Guidelines for Colonoscopy Surveillance After Screening and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer

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Abstract

Screening for colorectal cancer (CRC) in asymptomatic patients can reduce the incidence and mortality of CRC. In the United States, colonoscopy has become the most commonly used screening test. Adenomatous polyps are the most common neoplasm found during CRC screening. There is evidence that detection and removal of these cancer precursor lesions may prevent many cancers and reduce mortality. (1) However, patients who have adenomas are at increased risk for developing metachronous adenomas or cancer compared with patients without adenomas. There is new evidence that some patients may develop cancer within 3–5 years of colonoscopy and polypectomy—so-called interval cancers.

Ideally, screening and surveillance intervals should be based on evidence showing that interval examinations prevent interval cancers and cancer-related mortality. We have focused on the interval diagnosis of advanced adenomas as a surrogate marker for the more serious end point of cancer incidence or mortality. In 2006, the United States Multi-Society Task Force (MSTF) on CRC issued a guideline on postpolypectomy surveillance, (2) which updated a prior 1997 guideline. A key principle of the 2006 guideline was risk stratification of patients based on the findings at the baseline colonoscopy. The surveillance schema identified 2 major risk groups based on the likelihood of developing advanced neoplasia during surveillance: (1) low-risk adenomas (LRAs), defined as 1–2 tubular adenomas <10 mm, and (2) high-risk adenomas (HRAs), defined as adenoma with villous histology, high-grade dysplasia (HGD), ≥10 mm, or 3 or more adenomas. The task force also published recommendations for follow-up after resection of CRC. (3)

More recently, the British Society of Gastroenterology updated their 2002 surveillance guideline in 2010.(4) Their risk stratification differs from the US guideline, dividing patients into 3 groups: low risk (1–2 adenomas <10 mm), intermediate risk (3–4 small adenomas or one ≥10 mm), and high risk (>5 small adenomas or ≥3 with at least one ≥10 mm). They recommend that the high-risk group undergo surveillance at 1 year because of concerns about missed lesions at baseline. US guidelines place emphasis on performing a high-quality baseline examination. In 2008, the MSTF published screening guidelines for CRC, which included recommendations for the interval for repeat colonoscopy after negative findings on baseline examination. (5)

New issues have emerged since the 2006 guideline, including risk of interval CRC, proximal CRC, and the role of serrated polyps in colon carcinogenesis. New evidence suggests that adherence to prior guidelines is poor. The task force now issues an updated set of surveillance recommendations. During the past 6 years, new evidence has emerged that endorses and strengthens the 2006

recommendations. We believe that a stronger evidence base will improve adherence to the guidelines. The 2012 guidelines are summarized in Table 1 and are based on risk stratification principles used in the 2006 guideline. The ensuing discussion reviews the new evidence that supports these guidelines. This guideline does not address surveillance after colonoscopic or surgical resection of a malignant polyp.

Table 1. 2012 Recommendations for Surveillance and Screening Intervals in Individuals With Baseline Average Risk

Baseline colonoscopy: most advanced finding(s)	**Recommended surveillance interval (*y*)**	**Quality of evidence supporting the recommendation**	**New evidence stronger than 2006**
No polyps	10	Moderate	Yes
Small (<10 mm) hyperplastic polyps in rectum or sigmoid	10	Moderate	No
1–2 small (<10 mm) tubular adenomas	5–10	Moderate	Yes
3–10 tubular adenomas	3	Moderate	Yes
>10 adenomas	<3	Moderate	No
One or more tubular adenomas ≥10 mm	3	High	Yes
One or more villous adenomas	3	Moderate	Yes
Adenoma with HGD	3	Moderate	No
Serrated lesions			
Sessile serrated polyp(s) <10 mm with no dysplasia	5	Low	NA
Sessile serrated polyp(s) ≥10 mm OR Sessile serrated polyp with dysplasia OR Traditional serrated adenoma	3	Low	NA
Serrated polyposis syndrome[a]	1	Moderate	NA

NOTE. The recommendations assume that the baseline colonoscopy was complete and adequate and that all visible polyps were completely removed. NA, not applicable.

[a]Based on the World Health Organization definition of serrated polyposis syndrome, with one of the following criteria: (1) at least 5 serrated polyps proximal to sigmoid, with 2 or more ≥10 mm; (2) any serrated polyps proximal to sigmoid with family history of serrated polyposis syndrome; and (3) >20 serrated polyps of any size throughout the colon.

Levels of Evidence

There are no high-quality randomized controlled trials of polyp surveillance performed in the past 6 years. All studies are either retrospective or prospective observational, cohort, population-based, or case-control studies. We have adopted a well-accepted rating of evidence (6) that relies on expert consensus about whether new research is likely to change the confidence level of the recommendation (Table 3).

