
Two or more first-degree relatives with colon cancer, or a single first-degree relative with colon cancer or adenomatous polyps diagnosed at an age < 60 years*	Colonoscopy every 5 years, beginning at age 40 years or 10 years younger than the earliest diagnosis in the family, whichever comes first
One second-degree or any third-degree relative with colorectal cancer†‡	Same as average risk
Gene carrier or at risk for familial adenomatous polyposis§	Sigmoidoscopy annually, beginning at age 10-12 years¶
Gene carrier or at risk for HNPCC	Colonoscopy, every 1-2 years, beginning at age 20-25 years or 10 years younger than the earliest diagnosis in the family, whichever comes first

NOTE. Reprinted from Colorectal cancer screening and surveillance: Clinical guidelines and rationale—Update based on new evidence. Gastroenterology 124:544-60, 2003; with permission from the American Gastroenterological Association.

Abbreviations: HNPCC, hereditary non-polyposis colorectal cancer; AAPC, attenuated adenomatous polyposis coli.

*First-degree relatives include patients, siblings, and children.

†Second-degree relatives include grandparents, aunts, and uncles.

‡Third-degree relatives include great-grandparents and cousins.

§Includes the subcategories of familial adenomatous polyposis, Gardner syndrome, some Turcot syndrome families, and AAPC.

¶In AAPC, colonoscopy should be used instead of sigmoidoscopy because of the preponderance of proximal colonic adenomas. Colonoscopy screening in AAPC should probably begin in the late teens or early 20s.

indices as other examples.³¹ There has been little multivariate analysis evidence generated and no large hypothesis-driven prospective randomized trials to confirm the utility of these markers for prognosis, predictive value, or as a tool for risk-associated surveillance strategies. Many of these markers have been integrated in current randomized clinical trial designs that will enhance the ability to generate consistent quality-controlled laboratory data linked to clinical outcome. The ASCO Gastrointestinal Cancer Tumor Markers Panel will publish guideline recommendations for selected tumor markers.

Research Issues

Recent colon and rectal cancer clinical trial data, including emerging potential prognostic factors and modifications of the TNM staging system, have provided evidence that risk-assessment models should become a new paradigm for future clinical trial design and for treatment and surveillance strategies. Rather than assume that all stage II and stage III colon or rectal cancer patients represent a uniform population, clinical trial design must include potential prognostic and predictive factors as variables linked to outcome. For example, staging subsets, number of lymph nodes sampled, and pathologic features (eg, grade, lymph/vascular invasion) should be components of the statistical analysis.²¹ Prospective clinical trials should evaluate the importance of post-treatment surveillance strategies linked to parameters of risk assessment to define the most optimal methods to detect cancer recurrence and the impact on survival. A future goal is to define molecular or other tumor or host characteristics that will allow individualized patient strategies for both treatment choice and post-treatment surveillance.

Note

ASCO guideline policy. It is important to emphasize that guidelines and technology assessments cannot always account for individual variation among patients. They are not intended to supplant physician judgment with respect to particular patients or special clinical situations, and cannot be considered inclusive of all proper methods of care or exclusive of other treatments reasonably directed at obtaining the same result. Accordingly, ASCO considers adherence to this guideline assessment to be voluntary, with the ultimate determination regarding its application to be made by the physician in light of each patient's individual circumstances. In addition, this guideline describes the use of procedures and therapies in clinical practice; it cannot be assumed to apply to the use of these interventions performed in the context of clinical trials, given that clinical studies are designed to evaluate or validate innovative approaches in a disease for which improved staging and treatment is needed. In that guideline development involves a review and synthesis of the latest literature, a practice guideline also serves to identify important questions and settings for further research.

Acknowledgment

The Panel wishes to express its gratitude to Dr S. Gail Eckhardt of the ASCO Board of Directors and to Dr Craig Earle and the Health Services Committee for thoughtful comments on an earlier draft of the Update. The Panel is also grateful to Dr Bernard Levin for his guidance on the colonoscopy recommendation, and to Dr Jerome Seidenfeld for his statistical advice.

Appendix 1.

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Authors' Disclosures of Potential Conflicts of Interest

Although all authors completed the disclosure declaration, the following author or immediate family members indicated a financial interest. No conflict exists for drugs or devices used in a study if they are not being evaluated as part of the investigation. For a detailed description of the disclosure categories, or for more information about ASCO's conflict of interest policy, please refer to the Author Disclosure Declaration and the Disclosures of Potential Conflicts of Interest section in Information for Contributors.

Authors	Employment	Leadership	Consultant	Stock	Honoraria	Research Funds	Testimony	Other
Patrick J. Flynn			Genentech (A); Sanofi (A)					
Dollar Amount Codes (A) < \$10,000 (B) \$10,000-99,999 (C) ≥ \$100,000 (N/R) Not Required								

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In the Recommendations section of the Abstract, the term protosigmoidoscopy should have been proctosigmoidoscopy.

In the section "4. Endoscopic Surveillance Techniques," subsection "Colonoscopy. Current Recommendation," the phrase "preor perioperative documentation" should have been "pre- or perioperative documentation," and the phrase "a colonoscopy at 3 years and then, if normal, then every five years thereafter" should have been "a colonoscopy at 3 years and then, if normal, once every 5 years thereafter."

The online version has been corrected in departure from the print.

DOI: 10.1200/JCO.2006.01.904



The December 1, 2005, article by Crawford et al titled, "Does Aggressive Surgery Only Benefit Patients With Less Advanced Ovarian Cancer? Results From an International Comparison Within the SCOTROC-1 Trial" (J Clin Oncol 23:8802-8811, 2005) contained an error. In the Results section of the Abstract, the second sentence repeats the term "non-UK patients" twice, whereas it should have read "UK patients" in the second instance, as follows:

First, more extensive surgery was performed in non-UK patients, who were more likely to be optimally debulked (≤ 2 cm residual disease) than UK patients (71.3% v 58.4%, respectively; $P < .001$).

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DOI: 10.1200/JCO.2006.01.905



The December 20, 2005, article by Reardon et al titled, "Phase II Study of Imatinib Mesylate Plus Hydroxyurea in Adults With Recurrent Glioblastoma Multiforme" (J Clin Oncol 23:9359-9368, 2005) contained errors.

The fourth co-author's name was given as Jeremy N. Rich Sr, whereas it should have been Jeremy N. Rich. The fifth co-author's name was given as Idharan Gururangan, whereas it should have been Sridharan Gururangan.

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