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# Quality Indicators for Colonoscopy Procedures

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## 1. Introduction

Colonoscopy remains the gold standard for morphologic colon. Despite the development of new methods of morphologic bowel, colonoscopy is still considered the « gold standard » because of its ability at detecting small neoplastic lesions as well as adenomas. Unlike other methods, colonoscopy has the great advantage of carrying out the same time the removal of polyps.

Colonoscopy also has a number of limitations. Studies have confirmed that the colonoscopy examination was an improvement over the performance review that fluctuates depending on the quality of it. Thus Pickardt et al showed that colonoscopy could miss up to 10% of polyps greater than 10mm (1). Also, it should be noted that interval cancers after colonoscopy is not uncommon (2). These results underpin the idea that colonoscopy is an examination of improvement and it is necessary to define quality criteria.

The most famous of all is the detection rate of adenoma. This simple criterion was used to compare the performance of endoscopists (3). To reduce variation between endoscopists and to generalize the practice of colonoscopy quality, we must have reliable and easily measurable criteria for assessing the quality of examinations. These criteria should ensure that consideration is medically justified. It is carried out by using standard validated, that lesions are diagnosed correctly and appropriate treatments are made. All of it should be done with minimal risk to patients. Moreover, these criteria must evaluate the entire examination and not just the technical act. Those criteria must also take into account: the information provided to the patient, risk assessment, and conditions of the act.

Indications for colonoscopy and appropriate intervals have been established by the taskforce in 2006 between the American College of Gastroenterology and the American Society of Digestive Endoscopy (4).

## 2. Quality criteria before colonoscopy

### Indication

Indications for colonoscopy vary by country, particularly in terms of policies in place for colorectal cancer mass screening. In France, in contrast to the USA, screening colonoscopy is not recommended for mass screening, that is to say persons without familial or individual risk factors. But it is recommended for persons in high or very high risk of colorectal cancer.

Colonoscopy surveillance is warranted consideration by the patient's personal history, such as a history of polypectomy for adenoma, or a history of colorectal cancer. In France, diagnosis colonoscopy is justified when there are digestive symptoms or if the screening test (Hemoccult ® test) is positive.

Indications list for colonoscopy must be validated by an expert committee and must be clearly indicated in the report of examination. An audit carried out in France in 2006-2007 has shown that the colonoscopy indication was consistent with the recommendations of the ANAES in 94% of cases (5).

#### Risk factors for complications

Colonoscopy is an examination potentially at risk. This risk must be assessed by endoscopist. Quality criteria should take into account the ground, comorbidity, current treatments include anticoagulant and antiplatelet agents.

Informed consent, including information on risks of the examination must be obtained in all cases. The gastroenterologist, possibly with the assistance of the anesthesiologist must identify possible risk factors related to land and salaries made by the patient, including anticoagulants or antiplatelet agents that need to be managed with the help of cardiologists. (6, 7). It is the same for antibiotic prophylaxis. American Society of Anesthesiologists (ASA) score risk assessment anesthetic could be a simple criterion of evaluation of gesture. ASA score or "Physical status score" was developed in 1941 by American Society of Anesthesiologists. This score assesses both risk of anesthesia and predict mortality and perioperative morbidity. Ideally this score should be briefed on the report of colonoscopy, as well as taking antiplatelet or anticoagulant treatment, and implementation of prophylactic antibiotics.

#### Block and the staff of endoscopy

There were many recommendations on traceability of the material over the past 10 years. This aspect is now under control and regular monthly monitoring. To justify the validity of washing, the date and time of washing equipment must be indicated on the record. Similarly, any use of disposables or not must be indicated on the record with reference material used.

### **3. Quality criteria related to the procedure**

#### The quality of bowel preparation

The quality of the preparation has been a recent development (8). If the quality of preparation for colonoscopy is arguably dependent patients, it does not mean totally independent gastroenterologist. It is the responsibility of preparing gastroenterologist adjusted according to the patient to be considered good bowel preparation in review. (Picture 1a,b,c) The gastroenterologist must explain why the patient issues of preparation is mandated and how to get a good preparation of the colon. The impact of colon cleanliness assessment on endoscopists' recommendations for follow-up colonoscopy has been evaluated by Ben-Horin et al (9). They showed that clinical evaluations of the colon cleanliness vary considerably among endoscopists. Also, poor preparation exhibited at risk of missing lesions (10), to extend the duration of the examination and have an incomplete review. This might explain in part the observed differences in performance between endoscopists. The type of bowel preparation used, and any difficulties encountered by the

patient to prepare (nausea, vomiting, failure to take prescribed amount in full) should be included in the record review. It would take them into account when the next review, and avoid the failures of preparation at the 2nd colonoscopy (11).