Table 3. Rating Evidence

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

NEW EVIDENCE ON LIMITATIONS OF COLONOSCOPIC SURVEILLANCE

1. New evidence documents the risk of developing interval CRC after polypectomy or negative findings on baseline colonoscopy.
2. Important lesions are missed at baseline colonoscopy.
3. Adenomas may be incompletely removed at the time of baseline colonoscopy.
4. Interval CRC may biologically differ from prevalent CRC.
5. Quality of baseline colonoscopy is associated with risk of interval cancer.

RECOMMENDATIONS FOR SURVEILLANCE

1. **Baseline examination: no adenomas or polyps**
   - 2008 recommendation for next examination — 10 years
   - 2012 recommendation for next examination — No change
   - Quality of evidence — Moderate – stronger than 2008

2. **Baseline examination: no adenomas; distal small (<10 mm) hyperplastic polyps**
   - 2006 recommendation for next examination — 10 years
   - 2012 recommendation for next examination — No change
   - Quality of evidence — Moderate

3. **Baseline examination: 1–2 tubular adenomas <10 mm**
   - 2006 recommendation for next examination — 5- to 10-year interval
   - 2012 recommendation for next examination — No change
   - Quality of evidence — Moderate – evidence stronger than 2006

4. **Baseline examination: 3–10 adenomas**

2006 recommendation for next examination	3-year interval
2012 recommendation for next examination	No change
Quality of evidence	Moderate: if any polyp ≥6 mm Low: if all polyps <6 mm Evidence stronger than 2006

5. **Baseline examination: >10 adenomas**

2006 recommendation for next examination	<3-year interval
2012 recommendation for next examination	No change
Quality of evidence	Moderate – high

6. **Baseline examination: one or more tubular adenomas ≥10 mm**

2006 recommendation for next examination	3-year interval
2012 recommendation for next examination	No change
Quality of evidence	High – evidence stronger than 2006

7. **Baseline examination: one or more adenomas with villous features of any size**

2006 recommendation for next examination	3-year interval
2012 recommendation for next examination	No change
Quality of evidence	Moderate

8. **Baseline examination: one or more adenomas with HGD**

2006 recommendation for next examination	3-year interval
2012 recommendation for next examination	No change
Quality of evidence	Moderate

9. **Baseline examination: serrated polyps**

2006 recommendation for next examination	None
2012 recommendation for next examination	See Table 1
Quality of evidence	None

OTHER ISSUES RELATED TO COLON SURVEILLANCE

Surveillance after the first follow-up colonoscopy. The follow-up of patients after they undergo surveillance has been uncertain. It is not clear if risk continues to be increased if surveillance colonoscopy reveals an LRA or no neoplasia. There are 3 new cohort studies that have followed up patients over several surveillance cycles to determine the risk of advanced neoplasia over time. (67, 77, 78) These studies all have important limitations, because many patients did not receive a second surveillance, which could lead to selection bias, and intervals were irregular. Data from these studies are summarized in Table 9. These data suggest that the detection of an advanced adenoma is an important risk factor for finding advanced adenoma at the next examination. Once patients have a low-risk lesion or no adenoma, the risk of advanced neoplasia at the next examination is lower. Patients with LRA at baseline and no adenomas at first surveillance have a very low risk (2.8%–4.9%) of having advanced adenomas at the second surveillance examination 3–5 years later. Although the evidence is weak due to incomplete follow-up of the cohorts, it is consistent across 3 longitudinal studies.

Table 9. Multiple Rounds of Colonoscopy Surveillance

Baseline colonoscopy	First surveillance	Advanced neoplasia at second surveillance (%)		
		Pinsky et al, 2009, Prostate Lung Colorectal Ovarian Cancer study (67)	Laiyemo et al, 2009, PPT (77)	Robertson et al, 2009 (78)
HRA	HRA	19.3	30.6	18.2
	LRA	6.7	8.9	13.6
	No adenoma	5.9	4.8	12.3
LRA	HRA	15.6	6.9	20.0
	LRA	5.7	4.7	9.5
	No adenoma	3.9	2.8	4.9
No adenoma	HRA	11.5		
	LRA	4.7		
	No adenoma	3.1		

NOTE. HRA is defined as 3 or more adenomas, tubular adenoma ≥10 mm, adenoma with villous histology, or HGD. LRA is defined as 1–2 tubular adenomas <10 mm.

Recommendation. We believe that patients with LRA at baseline and negative findings at first surveillance can have their next surveillance examination at 10 years. Patients who have HRA at any examination appear to remain at high risk and should have shorter follow-up intervals for surveillance. A summary of these recommendations is outlined in Table 10.

Table 10. Recommendations for Polyp Surveillance After First Surveillance Colonoscopy

Baseline colonoscopy	First surveillance	Interval for second surveillance (*y*)
LRA	HRA	3
	LRA	5
	No adenoma	10
HRA	HRA	3
	LRA	5
	No adenoma	5[a]

[a]If the findings on the second surveillance are negative, there is insufficient evidence to make a recommendation.

