Colonoscopy Polyp Assessment Removal and Surveillance After Polypectomy, and After Cancer Resection

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Recommendations for Follow-Up After Colonoscopy and Polypectomy: A Consensus Update by the US Multi-Society Task Force on Colorectal Cancer

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Surveillance

Surveillance is the examinations that are performed in a patient with known previous disease in an attempt to modify and address future risk

Why new guidelines?

- Large number of patients with adenomas identified
- Surveillance is a huge burden on medical resources
- Need for increased efficiency of surveillance colonoscopy
- Decrease cost, risk and overuse of resources
- **The first screening colonoscopy at age 50 is the one with the most-impact in CRC mortality; excessive "surveillance" affects our ability to offer 1st screening colonoscopy to others.**

Guideline endorsed by:

- Colorectal Cancer Advisory Committee of the American Cancer Society
- American College of Gastroenterology
- American Gastroenterological Association
- American Society for Gastrointestinal Endoscopy

Literature reviewed

- Colonoscopy studies addressing relationship between baseline findings and detection of advanced adenoma during follow up
- Sigmoidoscopy studies with large cohorts and follow-up periods longer than 10 yrs addressing the relationship between baseline findings and detection of advanced adenomas at follow up
- 15 studies were identified

Advanced Adenoma (AA)

- Sized 1.0 cm or larger OR
- Any villous component (nontubular) OR
- High grade dysplasia OR
- Invasive cancer
- Advanced Adenoma is a surrogate biological-indicator of cancer risk

Predictors of Subsequent Advanced Adenomas (AA)

- Multiplicity
- Size
- Histology
- Location
- Other risk factors – age, sex, history of polyps, family history of CRC

Multiplicity

- Increased number of adenomas at baseline has been shown to predict subsequent detection of advanced adenoma (AA)
  - National Polyp Study (RCT)
  - European fiber and calcium study (RCT)
  - Wheat bran study (Martinez et al) (RCT)
  - Atkin et al (observational cohort)
  - Noshirwani et al (observational cohort)

Gastroenterology- 2006 (Vol. 130, Issue 6: 1872-1885)

Size

- Larger adenoma size was related to increased risk for subsequent AA or CRC
  - Wheat bran study (RCT): size larger than 1 cm predicted metachronous advanced adenomas
  - 4 other RCT did not find size to an independent predictor
  - 7 out of 8 observational cohort studies showed size predicted future AA or CRC

Gastroenterology- 2006 (Vol. 130, Issue 6: 1872-1885)

Histology

- Overall, presence of villous component and/or high grade dysplasia correlated with increased risk of AA or CRC
  - None of the RCT showed histologic type of adenoma at baseline to be a significant predictor of advanced neoplasia, but
  - Several of the observational cohort studies showed that advanced histology conferred increased risk of AA in follow-up.

IMPORTANT HISTOLOGY CONCEPT

Serrated Adenoma

- Hyperplastic polyp with mixed features of Hyperplastic and Adenomatous polyp.
  - Sessile Serrated Adenoma (SSA) (usually without dysplasia; if dysplastic will be called “Mixed Serrated Polyp”)
  - Traditional Serrated Adenoma (TSA) (villiform projections with dysplastic cells)
  - Proximal Serrated polyps are higher risk than those in sigmoid or rectum.
- 20-30% of “Sporadic CRC” comes from Serrated Adenomas.
- Polyps usually proximal, large, pale color, sessile, often covered with mucus.

IMPORTANT HISTOLOGY CONCEPT

Serrated Adenoma

- Linked to ‘sporadic microsatellite instability adenocarcinoma’ – due to acquired mismatch repair deficiency (BRAF or CpG Island Methylator Phenotype (CIMP))
- The risk of malignant transformation is higher with SSA than with the others, but all have increased risk.
- **For Surveillance Programs, “Serrated Adenomas” should be treated as regular adenomas.**

Location

- Proximal adenoma found at baseline was associated with an increased risk for subsequent Advanced Adenoma
  - Seen in 2 RCT and 1 observational cohort studies

Other risk factors

- Age
  - 2 RCT showed increased risk for subsequent neoplasia with increased age
- Sex
  - 2 RCT reported an increased risk for men for advanced neoplasia
- History of polyps
  - polyps present before “baseline adenoma” was found are associated with increased risk of more AA (2RCT)
- Family history of CRC
  - in relative >/= 60, increases 4.8 fold the risk of AA in subsequent colonoscopy.
  - increased risk for CRC (2.4 fold with 1 relative; 4.2 fold if > 1) & AA.

FOBT Testing in Post-Polypectomy Patients

- National Polyp Study: 77% of colonoscopies performed to evaluate (+)FOBT detected no AA nor CRC (PPV = 23%)
- Bampton et al: in a high risk cohort, PPV of immunochemical FOBT was only 27%.
- Follow-up colonoscopy intervals based in “risk stratification” are conservative and shortening the interval due to a (+) FOBT is unlikely to improve over the current 76-90% CRC incidence reduction.
- **In patients in a “surveillance colonoscopy program”, the use of FOBT is currently discouraged.**

High-quality Baseline Colonoscopy

- **Should be satisfied before starting Screening or Surveillance Program.**
- **Critical for effectively reducing colon cancer risk.**
  - **Reaches cecum (photodocumentation)**
  - **Little fecal residue (good prep)**
  - **Minimum time of withdrawal from the cecum of 6-10 minutes**
  - **Meticulous removal of large sessile polyps – particularly if piecemeal polypectomy used (repeat exam if needed)**

Lesion Assessment and Description

Kaltenbach T et al. GASTROINTESTINAL ENDOSCOPY Volume 91, No. 3 : 2020; 486-519

- We recommend the documentation of endoscopic descriptors of the lesion, including location, size in millimeters, and morphology in the colonoscopy procedure report. (Strong recommendation, low-quality evidence)
- We suggest the use of the Paris classification to describe the surface morphology in order to provide a common nomenclature (Conditional recommendation, low-quality evidence)
- We suggest that for non-pedunculated adenomatous (Paris 0-II and 0-Is) lesions 10 mm, surface morphology should be also described as granular or non-granular lateral spreading lesions. (Conditional recommendation, low-quality evidence)

