

# Alberta Family Physician Electronic Endoscopy (AFPEE) Study 2016 Report Card

**MASTER**





# Alberta Family Physician Electronic Endoscopy Study

September 2016

Dear Physicians,

Thank you and your endoscopy teams for participating in the Alberta Family Physician Electronic Endoscopy (AFPEE) study. Over a six-month period, nine Alberta Family Physician endoscopists and their teams collected data on 1769 colonoscopies performed in 11 rural Alberta sites. This is, to our knowledge, the largest multicenter study examining the quality of colonoscopies performed by Family Physicians.

Within this master report card are the combined results of all the participating physicians. The results should be self-explanatory, but definitions of outcomes and calculations are provided where necessary. Benchmarks were derived from existing literature and when benchmark targets differed between guidelines, the most commonly quoted or most stringent target was used. For example, for the quality of bowel preparations, American Society of Gastrointestinal Endoscopy recommends that inadequate bowel preparations should occur in  $\leq 15\%$  of procedures,<sup>1</sup> while the National Health Services Bowel Cancer Screening Program<sup>2</sup> and others<sup>3</sup> recommend  $\leq 10\%$ . Therefore in the study,  $\leq 10\%$  benchmark target was used.

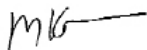
We encourage you to share this overall report with your local endoscopy team for reflection and review any potential areas you feel could improve or enhance your endoscopy program. We also encourage sharing this report with local and regional administrators to support your endoscopic program and your hospital's accreditation.

We have thus far presented the study results at Endoscopy Skills Days for Practicing Endoscopists, Alberta Scientific Assembly and the University of Alberta Department of Family Medicine Research Day. We also hope to present at an international gastrointestinal conference in 2017 and publish the AFPEE Study results in a high impact journal.

We believe in ongoing recording of quality outcomes of endoscopy and colonoscopy and will accept any feedback or ideas for using our data collection tool in REDCap™ in the future.

Once again, a huge thank you to you and your endoscopy team for your participation and contribution to the AFPEE Study. If you have questions about the results or are interested in being involved in studies stemming from AFPEE data or future endoscopy studies, please contact me.

Sincerely,



Mike Kolber BSc, MD, CCFP, MSc  
Principle Investigator, AFPEE study  
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mkolber@ualberta.ca

# Table of Contents

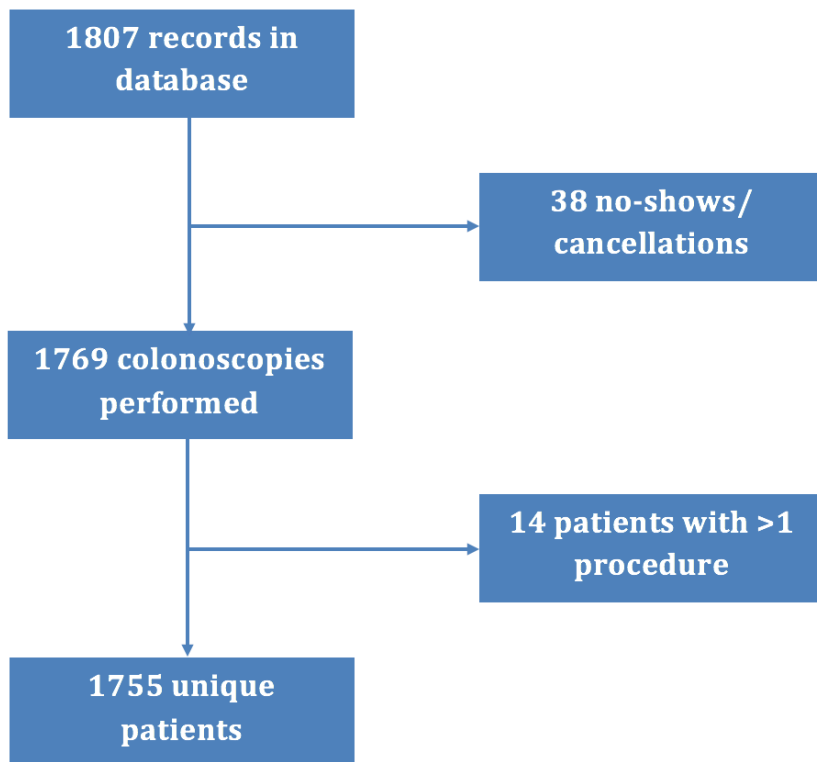
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<b>AFPEE Study Records: All Physicians</b> .....	<b>1</b>
<b>Summary of Results: All Physicians</b> .....	<b>2</b>
<b>Patient Demographics</b> .....	<b>3</b>
<b>Bowel Preparation</b> .....	<b>4</b>
<b>Procedural Sedation</b> .....	<b>5</b>
<b>Procedural Sedation</b> .....	<b>6</b>
<b>Patient Discomfort during Colonoscopy</b> .....	<b>7</b>
<b>Proportion of Successful Cecal Intubations</b> .....	<b>8</b>
<b>Adenoma Detection</b> .....	<b>9</b>
<b>Advanced Adenomas and Cancer Incidence</b> .....	<b>10</b>
<b>Procedural Times</b> .....	<b>11</b>
<b>Referral to Another Physician</b> .....	<b>12</b>
<b>Potential Adverse Events Related to Colonoscopy</b> .....	<b>13</b>
<b>References</b> .....	<b>14</b>
<b>Appendix 1: Data Procurement</b> .....	<b>15</b>
<b>Appendix 2: NAPCOMs Comfort Scale and Modified Gloucester Comfort Score</b> .....	<b>16</b>
<b>Acknowledgements</b> .....	<b>17</b>

