Quality Reporting of Colonoscopy Performance Standards for the Alberta Colorectal Cancer Screening Program

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Table of Contents

Executive Summary

The ultimate goal of the ACRCSP is to reduce mortality from colorectal cancer through early detection while maintaining the highest levels of quality and safety of the screening services. It is well known that accurate and safe colonoscopies are those that meet recognized quality indicators. This document outlines specific quality indicators, their target measures and reporting timelines. Each zone will be responsible for regular reporting of these indicators to their individual colonoscopists. Quarterly summary reports in aggregate fashion from each zone will be forwarded to the Provincial Program. Suggested reporting templates are included. Strategies for physician self-improvement as well as physician up-skilling are outlined**.**

I. Introduction:

The goals of the Alberta Colorectal Cancer Screening Program (ACRCSP) are as follows:

- Short-term (within 2 years) – Develop access, infrastructure and capacity for a provincial population-based colorectal cancer screening program
- Medium-term (within 5 years) – Two-thirds of the target population will participate in the provincial colorectal cancer screening program
- Long-term (within 10 years) – Reduce colorectal cancer incidence by 20% and colorectal cancer mortality by 30% through enhanced prevention and screening

Colonoscopy as part of a screening program has been shown to reduce the risk for the subsequent development of colorectal cancer[1]. However, this protective effect may not extend to right-sided colonic lesions[2,3]. It is increasingly recognized that physician specific factors such as low cecal intubation rates and low adenoma detection rates result in a greater risk for the development of interval cancers[4,5]. While colonoscopy is a safe and accurate diagnostic investigation, it is not a uniformly practiced skill. There are wide variations between colonoscopists in diagnostic accuracy, patient outcomes and complications. Because of this, quality indicators have been developed both to standardize the performance of colonoscopy and to provide pertinent feedback to physicians on their operative performance relative to quality targets. Quality rating scales have also been formulated to better reflect important aspects of the patient experience such as consent, dignity and privacy. While quality measures extend beyond the colonoscopist to include the endoscopy unit itself and the patient experience, the scope of this document is limited to colonoscopist-specific quality measures.

The aim of this document is three-fold:

- To outline quality standards that zonal programs/colonoscopy services affiliated with the Alberta Colorectal Cancer are expected to track for each participating colonoscopist
- To detail the reporting structure that will be required from each Zone on quality targets
- To suggest strategies for quality improvement for individual endoscopists

II. Rationale:

It is intuitive to most colonoscopists that a high quality exam is one where:

- The cecum is reached
- Careful examination of the entire colonic mucosa is carried out
- Complete removal of all neoplastic lesions is accomplished.

These factors assume that the procedure is done with good bowel prep, with accurate identification of cecal structures along with sufficient skill to remove all polyps while maintaining patient comfort and safety. There is a growing body of evidence that high quality colonoscopies are associated with enhanced patient satisfaction, improved patient safety, and a reduced risk for subsequent colorectal cancer development. In a recent study, a threshold adenoma detection rate (ADR) was identified such that ADRs below that threshold were associated with a significantly increased risk of subsequent interval cancer cases [6]. Physician specific factors such as a withdrawal time greater than 6 minutes are correlated with a higher ADR and a reduced risk for interval cancers[7,8]. In terms of patient safety, there is an inverse correlation between annual colonoscopy volume and complication rate (bleeding or perforation). It appears that a threshold of approximately 300 colonoscopies per year is the level at which postoperative complications decrease[9].

Thus, it is clear that there are a number of modifiable factors that can serve to both enhance diagnostic accuracy for adenomatous polyps of the colon and improve patient safety. These factors are evidence-based, easily measurable, and present an ideal opportunity for the use of a quality improvement process to ensure physician uptake and implementation.

A quality improvement process requires the following steps:

- Definition of an easily measured evidence-based quality indicator (e.g. Cecal intubation rate)
- Measurement of the quality indicator in comparison to a predefined target level of performance
- Tabulation and feedback of performance to the individual colonoscopist
- Collaborative encouragement, advice and training provided to the colonoscopist in order to improve performance
- Re-measurement of the quality indicator to monitor the impact of changes
- Ongoing maintenance of standards and measurement of outcomes

These steps assume a data infrastructure capable of measuring specific colonoscopy performance indicators in a reliable, auditable and regular fashion. The use of a

standardized procedure report (synoptic reporting) and tabulation in a standardized database permits relevant data extraction in a standardized way. Currently available proprietary software (e.g., Endopro, Endoworks, CORI) may be tailored to suit this purpose, pending the availability of a fully standardized and truly synoptic reporting system. A centralized repository of the synoptic reports will aid in analysis and reporting.

III. Physician Qualifications:

Individuals consenting to screening in zonal programs/colonoscopy services associated with the ACRCSP are relatively healthy individuals without gastrointestinal symptoms. While all endoscopic complications have negative consequences, it may appear subjectively worse to have a complication or poor quality examination in an individual presenting for screening. Thus, physicians invited to participate as colonoscopists in the program must bring adequate training, skills and attitudes commensurate with the high quality standards required by the screening program.