Lesion Assessment and Description

- We recommend photo documentation of all lesions 10 mm in size before removal, and suggest photo documentation of the post resection defect (Strong recommendation, low-quality evidence).
- We suggest proficiency in the use of electronic- (eg, NBI, i-scan, Fuji Intelligent Chromoendoscopy, or blue light imaging) or dye (chromoendoscopy)-based image-enhanced endoscopy techniques to apply optical diagnosis classifications for colorectal lesion histology. (Conditional recommendation, moderate-quality evidence)
- We recommend proficiency in the endoscopic recognition of deep submucosal invasion. (Strong recommendation, moderate-quality evidence)

Paris Classification of Superficial (Type 0) Colon and Rectum Neoplasia

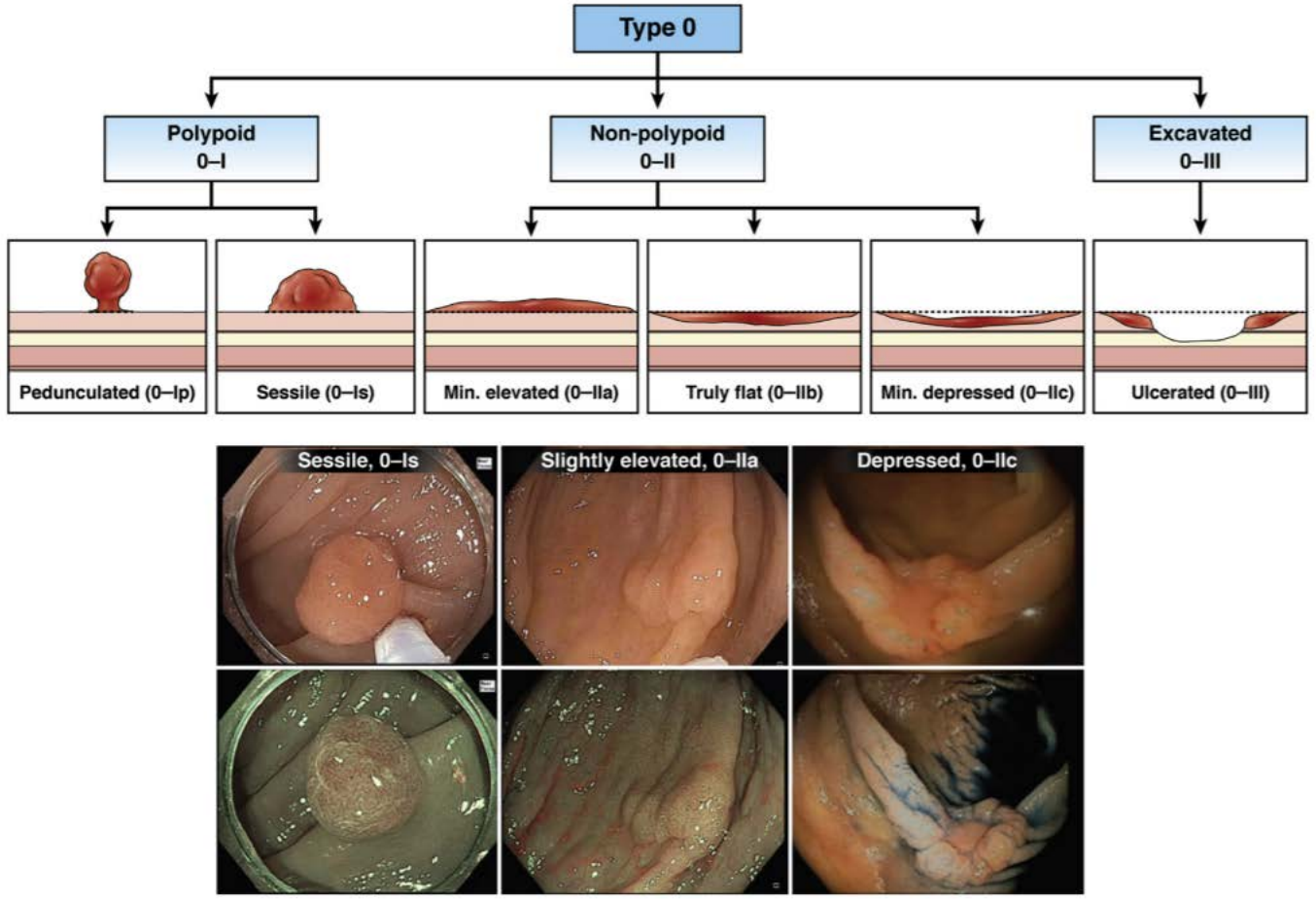


Figure 1. Paris Endoscopic Classification of superficial neoplastic lesions in the colon and rectum.

Paris types 1 to 5 are Advanced Cancers

Optical Diagnosis of Colorectal Lesions Using NBI (NICE Classification)

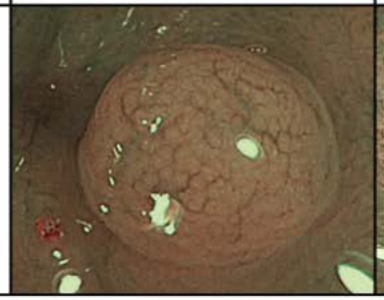
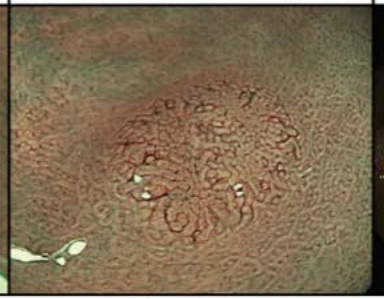
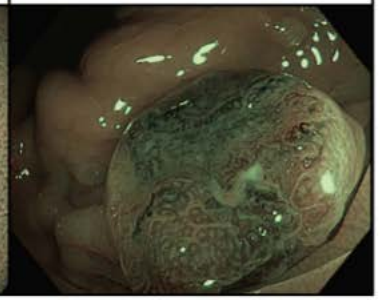
	Type 1	Type 2	Type 3
Color	Same or lighter than background	Browner relative to background (verify color arises from vessels)	Brown to dark brown relative to background; sometimes patchy whiter areas
Vessels	None, or isolated lacy vessels may be present coursing across the lesion	Brown vessels surrounding white structures**	Has area(s) of disrupted or missing vessels
Surface pattern	Dark or white spots of uniform size, or homogeneous absence of pattern	Oval, tubular, or branched white structures** surrounded by brown vessels	Amorphous or absent surface pattern
Most likely pathology	Hyperplastic and sessile serrated lesions***	Adenoma****	Deep submucosal invasive cancer
			

Figure 3. Optical diagnosis of colorectal lesions, NICE classification. The diagnostic criteria for colorectal lesions using NBI as recommended in the NICE classification. The use of confidence levels (high or low) in making an optical diagnosis is important in its implementation in clinical practice. *Can be applied using colonoscopes with or without optical (zoom) magnification. **These structures (regular or irregular) may represent the pits and the epithelium of the crypt opening. ***In the World Health Organization classification, sessile serrated polyp and sessile serrated adenoma are synonymous. Sessile serrated polyps often demonstrate some dark, dilated crypt orifices. ****Type 2 consists of Vienna classification types 3, 4, and superficial 5 (all adenomas with either low- or high-grade dysplasia, or with superficial submucosal carcinoma). The presence of high-grade dysplasia or superficial submucosal carcinoma may be suggested by an irregular vessel or surface pattern, and is often associated with atypical morphology (eg, depressed area).