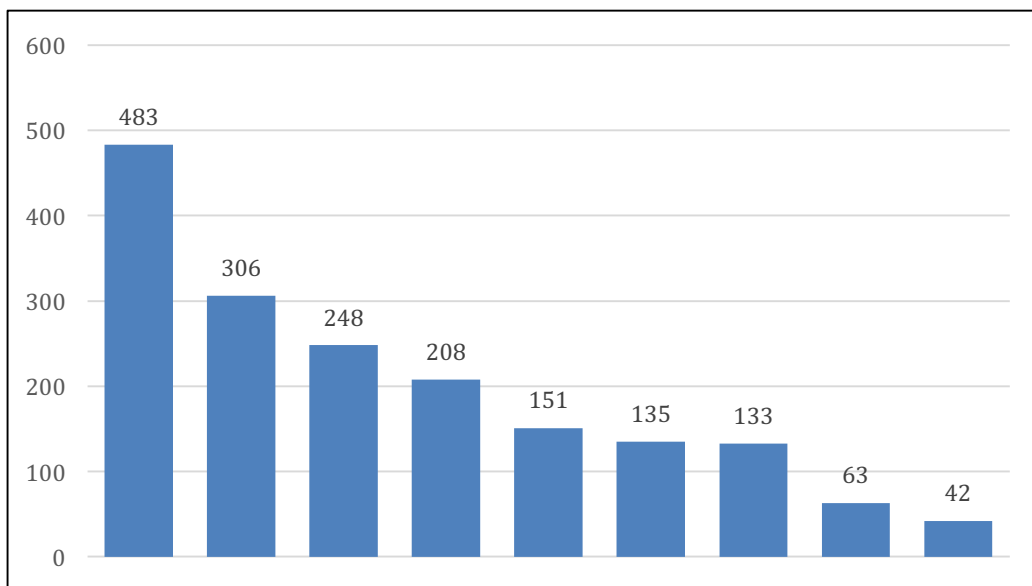




# AFPEE Study Records: All Physicians



## Procedures Performed, by Physician:



**Mean number of procedures per physician: 197 (range: 42 - 483)**

## Summary of Results: All Physicians

Outcome	Benchmark Target	Overall Study Results	Group Benchmark Obtained
Inadequate Bowel Preparations	< 10%	3.8%	✓
Patient comfort	Moderate or significant discomfort <10%	3.3%	✓
Proportion of Successful Cecal Intubations	≥ 90%	97.9%	✓
Withdrawal Time (when no lesions detected)	≥ 6minutes	9.4 mins	✓
Proportion of Males ≥50 years, 1 <sup>st</sup> time colonoscopy with adenoma or sessile serrated adenoma*	≥ 30%	67.4%	✓
Proportion of Females ≥50 years, 1 <sup>st</sup> time colonoscopy with adenoma or sessile serrated adenoma*	≥ 20%	51.1%	✓
Mean adenomas or sessile serrated adenomas* per 100 scopes	NA	120	NA
Bleeding**	< 1%	0.1%	✓
Perforation**	< 1/1000	None	✓
Procedural Sedation Adverse Event**	<1%	None	✓

\* = pathologically confirmed

\*\* see page 14 for definitions of bleeding, perforation and procedural sedation adverse events