Participation in the ACRCSP will be limited to those physicians who meet the following criteria:

- Current licensure with the Alberta College of Physicians and Surgeons
- Completion of a rigorous training program encompassing all aspects of colonoscopy including polypectomy as part of a Fellowship in either Gastroenterology or in General Surgery as recognized by the Royal College of Physicians of Canada.
- Extensive clinical experience of more than 500 previous colonoscopies
- Demonstrated proficiency in polypectomy
- Annual colonoscopy volume of more than 200 colonoscopies per year
- Willingness to engage in the Quality Improvement Program and consent to undergo up-skilling courses if required.
- Competency to administer conscious sedation
- It is recognized that practitioners outside of these criteria have also received training in digestive health and endoscopy and are currently doing colon cancer screening in the province (e.g. select family physicians, general internists, nurse practitioners). It is recommended that each zone access the credentials of these individuals on a case-by-case basis.

Given the primary emphasis on accuracy and safety of colonoscopy for screening cases, it is not appropriate for residents or other endoscopy learners to participate in these procedures.

IV. Development of Quality Indicator Standards and Targets

This document and the specific quality indicator elements were developed in collaboration with the ACRCSP Quality Working Group. This group consisted of representatives from gastroenterology, colorectal surgery, family practice, and zonal screening program managers (see Appendix 4) . Quality indicators and their target values were selected based on current levels of evidence as well as an assessment of the current feasibility given varying levels of IT infrastructure support in each zone. In some cases, selection of target values was somewhat arbitrary given the current lack of uniform definitions and program experience that applies to the Alberta landscape. Best guess estimates were used recognizing that these values will change over time with increasing experience and expansion of scientific knowledge.

V. Description of Specific Colonoscopy Quality Indicators

The specific Quality Indicators are outlined below (also see Table 1). The Minimum Standard is based on the best medical literature currently available and is the expected performance measure for each colonoscopist/zone program. The Target Goal is the target towards which all colonoscopists/zone should be working to achieve. The precise calculation method is detailed in the text.

Completion of endoscopy reports in synoptic format

Objective: To ensure adequate and accurate recording of relevant procedural parameters and provide a source for extraction of quality data elements.

Minimum standard: 95% of procedures reported using a standardized synoptic report. Ideally, this should be done using an electronic reporting tool such as Endoworks or EndoPro. However, not all screening sites in the province have access to this software. In

these situations, a standardized dictated report using a dictation template will suffice. Manual data capture and entry into a database will be required.

Calculation method: For each individual endoscopist = #of procedures reported in synoptic format/Total # of procedures performed per reporting period.

Comments: The institution of a quality measurement program is predicated on accurate and valid colonoscopy reports for all patients. Thus, all colonoscopies carried out for CRC screening purposes should be reported in a standardized way using a synoptic reporting structure. The procedural report should include details on informed consent, procedural indication and important patient comorbidities. Important patient historical details should also be included (previous colonic surgery, previous colonic disease, previous: the polyps or adenocarcinoma). Precise details regarding the procedure including bowel preparation quality, polyp removal and other diagnostic findings must be included. Use of commercial electronic reporting software such as Endoworks or EndoPro facilitates the use of standardized reporting fields and the ability to capture photographs of important landmarks such as the cecum and retroflexion views of the rectum.

Data Source: From Endoworks, EndoPro or zonal synoptic dictation templates.

Assessment of bowel prep quality:

Objective: to ensure that the bowel preparation quality is sufficient to maximize detection of colonic lesions. Poor bowel preparation is associated with failure to reach the cecum[10] and also impacts on ADR and follow-up recommendations for survaillence[11]

Minimum standard: 95% of colonoscopy reports should contain an assessment of bowel preparation quality

Calculation method:

For each individual physician: **Assessment of Bowel Prep Quality = # of colonoscopies where the bowel quality is recorded / Total Number of Colonoscopies per reporting period.**

Comments: A simple 3-4 point system is recommended such as: 1) Adequate to visualize polyps greater than 5 mm 2) Adequate with washing 3) Inadequate

Older rating scales such as the Boston or Ottawa scale are intended for research purposes and are too cumbersome to use in routine clinical practice. It should be noted that bowel preparation quality is a system issue and the individual physician endoscopist is not held accountable for the quality of bowel preparations in the patients on whom he/she performs a colonoscopy. However, it is expected that each colonoscopist will rate the quality of the bowel preparation in accordance with the rating scale and record it in

the synoptic colonoscopy report. The rating should reflect the procedural visibility after attempts at washing the colonic mucosa have been done.

Data source: Ideally from the physician operative (synoptic) report and the nursing record. However, some zones are currently recording this also in the nursing theatre record. Cross-referencing physician and nursing records could carry out audit of the veracity of this data.