Sessile Serrated Lesions

Clouded Surface

Irregular Shape

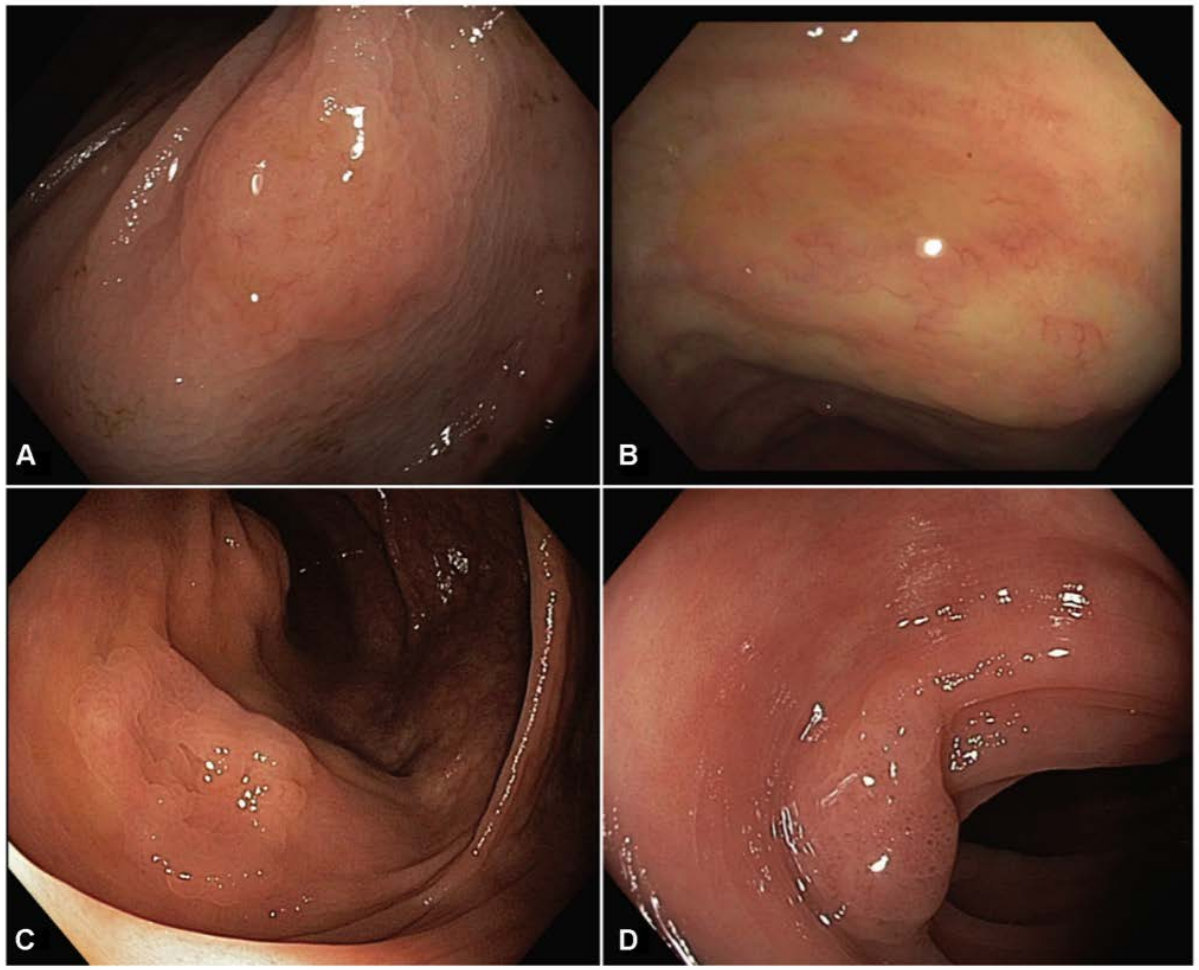


Figure 4. Morphologic features of sessile serrated lesions. Sessile serrated lesion–like features are defined as (**A**) a clouded surface, (**B**) indistinctive borders, (**C**) irregular shape, or (**D**) dark spots inside the crypts. These morphologic features are used to differentiate between sessile serrated lesions and hyperplastic lesions in the type 1 NICE polyps. The presence of at least 2 sessile serrated lesion–like features is hereby considered sufficient to diagnose a sessile serrated lesion.

Indistinctive Borders

Dark Spots in Crypts

Lesion Removal
Non-pedunculated (10–19 mm) lesions

- We suggest cold or hot snare polypectomy (with or without submucosal injection) to remove 10- to 19-mm non-pedunculated lesions. (Conditional recommendation, low-quality evidence)

Lesion Removal
Non-pedunculated (20 mm) lesions

- We recommend EMR as the preferred treatment method of large (20 mm) non-pedunculated colorectal lesions. Endoscopic resection can provide complete resection and obviate the higher morbidity, mortality, and cost associated with alternative surgical treatment. (Strong recommendation, moderate-quality evidence)
- We recommend an endoscopist experienced in advanced polypectomy to manage large (20 mm) non-pedunculated colorectal lesions. (Strong recommendation, low-quality evidence)
- We recommend snare resection of all grossly visible tissue of a lesion in a single colonoscopy session and in the safest minimum number of pieces, as prior failed attempts at resection are associated with higher risk for incomplete resection or recurrence. (Strong recommendation, low-quality evidence)

Lateral Spreading Lesions (>/= 10 mm): Granular type (A & B) and Non-Granular Type (C & D)