When should surveillance stop?

There is considerable new evidence that the risk of colonoscopy increases with advancing age. (79, 80) Both surveillance and screening should not be continued when risk may outweigh benefit. The United States Preventive Services Task Force (USPSTF) determined that screening should not be continued after age 85 years (81) because risk could exceed potential benefit. Patients with HRA are at higher risk for developing advanced neoplasia compared with average-risk screenees. Therefore, the potential benefit of surveillance could be higher than for screening in these individuals. For patients aged 75–85 years, the USPSTF recommends against continued routine screening but argues for individualization based on comorbidities and findings of any prior colonoscopy. This age group may be more likely to benefit from surveillance, depending on life expectancy.

It is the opinion of the MSTF that the decision to continue surveillance should be individualized, based on an assessment of benefit, risk, and comorbidities.

When should colonoscopy be repeated if there is a poor bowel preparation at baseline colonoscopy?

Poor-quality bowel preparations that obscure visualization of the colon may be associated with missed lesions at the baseline colonoscopy. (68, 82) Current quality indicators for colonoscopy call for monitoring the quality of bowel preparation, (39) with the goal of achieving preparations adequate for detection of lesions >5 mm. There is now substantial evidence (83) that splitting the dose of bowel preparation results in better quality, and this practice is strongly encouraged by the MSTF.

If the bowel preparation is poor, the MSTF recommends that in most cases the examination should be repeated within 1 year. Alternative methods of imaging, such as CT colonography, also require excellent bowel preparation for an adequate examination. If the bowel preparation is fair but adequate (to detect lesions >5 mm) and if small (<10 mm) tubular adenomas are detected, follow-up at 5 years should be considered.

Positive FOBT (guaiac FOBT or fecal immunochemical test) result before scheduled surveillance

If patients have an adequate baseline colonoscopy, surveillance colonoscopy should be based on the current guidelines. Patients should not have interval fecal blood testing if colonoscopy is planned. The role of interval fecal testing is uncertain. (84) A recent study from Australia found that interval fecal immunochemical test led to diagnosis of cancers before the scheduled surveillance. (85) However, this study included patients with baseline cancer and did not provide information about the findings or quality of the baseline examination, which may have been important risk factors for interval pathology. In clinical practice, patients may have had an interval FOBT performed. A decision to perform an early colonoscopy due to positive fecal test result could be based on careful review of the baseline examination. If this examination was not complete or somewhat compromised by fair bowel preparation, it may be quite reasonable to perform an early examination. There are no data to support the practice of a routine early examination and no evidence that these patients have a higher than expected risk of cancer or advanced adenoma.

Interval fecal testing should not be a substitute for high-quality performance of colonoscopy. The task force recommends that interval fecal testing not be performed within the first 5 years after colonoscopy. There is currently insufficient evidence to support this practice. The likelihood of false-positive test results is high, which would result in unnecessary early colonoscopies.

If fecal blood test is performed in the first 5 years after colonoscopy, there is insufficient evidence to make a recommendation. If the patient does have an interval-positive FOBT result, the clinician's judgment to repeat colonoscopy could consider the prior colonoscopy findings, completeness of examination and bowel preparation, and family history. Despite the low likelihood of significant pathology if the baseline examination was high quality, we recognize that there may be concerns about missed lesions at the baseline examination. Potential medical-legal issues often lead to repeat examination. Future studies of this subject should carefully document the quality of the baseline examination and determine rates of significant pathology.

Development of new symptoms during the surveillance interval (minor rectal bleeding, diarrhea, constipation)

Patients may develop new problems within 3–5 years after colonoscopy that might otherwise be indications for colonoscopy. If patients develop significant lower gastrointestinal bleeding as defined by clinical judgment, they may need further evaluation.

Change in bowel habits, abdominal pain, or minor rectal bleeding are common symptoms that may occur after completion of a colonoscopy. This creates a clinical dilemma: should colonoscopy be repeated before the scheduled surveillance examination? The likelihood of finding significant pathology after a prior complete and adequate colonoscopy is uncertain but likely to be low. However, if the colonoscopy will answer an important clinical question, it may be valuable to repeat.

The consensus of the task force is that there is insufficient evidence to make a recommendation.

Should surveillance be modified based on lifestyle risk factors for CRC?

There is considerable new evidence that risk of recurrent adenomas may be reduced by taking aspirin or nonsteroidal anti-inflammatory drugs. (11, 54, 55, 56, 57) We believe there is insufficient evidence to recommend any change in surveillance intervals in patients who are taking these medications.

Should surveillance be modified based on patient race, ethnicity, or sex?

CRC age-adjusted risk varies based on patient demographic characteristics. However, there is no new evidence that that the surveillance interval should be altered once patients have had colonoscopy and polypectomy based on these factors.