Cecal intubation rate

Objective: to ensure that the colonoscopist adequately visualizes the entire colonic mucosa including the cecal base.

Minimum standard: > 95% of colonoscopies performed by an individual colonoscopist reach the cecum.

Calculation method = # of cecal intubation events/ # Total number of colonoscopies attempted per reporting period. This quality indicator should be calculated on an individual basis for each colonoscopist. Note: this rate should not be adjusted for technical problems such as colonic strictures, poor bowel prep or equipment failure. Where there is ability to record or print endoscopic pictures, a cecal intubation event should be confirmed by photo-documentation of the cecal base. At least 2 photographs should be taken to provide views of structures such as the appendiceal orifice, cecal strap, ileocecal valve and terminal ileum. Where photo-documentation is not available, cecal intubation can be confirmed by:

- Endoscopy nurse verification that cecal intubation has occurred (documented in the nursing record). Disagreement between physician and nurse over whether the cecum has been reached should be resolved before proceeding further with the case.
- Physician self-reporting of the cecal landmarks identified within the operative report. In cases of discrepancy between nursing and physician records, the physician record will be taken as the source or truth.

Comments: Given the importance of this quality indicator, photo documentation of the cecum will require periodic audits of the photographic quality to ensure accurate representation of the cecal structures. It should be noted that terminal ileal intubation does not in and of itself prove adequate visualization of the cecal pole. Biopsies of the TI solely for documentation purposes are to be discouraged (due to cost and possible complications). Multiple expert groups including Cancer Care Ontario, the American

Society of Gastrointestinal Endoscopy and the US Multi-Society Task Force on Colorectal Screening all recommend a cecal intubation rate of >95% for screening cases[12-14].

Polyp detection rate

Objective: Accurate identification and removal of all pathological lesions during screening colonoscopy. This measure serves as a surrogate marker for the Adenoma Detection Rate.

Minimum standard: For this indicator, no minimum standard was set by the Quality Working Group due to current lack of evidence on patient outcomes and inconsistency in definitions.

Calculation method: # of colonoscopy cases with at least one polyp was biopsied or removed/Total # of screening colonoscopies

Comments: This indicator refers to the proportion of colonoscopies in which a polyp is identified with the polyp either biopsied or removed. It is expected that endoscopists will use their clinical judgment to determine if a polyp requires removal or biopsy. For example, small hyperplastic appearing polyps in the rectum do not require removal. It is well known that large variance exists between colonoscopist in their ability to detect polyps and adenomas. Colonoscopists with low polypectomy rates have higher rates of missed colon cancers[4]. The committee elected to reserve judgment on a minimum standard number given the uncertainty over the utility of this measurement and the lack of consistent standards in other screening programs. Tandem studies (either with repeat colonoscopy or with CT colonography) demonstrate a miss rate for advanced adenomas of up to 6% and 27% for smaller lesions[15]. Improved physician technique can dramatically enhance polyp detection rate. Polypectomy rate is less cumbersome to calculate than the ADR and is a reasonable surrogate marker for pathology detection during colonoscopy[16]. For national reporting purposes, CPAC has identified a related quality indicator: Proportion of colonoscopies in which material was sent for pathology.

Data Source: From physician report on Endoworks/EndoPro or from zonal synoptic dictation templates. Data audit for accuracy could be done by a correlation between physician reporting and actual specimens submitted for pathology.

Adenoma detection rate:

Objective: to ensure that all pathological lesions within the colon are removed during screening colonoscopy

Minimum standard: Currently, minimum standards vary by patient population screened and by jurisdiction. The minimum standard will depend on gFOBT vs. FIT,

average risk vs. family history. Some representative jurisdictions and their standards are outlined below:

- UKBCSP: gFOBT (4/6 windows pos) – minimum standard ADR 35% and target 40%
- Nova Scotia: FIT: Target ADR – 50%
- Manitoba: gFOBT: Target ADR – 35%

Based on the above, for FIT positive cases, the Quality Working group has set the Minimum Standard ADR at 35% and the Target ADR at 40%.[1]

Calculation method: # of colonoscopy cases in which an adenoma was removed/ Total # of colonoscopy cases (done for a positive FIT or family history of CRC)
ADR's for each reporting period should be calculated for each physician on an adequate number of colonoscopies (at least 100).

Comments: Screening for colorectal cancer is built upon the premise that colonic adenomas are the precursor lesion for malignancy. Early detection of adenomatous polyps is the goal to prevent subsequent malignant degeneration. Thus, accurate detection and removal of adenomatous colonic polyps is a key indicator of colonoscopy quality. For simplicity of analysis, sessile serrated adenomas (SSA's) and traditional serrated adenomas (TSA's) will be included along with all other adenomas. Currently, there is a wide variance among colonoscopists in their adenoma detection rates[17]. It is known that colonoscopies with low ADRs, have a higher rate of missed or interval: cancers than those with high ADRs[6]. The US Multisociety Task Force recommends an ADR of >25% for men and >15% for women in individuals undergoing a first time screening colonoscopy[14]. However, these figures apply to average risk screening colonoscopy. ADR's for colonoscopies done for family history or positive FOBT / FIT test are likely to be higher. In polyp removal, it is expected that clinicians will utilize up to date techniques including the judicious application of electrocautery, avoidance of hot biopsy forceps and use of tattoo ink to mark the location of suspicious lesions.