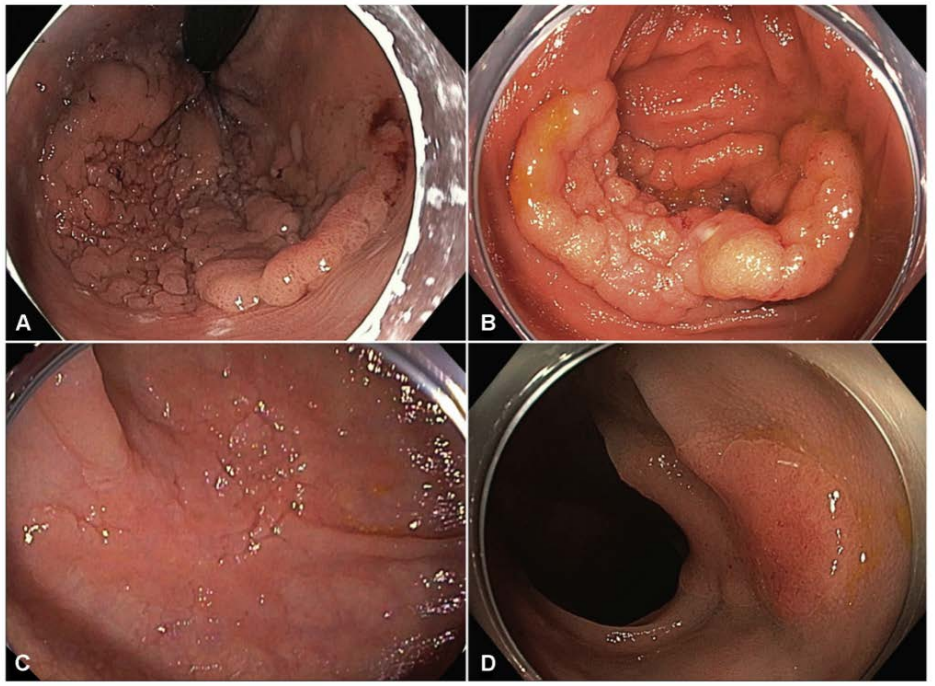


Figure 2. Lateral spreading lesions. Non-polypoid lesions ≥10 mm in diameter are referred to as laterally spreading tumors (LSTs). They have a low vertical axis and extend laterally along the luminal wall. LSTs are morphologically subclassified into granular type (LST-G) (**A, B**), which have a nodular surface, and non-granular type (LST-NG), which have a smooth surface (**C, D**). This macroscopic distinction is important to facilitate the endoscopic removal plan as it provides information about the risk of cancer or submucosal fibrosis in order to anticipate the technical ease or difficulty of the removal. Overall, LSTs were found to contain submucosal invasion (SMI) in 8.5% of the cases (95% CI, 6.5%–10.5%; I^2 86.8%; 26 studies) and high-grade dysplasia in 36.7% of the cases (95% CI 30.3%–43.2%; I^2 91.9%; 23 studies). Non-granular LSTs more often contained SMI than granular LSTs: 11.7% vs 5.9% (OR, 1.89; 95% CI, 1.48–2.42).

Non-Granular are more likely to have Submucosal invasion (11.7%) vs Granular (5.9%)

Lesion Removal
Non-pedunculated (20 mm) lesions

- We suggest the use of a contrast agent, such as indigo carmine or methylene blue, in the submucosal injection solution to facilitate recognition of the submucosa from the mucosa and muscularis propria layers. (Conditional recommendation, moderate-quality evidence)
- We recommend against the use of tattoo, using sterile carbon particle suspension, as the submucosal injection solution. The carbon particle suspension may result in submucosal fibrosis, and can thus reduce the technical success of future endoscopic resection of residual or recurrent lesion. (Strong recommendation, low-quality evidence)
- We suggest the use of a viscous injection solution (eg, hydroxyethyl starch, Eleview, ORISE Gel) for lesions 20 mm to remove the lesion in fewer pieces and less procedure time compared to normal saline. (Conditional recommendation, moderate-quality evidence)

Suggested Electrocautery Settings

Method	Mode	Effect	Cut duration	Cut interval	Maximum watts
Inject-and-cut EMR	Endocut Q	2/3	1	4	-
Snare tip soft coagulation	Soft Coag	5	-	-	80
Hot forceps avulsion	Endocut I	1	4	1	-
Underwater EMR	Autocut, Drycut	5	-	-	80

Lesion Removal
Non-pedunculated (20 mm) lesions

- We recommend against the use of ablative techniques (eg, APC, snare tip soft coagulation) on endoscopically visible residual tissue of a lesion as they have been associated with an increased risk of recurrence. (Strong recommendation, moderate-quality evidence)
- We suggest the use of adjuvant thermal ablation of the post-EMR margin, where no endoscopically visible adenoma remains despite meticulous inspection. There is insufficient evidence to recommend a specific modality (ie, APC, snare tip soft coagulation) at this time. (Conditional recommendation, moderate-quality evidence)
- We recommend detailed inspection of the post-resection mucosal defect to identify features for immediate or delayed perforation risk, and perform endoscopic clip closure, accordingly. (Strong recommendation, moderate-quality evidence)

Lesion Removal
Non-pedunculated (20 mm) lesions

- We suggest prophylactic closure of resection defects 20 mm in size in the right colon, when closure is feasible. (Conditional recommendation; moderate-quality evidence)
- We suggest treatment of intraprocedure bleeding using endoscopic coagulation (eg, coagulation forceps or snare-tip soft coagulation) or mechanical therapy (eg, clip), with or without the combined use of dilute epinephrine injection. (Conditional recommendation, low-quality evidence)
- We suggest that patients on anti-thrombotics who are candidates for endoscopic removal of a colorectal lesion 20 mm receive individualized assessment, balancing the risks of interrupting anticoagulation for colonoscopic polypectomy or mucosal resection against the risks of significant bleeding during and after the procedure. (Conditional recommendation, low-quality evidence)

Lesion Removal
Pedunculated Lesions

- We recommend hot snare polypectomy to remove pedunculated lesions 10 mm (Strong recommendation, moderate-quality evidence)
- We recommend prophylactic mechanical ligation of the stalk with a detachable loop or clips on pedunculated lesions with head 20 mm or with stalk thickness 5 mm to reduce immediate and delayed post-polypectomy bleeding. (Strong recommendation, moderate-quality evidence)
- We suggest retrieval of large pedunculated polyp specimens en bloc to ensure ability to assess resection margins, rather than dividing polyp heads to facilitate through-the-scope specimen retrieval. (Conditional recommendation, low-quality evidence)