The difficulty is that there is no standardized system for evaluating the quality of preparation, to define what an inadequate preparation, and at what point should repeat the test. It was shown that while 23.4% were deemed unprepared colons by endoscopy, colonoscopy was considered to redo that 6% of cases (11). In other cases insufficient preparation of the colon, are known to gastroenterologists tend to shorten the interval between examinations (9), without, however, this attitude has not been validated (12). Another difficulty is the subjective nature of interpretation. While it is well established that the same preparation can be evaluated differently by endoscopists (9), it is interesting to note that endoscopists with the best performance are generally the most demanding quality the bowel preparation (13).

#### The rate of complete colonoscopy

A colonoscopy is called complete when the endoscope has reached the cecum. We can be certain of having reached the lowest depths when cecal ileocecal valve and appendiceal orifice was clearly visualized. In case of doubt, the valve must be crossed. Reaching the bottom caecum should be stipulated in the record review.

The average rate of complete colonoscopy must be calculated annually by the gastroenterologist and / or the endoscopy unit to which he belongs. According to U.S. guidelines, the rate of complete colonoscopy should be above 90%, and 95% for colonoscopy screening (4). The reasons for the failure of cecal intubation should be included in the report. It may be the poor quality of bowel preparation, technical difficulties related to the anatomy of the colon, the existence of a marked diverticulosis, sedation insufficient, or because of stenosis.

#### The detection rate of adenomas

This is the best criterion for quality of colonoscopy, because it is the purpose of this examination to diagnose and to resect colorectal neoplastic lesions. According to U.S. guidelines, the detection rate of adenomas should be greater than or equal to 25% in men and 15% of women submitting to a first screening colonoscopy after 50 years (4).

Recently, the detection rate of adenoma has been recognized as the main criterion of quality of colonoscopy. Similarly, the authors acknowledge that this criterion of quality allowed to decrease the risk of interval cancer (14).

The detection rate of adenomas is an indicator still difficult to be applied by all gastroenterologists or all endoscopy centers, for histological data are not available at the time of writing minutes of colonoscopy. Circumvent this difficulty involves the availability of suitable software to return to reporting and enrich it with pathological results. A standardization of this test is possible with a possible justification for the quality of the endoscopist by this single criterion like the "pay-for-performance" in force in the U.S. (15).

#### The time of withdrawal of the endoscope

It is the study of Barclay et al. (16) which attracted particular attention on the relationship between detection rate of adenomas and time of withdrawal of the endoscope. The authors reported detection rates of adenomas among endoscopists significantly different according to whether they had a withdrawal time greater or less than 6 minutes. The withdrawal time was used as a quality criteria and is now consider as a criteria in colonoscopies without injury.

This study confirmed the work from the Mayo Clinic showed that 50% of polyps were diagnosed an average withdrawal time of 6.7 minutes, and 90% of polyps to a withdrawal time of 12 minutes (17). A recent observational study conducted among 315 gastroenterologists practicing in 17 U.S. states has confirmed the results of Simmons et al. study, showing that those with an average withdrawal time equal to 6 min detected 1.8 times more polyps than other (18).

A different question is whether the application of rule 6 min. is likely to improve the performance of endoscopists. A work of Barclay et al. (19) has responded positively to this question. He was asked to 12 endoscopists to have a withdrawal time of at least 8 minutes, that is to say, look for at least 2 minutes each of four segments: right colon, transverse, left, and rectosigmoid. The performance obtained after introduction of the recommendations were compared to those recorded during a previous period. In this study it was observed significant increase in performance of endoscopists in terms of rate of colonoscopy with adenomas, number of adenomas or advanced adenomas by colonoscopy (19). Conversely, a study group in Boston has shown that the establishment of an institutional policy requiring a withdrawal time equal to 7 minutes did not alter the performance of a group of 42 endoscopists performing more than 23,000 colonoscopies (20). Another study of 43 gastroenterologists in two cities in Minnesota concluded the same way the lack of improvement in performance over time despite awareness programs (21).