Data source: Linking will be required between pathology reports and physician reporting. Initially this will require manual retrieval of pathology reports and correlation with synoptic data in Endoworks/EndoPro or zonal dictation templates.

[1] This number will depend on the type of FIT test eventually used in the province and the threshold level for positivity. The number may change over time with greater clinical experience in the program.

Polyp retrieval rate

Objective: To ensure that all polypoid lesions detected at colonoscopy with an attempt at polypectomy are retrieved and submitted for histological evaluation

Minimum standard: >90%

Target standard = 99%

Calculation method: # of polyps submitted for pathological review /# of polyps detected with polypectomy attempt.

Comments: Colonic polyps are normally removed with biopsy forceps, or polypectomy snares - with or without electrocautery. During the course of polypectomy, it may be difficult to retrieve the polyp either because of fragmentation or loss in colonic fluid. All reasonable attempts should be made to retrieve the polyp and submit it for pathologic evaluation in separate containers with the anatomical location in the colon clearly specified. It is acceptable for multiple small polyps from the same location can be submitted in the same specimen container. The histologic polyp classification (adenoma, serrated adenoma, hyperplastic or other) directly impacts upon future surveillance intervals. If resected polyps cannot be retrieved, the reason should be documented in the operative report (for example, a small polyp may have been completely obliterated by the electrocautery process). Large polyps that are removed in piecemeal fashion should be retrieved as much as possible and placed in the same specimen container. Note should be made in the operative report if fragments could not be retrieved and were left behind for technical reasons. Note: this quality indicator is not intended to apply to instances where the specimen has retrieved but lost in transport between the endoscopy suite and the pathology lab.

Data Source: From physician report on Endoworks/EndoPro, or zonal synoptic dictation templates. Data audit for accuracy could be done by a correlation between physician reporting and actual specimens submitted for pathology.

Colonoscopy withdrawal time (CWT).

Objective: to encourage high quality withdrawal technique; thereby enhancing detection of pathological lesions

Minimum standard: > than 6 minutes for all negative colonoscopies

Target Standard: > 8 minutes

Calculation method: For all colonoscopies in which **no** lesions are detected, the **CWT = Time at which the anus is reached (hh:mm) – time at which withdrawal from cecum commenced (hh:mm)**

Comments: There is increasing evidence for a linear relationship between colonoscopy withdrawal time and the Adenoma Detection Rate. Several studies have demonstrated that a withdrawal time greater than 6 min. had a significantly higher detection rate than with shorter withdrawal times[18-20]. More recent evidence suggests that interventions designed to encourage longer withdrawal times were associated with enhanced ADR's[21,22]. However, it is important to recognize that withdrawal time is only a surrogate marker for excellent withdrawal technique (i.e. looking behind each fold, inflating adequately, suctioning fluid and washing off debris, dynamic patient position changes upon withdrawal[23], using antispasmodics[23]).

Data Source: times for start of withdrawal from cecum and time when anus is reached will be retrieved from the bedside nursing record. The endoscopist will also be asked to state his withdrawal time as part of the Endoworks report. However, the nursing record will be considered more accurate.

Rectal retro-flexion rate

Objective: to ensure that the distal most aspect of the rectum is adequately visualized

Minimum standard: 95%

Calculation method: **# of retroflexion events/# total number of colonoscopies**

Comments: The distal most aspect of the rectum is a blind spot for the colonoscopist when viewed end-on. To ensure that the entire colonic mucosa is visualized down to the dentate line, retroflexion of the colonoscope in the rectum is required. Ideally, a photograph should confirm the view of the dentate line and distal most colonic mucosa. In some patients, retro flexion is not possible either due to adhesions from previous surgery, small pelvis, or significant rectal sensitivity to distention. However, these cases should be less than 5% in total.

Data Source: Physician self report in Endoworks/EndoPro (ideally confirmed with photograph) or zonal dictation templates.

Safe sedation practice

Objective: to minimize harm to screening population from over sedation

Minimum standard: <1% requirement for sedation reversal.

Calculation method: # of cases in which reversal agents (flumazenil/naloxone) or respiratory support were required/ total number of cases

Comments: Sedation in endoscopy is a balance between patient comfort and patient safety. Respiratory depression is a common consequence of intravenous narcotic analgesia or propofol induced moderate sedation. Thus close monitoring of vital signs and pulse oximetry is required at all times. Most cases of drug-induced hypoxia can be managed with stimulation, supplemental oxygen and jaw thrust. However, pharmacologic reversal should be given promptly if these simple measures fail to improve the patient's status. More aggressive airway support equipment with Ambu bag and oral-tracheal intubation should be readily available in the endoscopy theater.