Proper Removal of Colon Polyps

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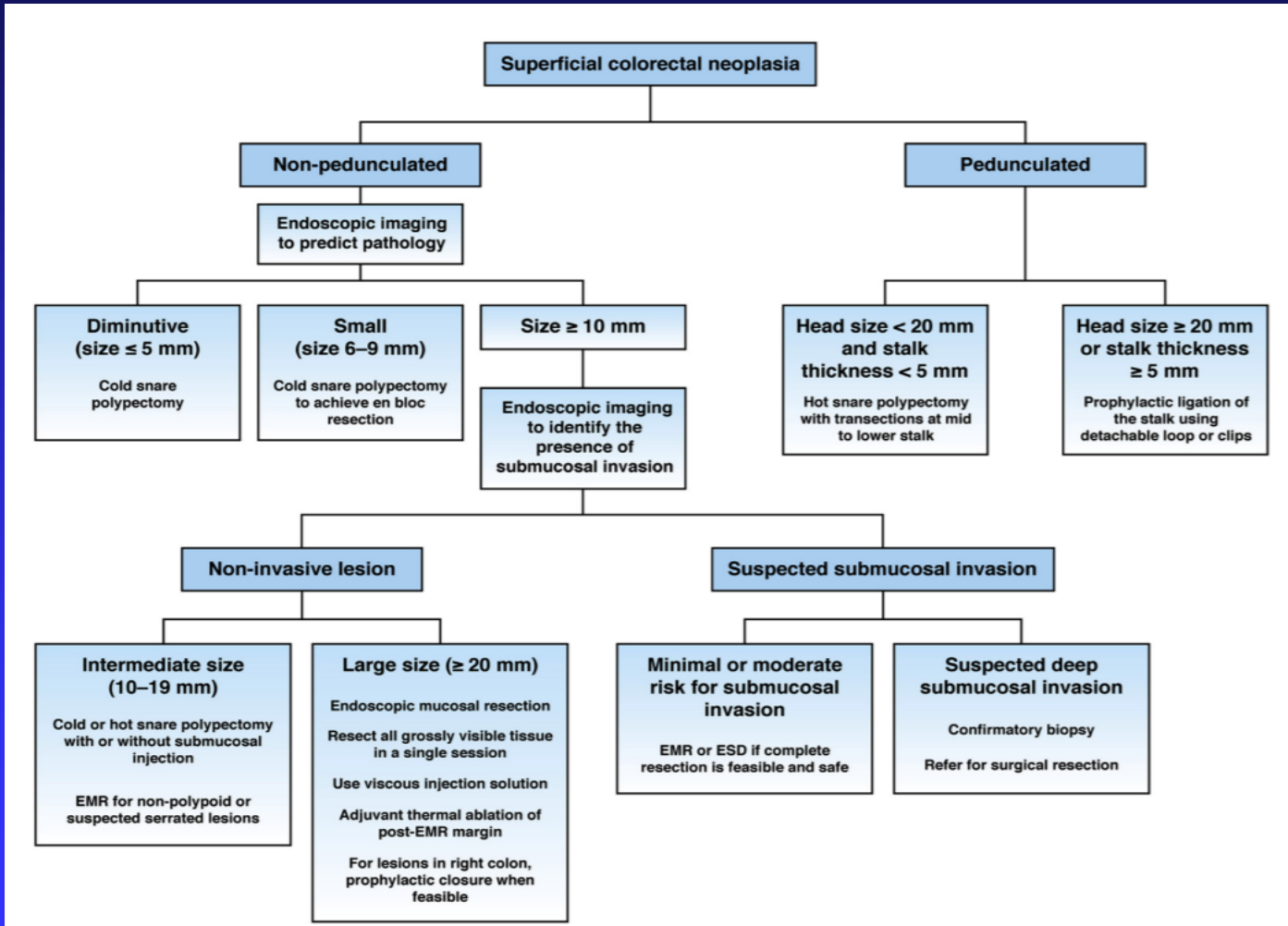


Figure 5. Algorithm for the management of colorectal lesions.

Lesion Marking

- We recommend the use of tattoo, using sterile carbon particle suspension, to demarcate any lesion that may require localization at future endoscopic or surgical procedures. (Strong recommendation, low-quality evidence)
- We suggest placing the tattoo at 2–3 separate sites located 3–5 cm anatomically distal to the lesion (anal side), particularly when the purpose is to mark the lesion for later endoscopic resection. The carbon particle suspension, if injected at or in close approximation to the lesion, may result in submucosal fibrosis, and can thus reduce the technical success and increase the risk of future endoscopic resection. (Conditional recommendation, low-quality evidence)
- We suggest endoscopists and surgeons establish a standard location of tattoo injection relative to the colorectal lesion of interest at their institution. (Conditional recommendation, very low-quality evidence)
- We recommend documentation of the details of the tattoo injection (material, volume, position relative to the lesions) in the colonoscopy report, as well as photo documentation of the tattoo in relation to the colorectal lesion. (Strong recommendation, low-quality evidence)