Moreover, the interpretation of an average time is difficult when performing colonoscopy. It is therefore useful to estimate its average withdrawal time as recommended by the American College of Gastroenterology (4) but do not consider the withdrawal time of less than 6 minutes in a patient as a cry of poor quality examination. The threshold is an average of 6 minutes, and not a criterion required for each examination. If the withdrawal time is not longer a guarantee of performance, it is nevertheless witnessed a conscientious and thorough examination, and is likely to improve its performance. In total, if a withdrawal time of less than 6 minutes should not be considered at the individual level as a criterion of poor quality, a time longer than 6 minutes may be a factor in favor of a careful examination and quality. For this, the withdrawal time of colonoscopy and the total time of the review should be indicated on the record.

#### The Record Review

It must contain certain information relating to prior colonoscopy criteria (indication, sedation, quality of preparation, ASA score, total time of examination, removal time and comorbidities), information relating to the review (cecal intubation, number of polyps sized location, treatment biopsies), but also information on the after colonoscopy (what to do, operative risk). Lesions should be described precisely (number, location, shape, size).

#### Complications

Serious complications of colonoscopy such as perforation, or those of endoscopy in general, should be regularly recorded by endoscopy center, and be discussed. Immediate complications are easily identified in the report of the review.

The latest series of the literature showed that the rate of perforation secondary to colonoscopy is currently the order of 1 case of perforation from 1000 to 1400 examinations (22). Lower rates (1 per 4900 examinations) have been reported recently in Germany in a series of 269,000 colonoscopies (23). Three quarters of the perforations are diagnosed immediately or early (<24 hours) (22). Achieving a gesture of polypectomy increases the risk

of perforation by a factor more than the polyp is located on the right colon and the size of the polyp is greater than 1 cm (22, 24). In cases of perforation during endoscopy, endoscopic treatment should be considered with endoscopic clipping (25, 26).

*The quality of postmarketing surveillance review*

Recommendations for future monitoring of the colon usually are not included in the minutes of the colonoscopy, because of lack of histological findings at its completion. When the patient is discharged, an appointment with the doctor should always be given if biopsies were performed in order to communicate the results to the patient. Following this consultation, a report must be sent to the doctor recalled the reason for the colonoscopy, the findings of the examination and histological results. This letter must be concluded with recommendations concerning monitoring (the next review date) and the necessary treatment.

Items dependent on the colonoscopy procedure	
<i>(included systematically in colonoscopy or pathology reports)</i>	
	Quality of the colonic preparation
	Completeness of the procedure
	Number of adenomas or adenocarcinoma found per procedure
	Colonoscopy difficulty
	Sedation
Items independent of the colonoscopy procedure	
<i>(noted prospectively on colonoscopy checklists)</i>	
	Patient characteristics (specific information about colonoscopy risk determined by the gastroenterologist)
	Information consent about Creutzfeldt-Jakob disease
	Comorbid condition (valvulopathy)
	Treatment with drugs with a bleeding risk:
	Antiplatelets
	Aspirin
	Vitamin K antagonist
	Appropriateness of the colonoscopy procedure (6 items)
	Digestive haemorrhage
	Functional bowel disorder
	Screening colonoscopy
	Digestive symptoms refractory to symptomatic treatment
	Personal history of colon cancer or adenoma or inflammatory bowel disease
	Familial history of adenoma or colon cancer
Quality criteria to analyse post colonoscopy	
	Adenoma detection rate
	Time Withdrawal (Mean upper than 6 minutes)
	Early complications rate
	Late complications rate
	Good preparation rate
	Cecal intubation rate