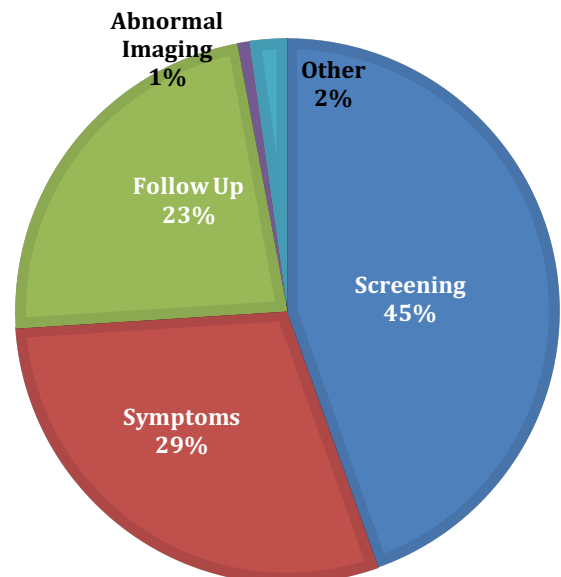
# Patient Demographics

Physician	Number of colonoscopies performed	Mean patient age (years)	Female (%)	First-time colon (%)	Indications		
					Screening (%)	Symptoms (%)	Follow Up Scope (%)
Individual Physicians	483	58.6	51.1	49.5	42.9	33.1	21.1
	306	60.9	50.2	49.5	57.8	23.5	16.0
	248	59.2	54.3	53.9	40.7	39.1	17.7
	208	57.8	45.2	40.4	33.7	27.9	38.0
	151	62.9	48.7	34.0	50.3	12.6	34.4
	133	56.1	46.6	31.3	34.6	26.3	32.3
	135	61.4	53.7	44.8	52.6	24.4	17.0
	63	55.5	57.1	73.0	33.3	57.1	7.9
	42	57.8	40.5	47.6	47.6	23.8	26.2
<b>Overall Means</b>	<b>196.6</b>	<b>59.2</b>	<b>50.3</b>	<b>46.8</b>	<b>44.6</b>	<b>29.5</b>	<b>23.1</b>

## Top 10 Indications:

Indication	Overall (%)
FIT / FOBT Positive	23.9
Follow Up Polyp	18.9
FHx of CRC	12.9
Rectal Bleed	10.3
Abdominal Pain	7.5
Average Risk Screen	7.5
Anemia	4.6
Diarrhea	4.4
Constipation	2.7
Follow Up Colorectal Cancer	2.7

## INDICATIONS (GENERAL)



# Bowel Preparation

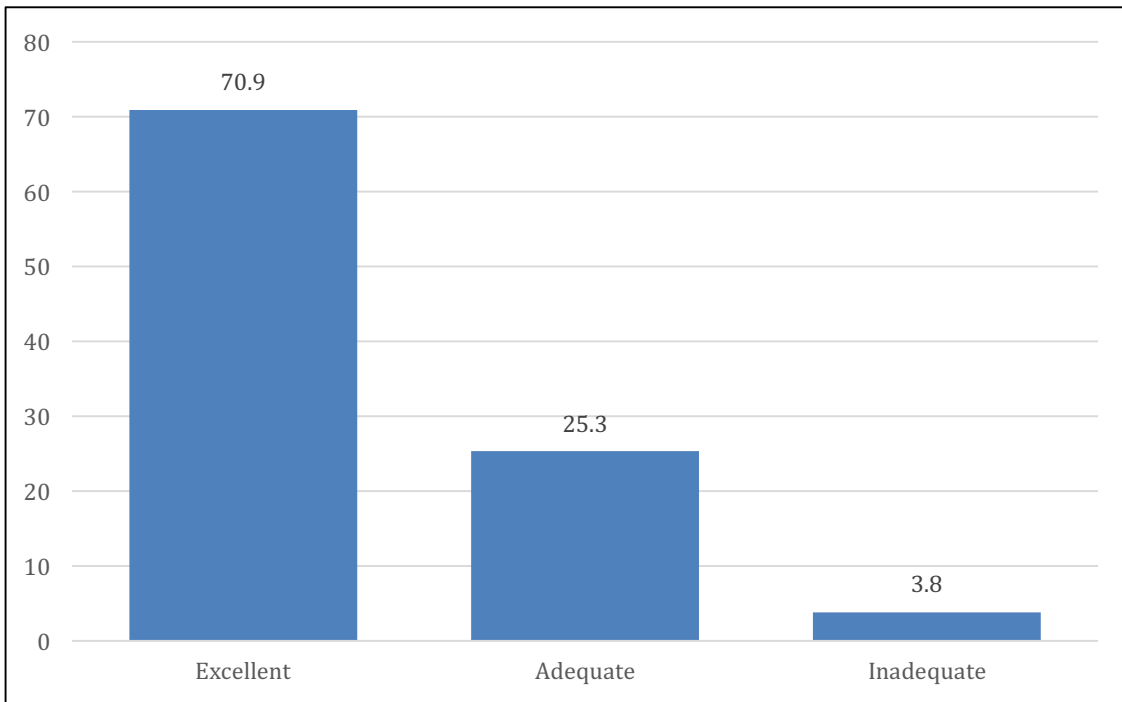
## Bowel Preparation Used:

Bowel Preparation Used	Overall (%)
Bi-PEG Lyte	52.7
Golytely	46.1
Picosalix	0.6
Other	0.6

**Split Preparation Used, Overall: 1730 (97.8%)**

*Note: Due to all overwhelmingly use of split preparation, we did not separate by physician*

## Bowel Preparation Results:



*Benchmark for proportion of inadequate bowel preparations is <10%*

**Group Benchmark Obtained: ✓**

**Bowel Preparation Definitions:**  
*Excellent: No or minimal solid stool and only clear fluid requiring suction*  
*Adequate: Collections of semi-solid debris that are cleared with washing or suction*  
*Inadequate: Solid or semi-solid debris that cannot be cleared effectively*  
**Benchmark Target:** At least 90% bowel preparation should be described as excellent or adequate.<sup>2,3</sup>  
 Therefore inadequate bowel preparations should be ≤10%.

## Procedural Sedation

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### Sedation Performed by:

**Overall:** Endoscopist 1185 (67.1%), Anesthetist 582 (32.9%)

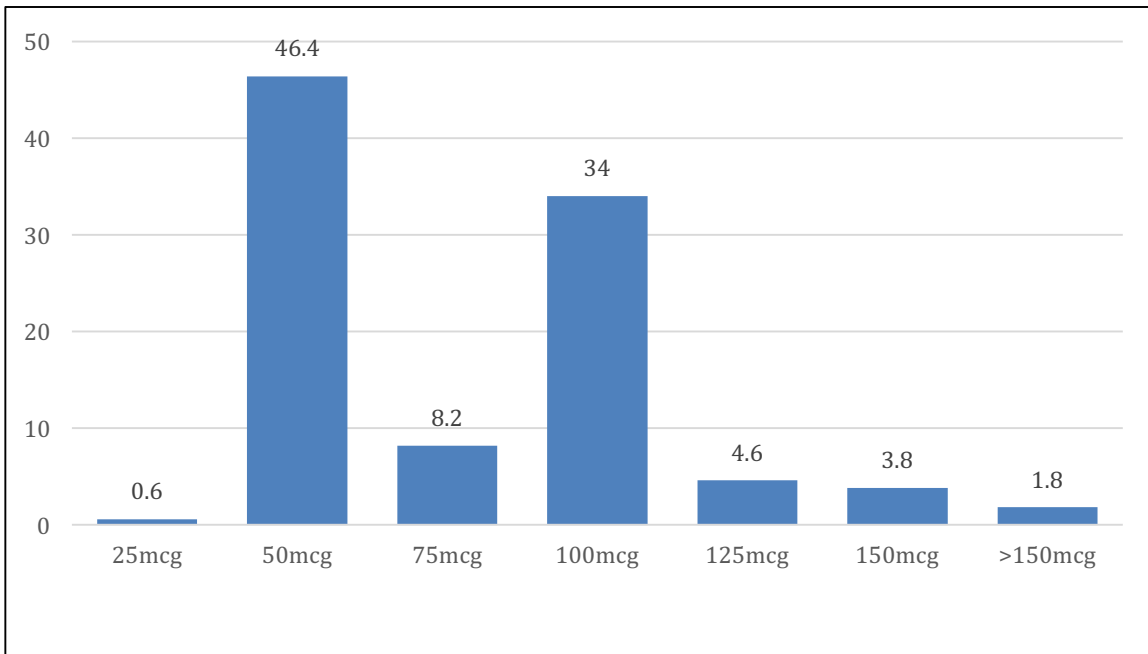
### Procedural Agents Used:

Agent	Overall
Versed (Midazolam)	1725 (97.5%)
Fentanyl	1545 (87.3%)
Propofol	817 (46.2%)
Remifentanyl	213 (12.0%)
Buscopan	293 (16.6%)
No sedation*	15 (0.8%)

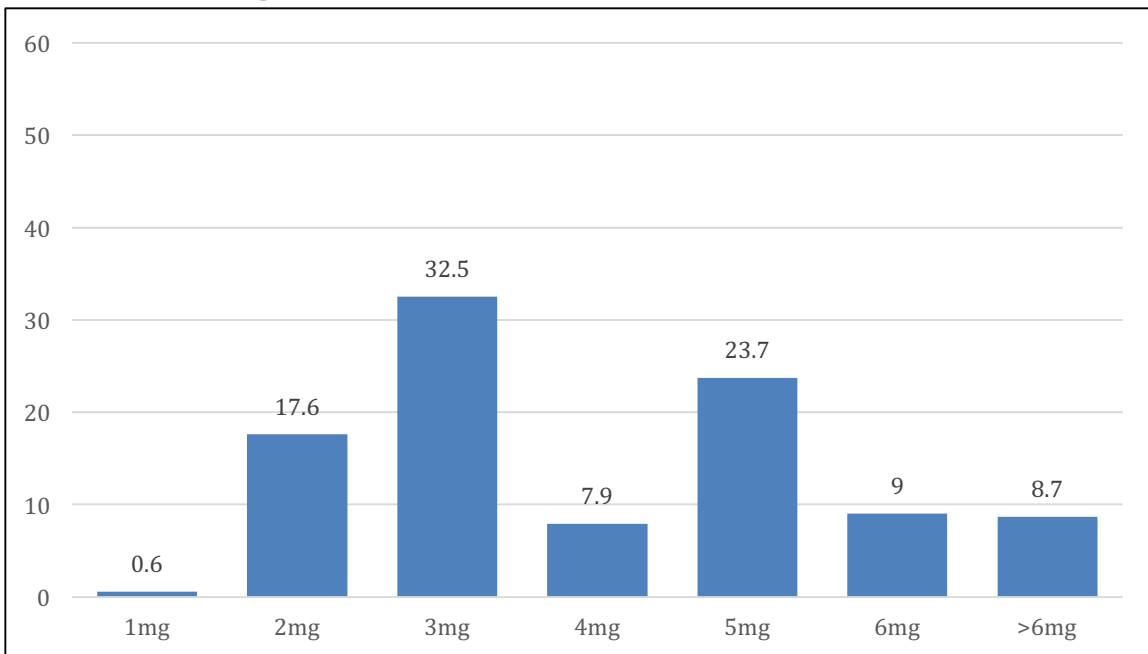
\* Includes cases in which only Buscopan was used