Tattooing: Bleb Technique

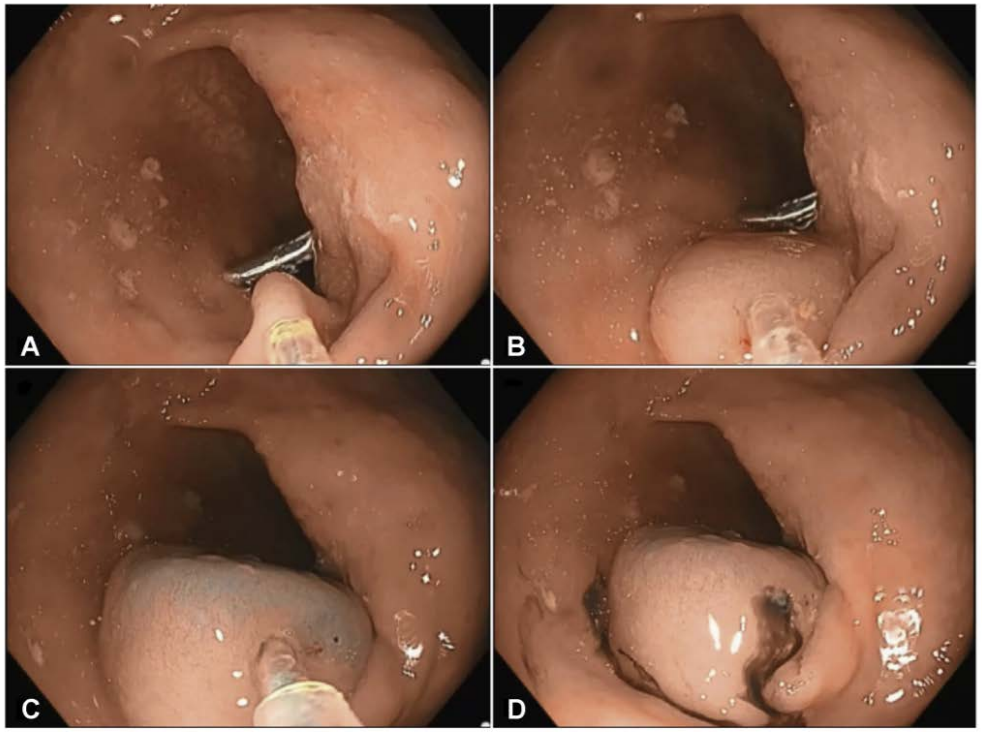


Figure 14. The bleb technique for tattooing. (**A**) A clip is visible protruding from an EMR site proximal to the visible fold. A needle is in the submucosa and tented toward the lumen so that the shape of the needle is visible. Visualization of the needle shape ensures submucosal location of the needle tip. (**B**) A small saline bleb is made and the saline bleb is seen immediately after needle withdrawal. (**C**) The tattoo-loaded needle is inserted into the saline bleb and 1-mL tattoo is injected. (**D**) The finished tattoo.

Surveillance after Piecemeal Resection

- We recommend intensive follow-up schedule in patients after piecemeal EMR (lesions 20 mm) with the first surveillance colonoscopy at 6 mo, and the intervals to the next colonoscopy at 1 y, and then 3 y. (Strong recommendation, moderate-quality evidence)
- To assess for local recurrence, we suggest careful examination of the post-mucosectomy scar site using enhanced imaging, such as dye-based (chromoendoscopy) or electronic-based methods, as well as obtaining targeted biopsies of the site. Post-resection scar sites that show both normal macroscopic and microscopic (biopsy) findings have the highest predictive value for long-term eradication. (Conditional recommendation, moderate-quality evidence).
- In surveillance cases with suspected local recurrence, we suggest endoscopic resection therapy with repeat EMR, snare or avulsion method, and consider ablation of the perimeter of the post-treatment site. In such cases, subsequent examinations should be performed at 6–12 mo until there is no local recurrence. Once a clear resection site is documented by endoscopic assessment and histology, the next follow-ups are performed at 1-y and then 3-y intervals. (Conditional recommendation, low-quality evidence)
- In addition to detailed inspection of the post-mucosectomy scar site, we recommend detailed examination of the entir colon at the surveillance colonoscopy to assess for synchronous colorectal lesions (Strong recommendation, moderate-quality evidence)

First Follow-Up in Average-Risk Adults With Normal Colonoscopy or Adenomas

Gupta S et al. GASTROINTESTINAL ENDOSCOPY Volume 91, No. 3 : 2020; 463-485

Baseline (First) colonoscopy finding	Recommended interval for surveillance colonoscopy (years)	Strength of recommendation	Quality of evidence
Normal	10	Strong	High
1–2 tubular adenomas <10 mm	7-10	Strong	Moderate
3–4 tubular adenomas <10 mm	3-5	Weak	Very Low
5–10 tubular adenomas <10 mm	3	Strong	Moderate
Adenoma 10 mm	3	Strong	High
Adenoma with tubulovillous or villous histology	3	Strong	Moderate
Adenoma with high-grade dysplasia	3	Strong	Moderate
>10 adenomas on single examination*	1	Weak	Very Low
Piecemeal resection of adenoma 20 mm	6 months	Strong	Moderate

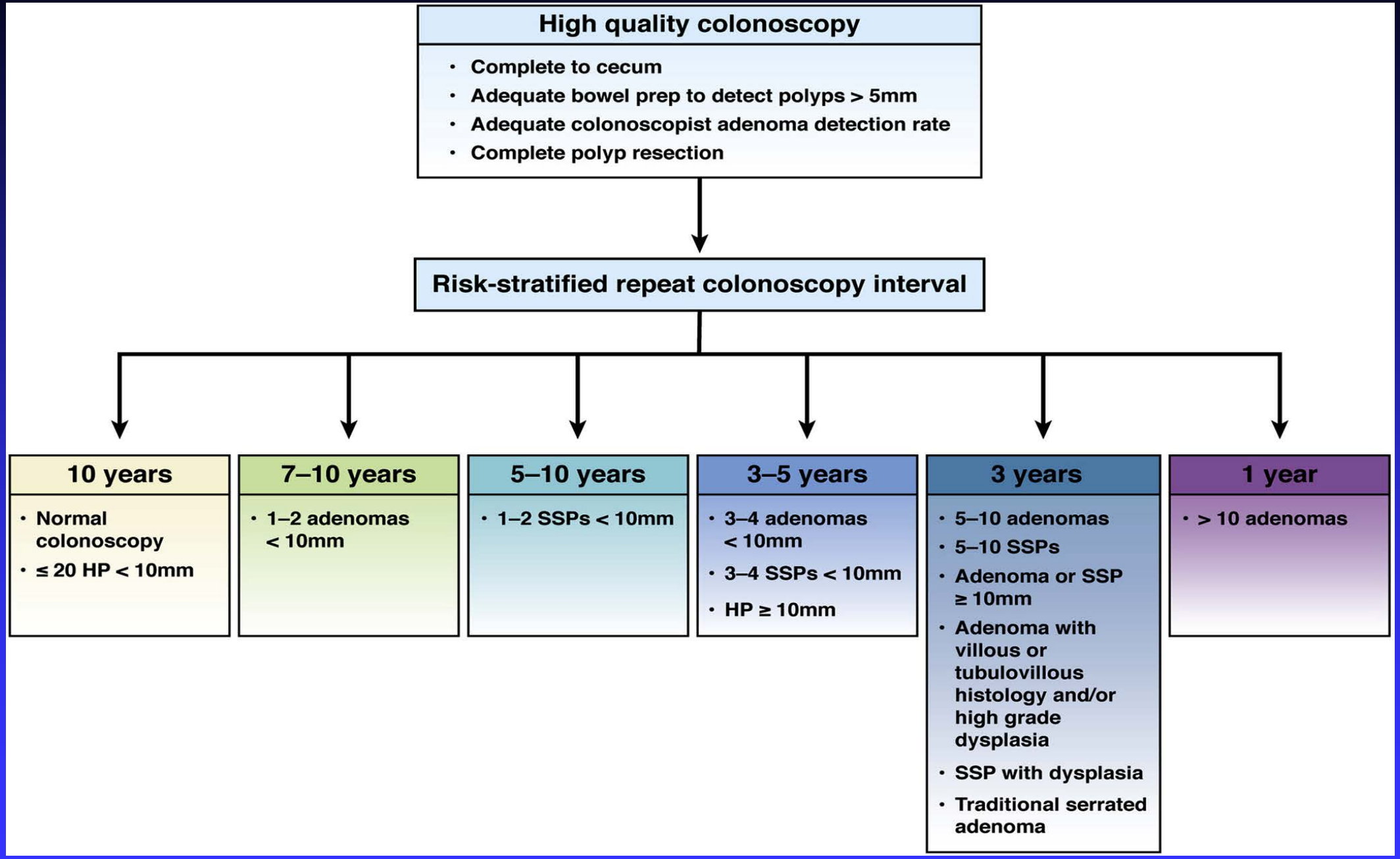
*Patients with >10 adenomas or lifetime >10 cumulative adenomas may need to be considered for genetic testing based on absolute/cumulative adenoma number, patient age, and other factors such as family history of CRC