Data Source: Physician self report in Endoworks/EndoPro/anesthetic record and nursing notes. Audit of data accuracy can be used to cross-reference with theatre nursing records.

Assessment of patient comfort score

Objective: to ensure an optimal patient experience during colonoscopy

Minimum standard: Less than 10% of cases with a NAPCOMS score = 6 or more

Calculation method: # cases with a NAPCOMS score of 6 or higher/Total Number of Cases per reporting period.

Comments: It is suggested that the NAPCOMS scoring system for patient comfort be used for all screening cases (see Appendix 2). Using this rating scale, the minimum score is 0 (little or no discomfort) and the maximum score is 9 (frequent, severe, prolonged discomfort). When a score of 6 or more is reached during the procedure, reassessment of scope technique (air insufflation, scope angulation or looping), patient position and drug dose should be carried out by the nurse and physician. If a score of 9 is reached, consideration should be given to stopping the case, unless a readily reversible cause for patient discomfort is found. Patient comfort is a function of endoscopist skill with the avoidance of looping and over-inflation as well as the judicious use of sedative agents. Rolling the patient onto their back when the descending colon is reached, as well as the use of the water lavage technique will enhance patient comfort.

Data Source: From theatre nursing records. Theatre nurse performs rating. NAPCOMS score.

Immediate adverse event rate

Objective: To measure immediate patient adverse events as a result of screening colonoscopy.

Minimum standard: Perforation and significant bleeding rate <1/1000 procedures. This rate is the standard number quoted by most screening programs. However, each case of

perforation or significant bleeding should be reviewed to determine in retrospect if any reversible factors were present which could have prevented the occurrence.

Calculation method: Each regional program will be responsible for determining the tracking measure that is feasible given IT infrastructure and clerical support. Hospital separations data and transfusion records can be utilized to develop an adverse event monitoring system.

Comments: As in any invasive procedure, adverse patient event's can occur. In the setting of colonoscopy, colonic perforation and post-polypectomy bleeding are of significant concern. Perforation can result from over inflation of the colon, mechanical trauma in negotiating through complex loops or due to complications of polypectomy. Colonic bleeding as well usually occurs in the setting of polypectomy. Most commonly, the amount of blood loss is trivial but can be severe requiring transfusion and hospitalization. According to Canadian data the pooled rates of colonoscopy-related bleeding and perforation were 1.64/1000 and 0.85/1000, respectively[9]. However, this data was not restricted to screening colonoscopies. Post-polypectomy bleeding can occur up to 14 days post polyp removal, however the majority of events occur within 7 days.

Date Source: Endoworks, EndoPro, nursing records, hospital admissions data, NETCARE, Safety Learning Reports.

Table 1. Quality Indicators: minimum standards and target goals

Quality indicator	Data Source	Minimum Standard	Target Goals
Completion of Valid Colonoscopy Report	Endoworks, EndoPro, zonal synoptic dictation template	95% of Reports Completed in Synoptic format	99%
Assessment of bowel prep quality	Endoworks, EndoPro, zonal synoptic dictation templates, procedural nursing notes	95% of procedures have bowel prep quality recorded in synoptic report	99%
Cecal intubation rate	Endoworks, EndoPro, Photo—documentation, zonal synoptic dictation templates	> 95%	98%
Polyp detection rate	Endoworks, EndoPro, zonal synoptic dictation templates	Not set by QWG	Not set by QWG
Adenoma detection rate	Endoworks, EndoPro, zonal synoptic dictation templates	For FIT Positives >35%	For FIT Positives >40%
Polyp retrieval rate	Endoworks, EndoPro, zonal synoptic dictation templates, pathology reports	> 90%	99%
Colonoscopy withdrawal time	Nursing procedural notes, Endoworks, EndoPro	> 6 min.	>8 minutes.
Rectal retroflexion rate	Endoworks, EndoPro. Photo—documentation. Zonal dictation templates.	>95%	Not set by QWG
Safe Sedation practices	Endoworks, EndoPro, sedation and nursing record	<1 % requirement for sedation reversal	<1 % requirement for sedation reversal
Patient Comfort Score	Nursing Procedural Notes	Less than 10% of cases with NAPCOMS score = 6 or more	Not set by QWG
Immediate Adverse Event Rate (bleeding, perforation, other unplanned)	Endoworks, EndoPro, nursing procedural notes, NETCARE, hospital separations data.	<1 per 1000	<1 per 1000

VI. Reporting Timelines and Methodology

Detailed measurement of quality indicators without reporting, feedback and efforts to improve performance is a fruitless exercise. Quality metrics need to be compared to an objective standard with regular and timely feedback to physicians in a collaborative fashion to identify areas for improvement. It is suggested that each zone report quality indicators back to individual physicians on a quarterly basis. The ideal report will compare specific quality measures to those of their peers, to the minimum standard and to the target standards. A suggested physician feedback template is available in Appendix 2. In addition, it is expected that each zone will report aggregate physician specific quality indicators on a

quarterly basis to the Quality Lead of the ACRCSP. A suggested Zone Reporting Template is found in Appendix 3. This aggregate data will be used to identify areas where specific resources (educational, financial) are required to address gaps in provision of quality colonoscopy. As well, this data will also be used for reporting to the Canadian Partnership Against Cancer, which maintains a national database on colon cancer screening performance.