# Procedural Sedation

## Fentanyl Dosages Used:



## Versed Dosages Used:

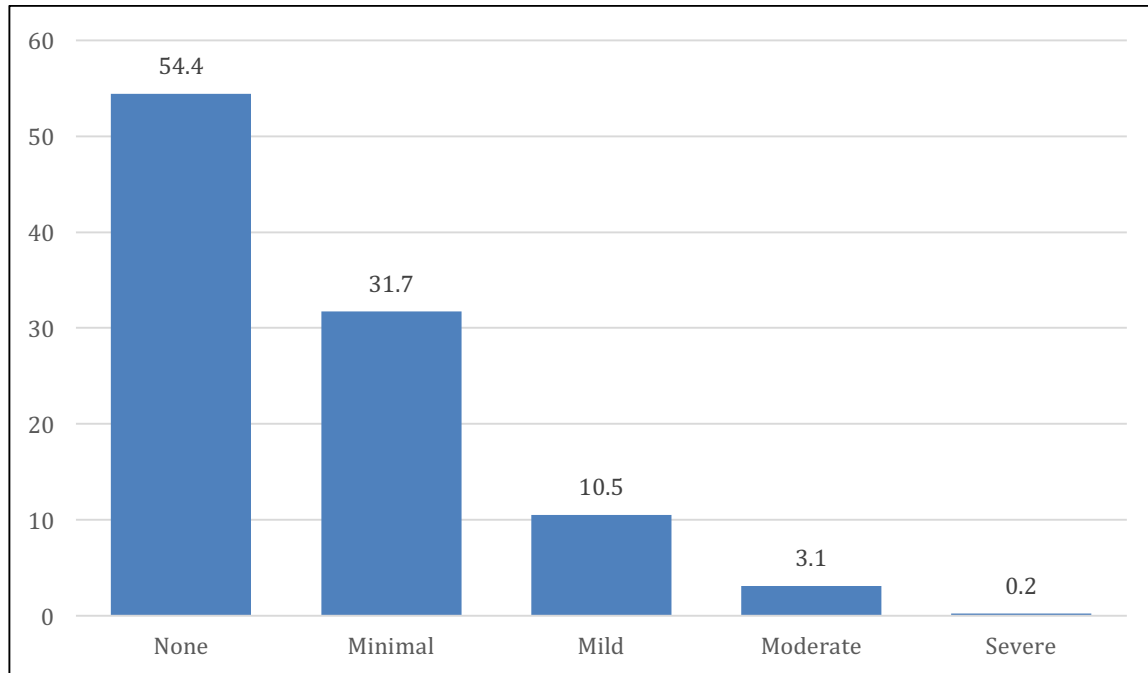


## Propofol Dosages Used:

**Overall:** median 80mcg, interquartile range: 50 – 100mcg

# Patient Discomfort during Colonoscopy

## Patient Discomfort



Benchmark for proportion of moderate or severe discomfort is <10%

**Overall:** Moderate plus Severe discomfort:  $55 + 4 = 59 / 1769 = 3.3\%$

**Group Benchmark Obtained: ✓**

### **Patient Discomfort Definitions:**

- NONE:** no discomfort - resting comfortably throughout procedure
- MINIMAL:** one or two episodes of mild discomfort, well tolerated
- MILD:** more than two episodes of discomfort, adequately tolerated
- MODERATE:** significant discomfort, experienced several times during procedure
- SEVERE:** extreme discomfort, experienced frequently during the procedure

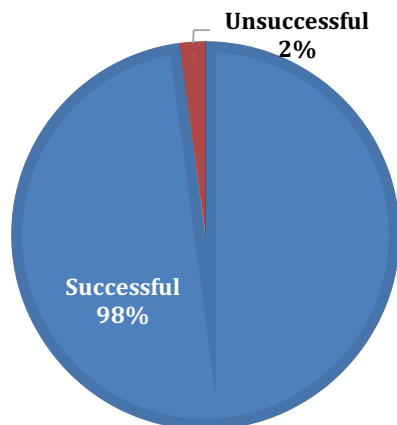
### **Benchmark Target:**

Alberta Colorectal Cancer Screening Program (ACRCSP) recommends <10% of patients have NAPCOMs score of  $\geq 6$ .<sup>4</sup> Moderate or severe discomfort on Gloucester scale is equivalent to NAPCOMs score of 6 (see appendix). Therefore study benchmark: <10% of patients experienced moderate or severe discomfort.

# Proportion of Successful Cecal Intubations

## Successful Cecal Intubations:

### CECAL INTUBATIONS



**Overall:** Proportion Successful Cecal Intubations:  
= 97.9% (95% CI: 97.2, 98.6)

**Group Benchmark Obtained:** ✓

**Definition:** Proportion of successful cecal intubations divided by number of colonoscopies attempted. Adjustment for incomplete colonoscopies was not made due to inadequate bowel preparation or intent was not to perform a complete colonoscopy.

**Benchmark Target:** Cecal intubation rates should be > 90% for all colonoscopies and >95% for colonoscopies performed for screening.<sup>1</sup> Given that colonoscopies in the study were performed for a variety of indications, a cecal intubation rate  $\geq 90\%$  was chosen for the benchmark target.

## Reasons for Incomplete Colonoscopies:

Reason	Overall
Technically difficult	12 (31.6%)
Inadequate bowel preparation	12 (31.6%)
Stricture	9 (23.7%)
Equipment failure	1 (2.6%)
Intent not to perform complete colonoscopy	2 (5.3%)

## Photo Taken of Cecal Landmarks:

**Benchmark Target:** all cecal intubations accompanied by still photography.<sup>1</sup>

**Overall:** Yes 1583 (91.5%), No 148 (8.5%)

**Group Benchmark Obtained:** ✗

# Adenoma Detection

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## Adenomas or sessile serrated adenomas / 100 colonoscopies:

**Definition:** All pathologically confirmed adenomas, adenomas with high-grade dysplasia or villous on pathology (including sessile serrated adenomas or sessile serrated adenomas with dysplasia) from all colonoscopies, irrespective of indication.