Table 1. Quality criteria for colonoscopy



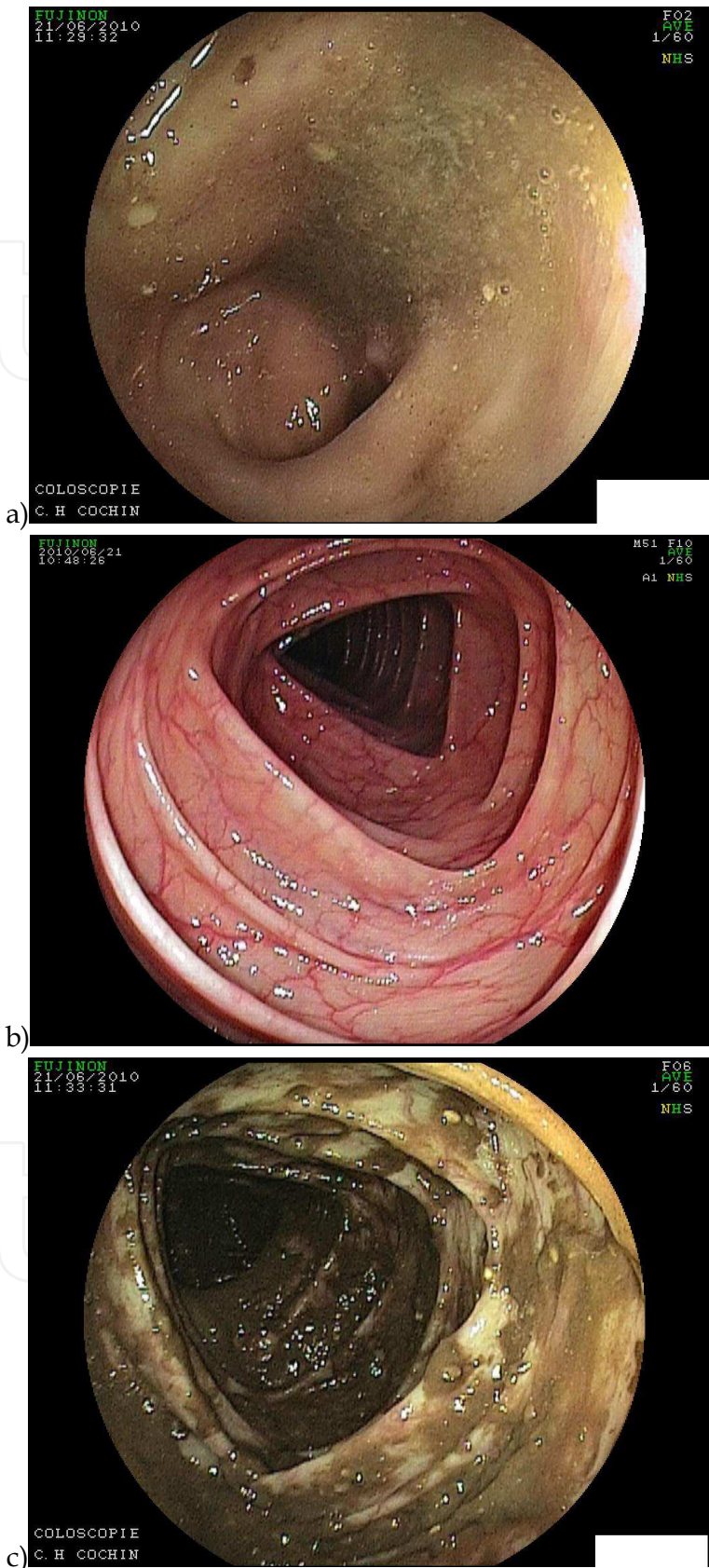


Fig. 1. Photographs depict representative luminal views of colon cleanliness of the large bowel. The cleanliness was not sufficient (a), intermediate (b), and good (c)

#### 4. Conclusion

Colonoscopy is still the gold standard exploration for the colon. But at the present time were new explorations techniques of the colon are developed, it seems important to justify the quality of the review criteria with simple reliable repeatable and standardized. To do this, you have to use reliable indicators that must be systematically integrated into the reporting review. The goal is to choose within the center in a limited number of quality criteria relevant to the population management. Certain criteria now appear unavoidable and must be systematically evaluated (indication of the colonoscopy withdrawal times, patient consent, comorbidities, quality of preparation, cecal intubation, rate of adenoma by colonoscopy, immediate complication).

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