Recommendations for Post-Colonoscopy First Follow-Up in Average-Risk Adults With Serrated Polyps

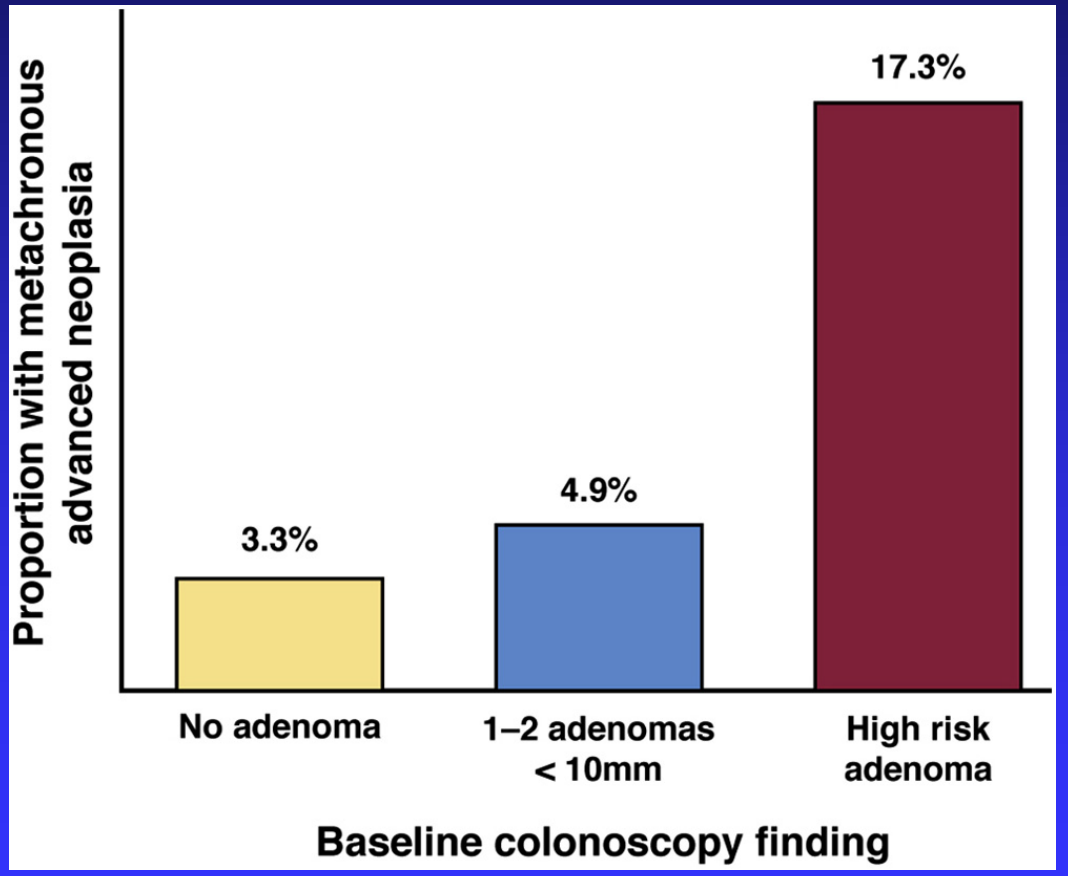
Gupta S et al. GASTROINTESTINAL ENDOSCOPY Volume 91, No. 3 : 2020; 463-485

Baseline (First) colonoscopy finding	Recommended interval for surveillance colonoscopy (years)	Strength of recommendation	Quality of evidence
</= 20 HPs in rectum or sigmoid colon <10 mm	10	Strong	Moderate
</= 20 HPs proximal to sigmoid colon <10 mm	10	Weak	Very Low
1–2 SSPs <10 mm	5-10	Weak	Very Low
3–4 SSPs <10 mm	3-5	Weak	Very Low
5–10 SSPs <10 mm	3	Weak	Very Low
SSP 10 mm	3	Weak	Very Low
SSP with dysplasia	3	Weak	Very Low
HP 10 mm	3-5	Weak	Very Low
TSA	3	Weak	Very Low
Piecemeal resection of SSP 20 mm	6 months	Strong	Moderate

Patients with cumulative >20 hyperplastic polyps distributed throughout the colon, with at least 5 being proximal to the rectum, as well as those with 5 serrated polyps proximal to the rectum > 5 mm, with at least two 10 mm meet criteria for serrated polyposis syndrome and may require specialized management


High quality colonoscopy
• Complete to cecum
• Adequate bowel prep to detect polyps > 5mm
• Adequate colonoscopist adenoma detection rate
• Complete polyp resection
Risk-stratified repeat colonoscopy interval
10 years
• Normal colonoscopy
• ≤ 20 HP < 10mm
7–10 years
• 1–2 adenomas < 10mm
5–10 years
• 1–2 SSPs < 10mm
3–5 years
• 3–4 adenomas < 10mm
• 3–4 SSPs < 10mm
• HP ≥ 10mm
3 years
• 5–10 adenomas
• 5–10 SSPs
• Adenoma or SSP ≥ 10mm
• Adenoma with villous or tubulovillous histology and/or high grade dysplasia
• SSP with dysplasia
• Traditional serrated adenoma
1 year
• > 10 adenomas