**Benchmark Target:** none exists

**Overall:** 2099 adenomas or sessile serrated adenomas in 1769 colonoscopies  
= 120 adenomas per 100 colonoscopies

## Adenomas / 100 colonoscopies:

**Definition:** All pathologically confirmed adenomas, adenomas with high-grade dysplasia or villous on pathology from all colonoscopies, irrespective of indication.

**Benchmark Target:** none exists

**Overall:** 1692 adenomas in 1769 colonoscopies  
= 96 adenomas per 100 colonoscopies

## Proportion of Patients with at Least One Adenoma

**Definition:** Proportion of patients who had at least one pathologically confirmed adenoma or sessile serrated adenoma. Calculated for males or females  $\geq 50$  years having first time colonoscopy for any indication as denominator.

**Benchmark Target:** Proportion with  $\geq 1$  adenoma at colonoscopy should be 30% for males and 20% for females.<sup>1</sup> ASGE recommends this benchmark be used for patients undergoing average risk screening colonoscopy.<sup>1</sup> Due to the fact that average risk screening colonoscopies are rarely performed in Canada, we chose first time colonoscopies performed for any reason in patients  $\geq 50$  years (separated by gender) to be analyzed. Alberta Colorectal Cancer Screening Program recommends including sessile serrated adenomas.<sup>4</sup>

**MALES, Overall:** 205 patients with at least one adenoma in 304 males ( $>50$  years, 1<sup>st</sup> time colonoscopy) = 67.4%

**FEMALES, Overall:** 156 patients with at least one adenoma in 305 females ( $>50$  years, 1<sup>st</sup> time colonoscopy) = 51.1%

**Group Benchmark Obtained: ✓**

# Advanced Adenomas and Cancer Incidence

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## Advanced adenomas / 100 colonoscopies:

**Definition:** All adenomas or sessile serrated adenomas that measured  $\geq 1$  cm in size at the time of endoscopy (by the open biopsy technique) or contain villous components or high-grade dysplasia on pathology.

**Benchmark Target:** none exists

**Overall:** 628 advanced adenomas (AA) in 1769 colonoscopies  
**= 36 AAs per 100 colonoscopies**

## Cancer Incidence:

**Definition:** Cancers found at endoscopy and pathologically confirmed divided by all colonoscopies performed.

**Overall:** 17 cancers in 1769 colonoscopies  
**= 1 cancer per 100 colonoscopies**



# Procedural Times

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## Total Procedure Time:

**Overall:** Mean procedure time: 26.3 minutes (SD 11.2, range 1-109)

**Definition:** Time from insertion of the colonoscope until it is removed from the anus.

## Withdrawal Times When no Lesions Detected:

**Overall:** Mean withdrawal time: 9.4 minutes (SD 3.8, range 2-45)

**Group Benchmark Obtained:** ✓

**Definition:** Withdrawal times (time from leaving the cecum until the colonoscope exits the anus) for completed colonoscopies (i.e. successful cecal intubation) when no polyps were detected.

**Benchmark Target:** Withdrawal phase of colonoscopy in patients without previous surgical resection, and in whom no biopsies or polypectomies are performed, should last  $\geq 6$  minutes on average.<sup>1</sup>

# Referral to Another Physician

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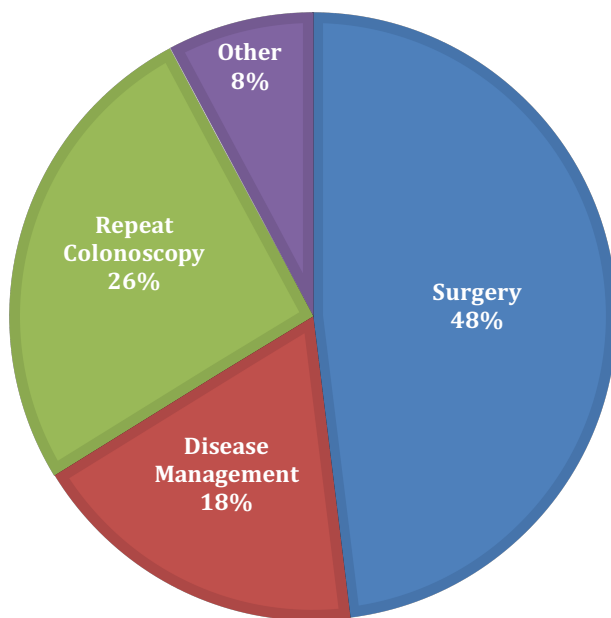
## Overall Referral Rate:

**Overall:** Referral rate:  $77/1769 = 4.4\%$

**Definition:** Proportion of patients referred to another physician for the gastrointestinal complaint for which the colonoscopy was performed. A referral was counted if at the time of colonoscopy the physician anticipated that a referral would be sent.