Some quality indicators are more easily measured than others. For example, assessment of bowel prep quality is a simple count while the adenoma detection rate requires a linkage between the synoptic operative report and the pathology report for each case. Resources to carry out these analysis will vary between zones and for this reason, it is recognized that some zones will not be able to report on all quality indicators. However, all zones are encouraged to report and utilize the data that they do have.

VII. Improvement of Physician Quality Performance

Regular assessment of colonoscopy performance quality indicators will most likely identify endoscopists who fail to meet one or more quality targets. Review and feedback on quality indicator reports is the responsibility of the Zone Medical Lead for the ACRCSP. Most lapses in colonoscopy quality are related to easily correctable factors such as time pressure, inattention, and forgetfulness. Scope withdrawal time, polyp detection rate, assessment of bowel prep quality, and rectal retro flexion rate are all examples of quality indicators that should easily respond to feedback from the Zone Medical Lead.

However, other quality indicators are more resistant to change and these are usually the result of inadequate skill and/or training. Examples of this are a low cecal intubation rate, unsafe sedation practice and a high immediate adverse event rate. Where there is evidence of failure to meet these quality and safety standards, participating physicians will collaborate to address quality and safety standards. This process could include quality audits, peer mentoring and remedial training in a recognized upskilling program such as Train the Trainer. Education and remediation of colonoscopist quality issues is primarly the responsibility of each Zone screening program. The ACRCSP will facilitate escalation of unresolved quality issues..

It should be noted that information regarding individual physician quality performance is confidential and collecting this information is subject to approval of the ACRCSP PIA. Data on individual physicians will not be provided to the ACRCSP from the Zone in individual identifiable form. Only specific individuals within each Zonal program will have access to individual Quality Indicator data:

- Zone ACRCSP medical lead
- Zone GI/General Surgery Lead and/or Zone Director of Endoscopy Services

VIII. Future Considerations

The ultimate goal of the ACRCSP is to prevent colorectal cancer in a way that does not produce excess patient harm. The following patient outcomes are relevant to the screening program but will require further validation and linkage of multiple databases to obtain an accurate assessment of effect:

- **30 day post-colonoscopy mortality rate:** colonoscopy could theoretically be associated with excess mortality not only due to the possibility of perforation and bleeding but also to the preparation process which includes the potential for fluid and electrolyte imbalance. Patients are also asked to come off their anticoagulant drugs and alter their diabetic management. These factors may contribute to increased risk of mortality over baseline. Complete assessment of this outcome is ultimately essential but will require linkage between the ACR CSP patient database and Alberta Vital Statistics.
- **30-day post-colonoscopy admission rate:** post colonoscopy perforation and bleeding are usually recognized immediately following the procedure. However, it is well known that perforation and bleeding, particularly in the setting of polypectomy, can be delayed by as much as 5 days. In order to calculate this this measure, linkage will be required between the ACRCSP patient database and provincial hospital separations data.
- **5-year interval cancer rate:** An interval cancer is a colonic malignancy that is identified from one to 3 years after a colonoscopy. These cancers or their precursors are presumed to have been missed at the time of the screening colonoscopy. This is the ultimate measure of poor colonoscopy quality. Measurement of this variable is complex and will require linkage between the ACRCSP patient database as well as the Alberta Cancer Registry and provincial hospital separations data.

Appendix 1: Nurse Assessed Patient Comfort Score (NAPCOMS)

Patient:

Nurse Rater: _____

Domain	Item	0	1	2	3	Score
Pain	**1 - Intensity**	None or minimal	Mild	Moderate	Severe	
	2 - Frequency	None	Few (1-2 episodes)	Several times (3-4 episodes)	Frequent (>4 episodes)	
	3 - Duration	None	Short (episode <30 seconds)	Moderate (episode 30 sec – 1 min)	Long (episode >1 minute)	
	Total Pain Score (Intensity + Frequency + Duration)					
Sedation	**Level of Consciousness**	Alert	Sleepy but initiates conversation	Responds only when asked or stimulated	Unresponsive or only responds with pronounced stimulation	
Global	**Tolerability**	Very well tolerated	Reasonably well tolerated	Just tolerated	Poorly tolerated	