Risk of Metachronous Advanced Neoplasia by Index Colonoscopy Findings



Risk for High-Risk Adenoma and Large Serrated Polyps Stratified by Baseline Colonoscopy

(New Hampshire Colonoscopy Registry)

Baseline Colonoscopy Finding	Surveillance Colonoscopy Finding	
	High Risk Adenoma (%)	Serrated Polyp >/= 10 mm (%)
No adenoma	4.8	0.7
Low Risk Adenoma (LRA)	9.7	0.5
High Risk Adenoma (HRA)	18.2	1
LRA + Sessile Serrated Polyp (SSP)	18.4	8.2
HRA + SSP	46.4	3.6
SSP/SS Adenoma	2.9	9.6
HP, SP, or TSA >/= 10 mm	3.1	12.3

Recommendations for Second Surveillance Stratified by Adenoma Findings at Baseline and First Surveillance

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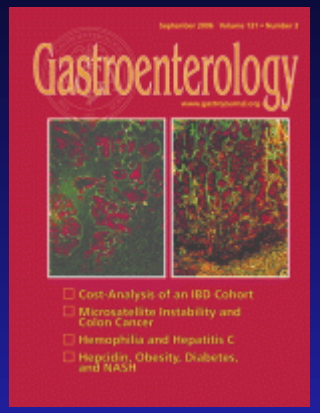
Baseline Finding	First Interval (y)	First Surveillance Finding	Next Interval (y)
1-2 Tubular Adenoma (TA) < 10 mm	7-10	Normal	10
		1-2 TA < 10 mm	7-10
		3-4 TA < 10 mm	3-5
		Adenoma 10 mm in size; or adenoma with tubulovillous/villous histology; or adenoma with high grade dysplasia; or 5–10 adenomas <10 mm	3
3-4 Tubular Adenoma (TA) < 10 mm	3-5	Normal	10
		1-2 TA < 10 mm	7-10
		3-4 TA < 10 mm	3-5
		Adenoma 10 mm in size; or adenoma with tubulovillous/villous histology; or adenoma with high grade dysplasia; or 5–10 adenomas <10 mm	3
-Adenoma 10 mm in size; or -adenoma with tubulovillous/villous histology; or -adenoma with high-grade dysplasia; or -5–10 adenomas <10 mm	3	Normal	5
		1-2 TA < 10 mm	5
		3-4 TA < 10 mm	3-5
		Adenoma 10 mm in size; or adenoma with tubulovillous/villous histology; or adenoma with high grade dysplasia; or 5–10 adenomas <10 mm	3

Additional Surveillance Considerations

- Discontinuation of surveillance should be considered in patients with serious comorbidities with less than 10 years of life expectancy.
- Surveillance guidelines are intended for asymptomatic people; new symptoms may need diagnostic work-up.
- Evolving technologies like chromoendoscopy, magnification endoscopy, narrow band imaging, and CT colonography are not established for postpolypectomy surveillance at this time.



Gastroenterology- 2006 (Vol. 130, Issue 6: 1865-1871)

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

Rex DK, Kahi CJ, Levin B, Smith RA, Bond JH, Brooks D, Burt RW, Byers T, Fletcher RH, Hyman N, Johnson D, Kirk L, Lieberman DA, Levin TR, O'Brien MJ, Simmang C, Thorson AG, Winawer SJ

Candidates for Surveillance

- After surgical resection of Stage I, II, III colon and rectal cancer
- After curative-intent resection of Stage IV cancers
- After endoscopic resection of Stage I
- Patients with unresectable cancer generally not candidates for surveillance

Goals of Postcancer-Resection Surveillance

- Detection of Surgically Curable Recurrence of primary CRC:
  - Annual CXR and CT of Liver
  - Serial CEA, if pre-op was high (?)
- Detection of metachronous neoplasm:
  - Main goal in colon CA prevention
  - Colonoscopy surveillance

Goals of Postcancer-Resection Surveillance

- Surveillance to identify anastamotic recurrence in **rectal** cancer:
  - High rates of local recurrence
  - Proctoscopy and Rectal EUS
- **In RCTs or meta-analyses: Detection of local recurrence of primary colon cancer tumor (anastamotic recurrence) by annual or more frequent C-scope does not confer any survival benefit**

Postcancer Resection Surveillance Recommendations

1. Patients with colon and rectal cancer should undergo high-quality perioperative clearing of synchronous lesions (usually “clearing colonoscopy”).
   - In nonobstructing tumors:
     - preoperative colonoscopy to cecum.
   - In obstructing colon cancers:
     - CT colonography with intravenous contrast or
     - Double-contrast barium enema
   - If no unresectable metastases found during surgery :
     - Colonoscopy to clear the colon of synchronous disease 3 to 6 months after the resection, OR
     - Colonoscopy performed intraoperatively

Gastroenterology- 2006 (Vol. 130, Issue 6: 1865-1871)

Postcancer Resection Surveillance Recommendations

2. Patients undergoing curative resection for colon or rectal cancer should undergo a repeat colonoscopy to detect “early metachronous” lesions:
   - 1 year after the resection (+ pre-op clearing), OR
   - 1 year after the “clearing colonoscopy”

   This colonoscopy at 1 year is in addition to the perioperative colonoscopy for synchronous tumors.

3. If the examination performed at 1 year is normal, then:
   - interval before next colonoscopy should be 3 years.
   - if “3-year post clearing” colonoscopy is normal, the subsequent examination should be in 5 years.

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Postcancer Resection Surveillance Recommendations

4. Following the examination at 1 year, the intervals before subsequent examinations may be shortened if there is evidence of HNPCC or if adenoma findings warrant earlier colonoscopy

5. Periodic examination of the rectum to identify local recurrence, at 3- to 6-month intervals for the first 2 or 3 years, may be considered after low anterior resection of rectal cancer. Techniques:

   - rigid/flexible proctoscopy, or
   - rectal endoscopic ultrasound.

   These examinations are independent of the colonoscopic examinations described above for detection of metachronous disease.

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Post-Colorectal Cancer Surveillance

	Interval from Previous Exam
Clearing Colonoscopy	Before, During, or 3 months After Resection
Post-Clearing Colonoscopy	1 year later
1st Metachronous Surveillance	3 years later
Subsequent Metachronous Surveillance	5 years later, and every 5 years thereafter

Rectal Cancer

Local Recurrence Surveillance After Low-Anterior Resection

(In addition to Colonoscopies)

	Interval	Duration
Rectal EUS or Rigid/Flexible Proctoscopy	Every 3 months	3 years