Additional Procedure Information:
Indications for Colonoscopy: _____
Duration of Colonoscopy: _____
Therapeutics or interventions: _____
Sedatives and Dosage: _____

Appendix 2: Colonoscopist Performance Feedback Report Physician Quality Assurance Report

Physician Name:

Reporting Period: August/13 – December/13

Total Procedures for Period: 221

Endoscopist	**Aug-Dec 2013**	**Aug-Dec 2012**	**Zone Average**	**Target[1]**	**Outliner[2]**
Completeness of Synoptic Reporting					
Completed reports:	90.5%	80.5%	50.6%	>95%	
Sedation Practices					
Procedures requiring reversal agent:	0.5%	0.1%	0%	≤1%[1]	
Colonoscopy Findings					
Cecal Intubation Rate	25.8%	26.5%	23%	95%[2]	**
Polyp Detection Rate:	24.7%	25.5%	20.8%	30%[2]	
Average Withdrawal Time (Min):	7.5	5.5	7.1	≥ 6[1]	
Assessment of Bowel Prep	95%			95%	
Patient Comfort Ratings (n=)	136	n/a			
Average Score	3	n/a	2.9		
Proportion cases score > 6	34%	n/a	33%		

Notes:
[1] ACRCSP-defined target
[2] Outlier: * outside the mean + 2 standard deviations, ** falls below ACRCSP

Appendix 3: Quarterly Zone Quality Report

Zone: Reporting Period: August – December

Total Procedures for Period: 2221

	Aug-Dec 2013	**Aug-Dec 2012**	**Zone Average**	**Target[1]**
# Endoscopists in report	13	12		
Completeness of Synoptic Reporting	90.5%	80.5%	50.6%	>95%
Procedures requiring reversal agent:	0.5%	0.1%	0%	≤1%[1]
Colonoscopy Findings				
Average Cecal Intubation Rate	25.8%	26.5%	23%	95%[2]
Average Polyp Detection Rate:	24.7%	25.5%	20.8%	30%[2]
Average Withdrawal Time (Min):	7.5	5.5	7.1	≥ 6[1]
Average Assessment of Bowel Prep Rating	95%			95%
% of cases with inadequate bowel prep				
Rectal retroflexion rate:				
Patient Comfort Ratings (n=)	136	n/a		
Proportion of cases with score > 6	34%	n/a	33%	

Notes:
[1] ACRCSP-defined target

Appendix 4 Colonoscopy Quality Working Group Membership

Alberta Colorectal Cancer Screening Program (ACRCSP)
Colonoscopy Quality Working Group
Terms of Reference- February 13, 2013

PURPOSE
The purpose of Alberta Colorectal Cancer Screening Program (ACRCSP) - Colonoscopy Quality Working Group (CQWG) is to build a colonoscopy quality improvement framework that will include colonoscopy service standards, respective measurements and a plan for ongoing improvement and be local champions of this framework.

The framework will also include a quality assurance component that will propose procedure quality standards of the colonoscopist including credentialing, skill requirements and training.

SCOPE AND DELIVERABLES
The ACRCSP Colonoscopy Quality Working Group will:

- Agree on standards and/or best practice for colonoscopy quality in the ACRCSP.

In this context, "The colonoscopy quality" refers to the diagnostic accuracy and safety of the procedure. In other words, it does not include the quality of the colonoscopy services at large which is one of the deliverables of the ACRCSP Clinical Operations Working Group.

- Agree on quality indicators for colonoscopy service reporting (measurement at zone and provincial level) for the ACRCSP
- Develop a plan for implementing the colonoscopy quality framework and sustainability across the province
- Agree on skills and training standards of the colonoscopist, and respective measurements.
- In addition, develop a credentialing process for colonoscopists participating in screening-related colonoscopy for the ACRCSP

The implementation, ongoing monitoring, maintenance and sustainability of the framework are beyond the scope of this CQWG. The term will end once the deliverables are complete.

TERM OF MEMBERSHIP
The ACRCSP CQWG will begin in February 2013 and deliverables targeted for completion in October 2013.

MEMBERSHIP

Working Group Chair

- Dr. Dan Sadowski, Program Quality Medical Lead-ACRCS

Working Group Co-Chair

- Dr. Catherine Dube, Medical Lead-ACRCSP

MEMBERSHIP (continued)

MEMBER	REPRESENTING
Denise Doenz	Calgary Zone- Colon Cancer Screening Centre- Nurse Educator
Tony Gomes	South Zone- CRS Lethbridge- General Surgery
Robert Hilsden	Calgary Zone- Colon Cancer Screening Centre- Gastroenterology
Mike Kolber	North Zone- Peace River- Family Practice
Barb Moysey	Scope Program- Edmonton – Manager, Primary Care,
Tara Chalmers-Nixon	Calgary Zone- President of ASG-Gastroenterology
Nicole Nemecek	Calgary Zone –Alberta Colorectal Cancer Screening Program-Quality Assurance Nurse

REFERENCES

1. Singh H, Turner D, Xue L, Targownik LE, Bernstein CN. Risk of developing colorectal cancer following a negative colonoscopy examination: evidence for a 10-year interval between colonoscopies. JAMA : the journal of the American Medical Association 2006;295:2366-73.
2. Singh H, Nugent Z, Demers AA, Kliewer EV, Mahmud SM, Bernstein CN. The reduction in colorectal cancer mortality after colonoscopy varies by site of the cancer. Gastroenterology 2010;139:1128-37.
3. Baxter N, Rabeneck L. New findings about the risks and limitations of colonoscopy used in the early detection of colorectal cancer. Healthc Q 2009;12:24-5.
4. Baxter NN, Sutradhar R, Forbes SS, Paszat LF, Saskin R, Rabeneck L. Analysis of administrative data finds endoscopist quality measures associated with postcolonoscopy colorectal cancer. Gastroenterology 2011;140:65-72.
5. Singh H, Demers AA. Quality indicators for colonoscopy and the risk of interval cancer. N Engl J Med 2010;363:1371-2; author reply 3.
6. Kaminski MF, Regula J, Kraszewska E, et al. Quality indicators for colonoscopy and the risk of interval cancer. N Engl J Med 2010;362:1795-803.
7. Gellad ZF, Weiss DG, Ahnen DJ, Lieberman DA, Jackson GL, Provenzale D. Colonoscopy withdrawal time and risk of neoplasia at 5 years: results from VA Cooperative Studies Program 380. Am J Gastroenterol 2010;105:1746-52.
8. Overholt BF, Brooks-Belli L, Grace M, et al. Withdrawal times and associated factors in colonoscopy: a quality assurance multicenter assessment. J Clin Gastroenterol 2010;44:e80-6.
9. Rabeneck L, Paszat LF, Hilsden RJ, et al. Bleeding and perforation after outpatient colonoscopy and their risk factors in usual clinical practice. Gastroenterology 2008;135:1899-906, 906 e1.
10. Larsen M, Hills N, Terdiman J. The impact of the quality of colon preparation on follow-up colonoscopy recommendations. Am J Gastroenterol 2011;106:2058-62.
11. Harewood GC, Sharma VK, de Garmo P. Impact of colonoscopy preparation quality on detection of suspected colonic neoplasia. Gastrointest Endosc 2003;58:76-9.
12. Rabeneck L, Rumble RB, Axler J, et al. Cancer Care Ontario Colonoscopy Standards: standards and evidentiary base. Can J Gastroenterol 2007;21 Suppl D:5D-24D.
13. Rex DK, Petrini JL, Baron TH, et al. Quality indicators for colonoscopy. Am J Gastroenterol 2006;101:873-85.
14. Rex DK, Bond JH, Winawer S, et al. Quality in the technical performance of colonoscopy and the continuous quality improvement process for colonoscopy: recommendations of the U.S. Multi-Society Task Force on Colorectal Cancer. Am J Gastroenterol 2002;97:1296-308.
15. Pickhardt PJ, Nugent PA, Mysliwiec PA, Choi JR, Schindler WR. Location of adenomas missed by optical colonoscopy. Annals of internal medicine 2004;141:352-9.
16. Williams JE, Le TD, Faigel DO. Polypectomy rate as a quality measure for colonoscopy. Gastrointest Endosc 2011;73:498-506.

17. Millan MS, Gross P, Manilich E, Church JM. Adenoma detection rate: the real indicator of quality in colonoscopy. Dis Colon Rectum 2008;51:1217-20.
18. Barclay RL, Vicari JJ, Doughty AS, Johanson JF, Greenlaw RL. Colonoscopic withdrawal times and adenoma detection during screening colonoscopy. N Engl J Med 2006;355:2533-41.
19. Barclay RL, Vicari JJ, Greenlaw RL. Effect of a time-dependent colonoscopic withdrawal protocol on adenoma detection during screening colonoscopy. Clinical gastroenterology and hepatology : the official clinical practice journal of the American Gastroenterological Association 2008;6:1091-8.
20. Simmons DT, Harewood GC, Baron TH, et al. Impact of endoscopist withdrawal speed on polyp yield: implications for optimal colonoscopy withdrawal time. Alimentary pharmacology & therapeutics 2006;24:965-71.
21. Taber A, Romagnuolo J. Effect of simply recording colonoscopy withdrawal time on polyp and adenoma detection rates. Gastrointest Endosc 2010;71:782-6.
22. Lee RH, Tang RS, Muthusamy VR, et al. Quality of colonoscopy withdrawal technique and variability in adenoma detection rates (with videos). Gastrointest Endosc 2011;74:128-34.
23. Klionsky DJ, Abdalla FC, Abeliovich H, et al. Guidelines for the use and interpretation of assays for monitoring autophagy. Autophagy 2012;8:445-544.