## Reasons for Referral:

### OVERALL



# Potential Adverse Events Related to Colonoscopy

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## Adverse Events:

**Overall:** Potential adverse events: 2 post polypectomy bleeds / 1769 = **0.1%**

**Group Benchmark Obtained: ✓**

**Adverse Event Definition:** an immediate complication that included:

- **Bleeding:** any bleeding related to the colonoscopy which subsequently resulted in a blood transfusion, admission to hospital, a second colonoscopy or surgery.
- **Perforation:** Both clinical AND radiographic evidence (free air on plain abdominal films or CT scan) of a perforation.
- **Related to procedural sedation and analgesia (PSA):** Premature stoppage of colonoscopy due to adverse events of PSA, use of reversal agents, had to artificially ventilate the patient or admit patient to hospital after the procedure for any cardiac or respiratory condition related to the PSA agents

**Other:** endoscopists had ability to text record any other potential adverse event.

**Benchmarks:** **Bleeding:** < 1%<sup>1</sup>, **Perforation:** < 1/1000,<sup>2</sup> **Related to Procedural Sedation:** < 1%<sup>4</sup>

## References

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6. Rostom A, Ross ED, Dubé C, Rutter MD, Lee T et al. Development and validation of a nurse-assessed patient comfort score for colonoscopy. *Gastrointestinal Endoscopy* 2013;77(2):255- 261.

# Appendix 1: Data Procurement

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Data in the AFPEE study was collected in real time (at the time of colonoscopy) using iPads™ or an existing computer within the endoscopy suite. Study data were collected and managed using REDCap™ electronic data capture tools hosted by the Women & Children's Health Research Institute at the University of Alberta.<sup>5</sup> Data entry was performed by both nurses and physicians, of which the proportions of reporting by each group varied by endoscopy units.

Typically, nurses would enter the patient information a few days prior to the endoscopy date. This would allow for sites to capture no show or cancellation rates. Then, details pertaining to patient demographics, indications, bowel preparations used and whether first time colonoscopy were entered prior to the procedure start. Procedural times, sedation agents and patient comfort, cecal landmarks (or reasons for incomplete colonoscopy) and information pertaining to polyps (including location, size, appearance and how removed) or other findings were typically entered in a collaborative fashion by the endoscopist and nursing team. The endoscopist would also render a 'most responsible diagnosis' at the end of the procedure and whether it was anticipated that the patient would be referred to another physician for the gastrointestinal problem for which the colonoscopy was performed.

Participating physicians would then reconcile pathology corresponding to lesions removed from their own electronic medical record.

Using the REDCap™ system allowed for individual colonoscopists to review their statistics in real time.

Once data was entered the study team identified and removed duplicate entries, highlighted missing data or outliers. Free text comments were reviewed and clarified by the participating endoscopists as necessary. Finally, random audits of 10% of the pathology findings were performed by all participating physicians.

For any potential AE recorded, the physician endoscopist was asked to provide as much narrative detail pertaining to the procedure and subsequent events (without providing identifiers). Anonymized information was then provided to two academic family physicians who were not directly involved in the study for adjudication. Any records for which the adjudicators did not agree on whether an adverse event occurred were sent to a senior gastroenterologist for a final decision. There was no disagreement between initial adjudicators.

Statistical analysis was performed primarily using IBM SPSS™ Version 22 and Microsoft Excel™.

Nicole Olivier, Research Coordinator AFPEE study

Mike Kolber, Principal Investigator AFPEE study

## Appendix 2: NAPCOMs Comfort Scale and Modified Gloucester Comfort Score

### Nurse Assessed Patient Comfort Score (NAPCOMS)

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 duration (episode <30 sec)	Moderate duration (30 sec – 1 min)	Long duration (episode lasts >1 min)	
	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	

\*Level of consciousness and Tolerability are not used in overall score

### Modified Gloucester Comfort Score<sup>2</sup>

- NONE: no discomfort - resting comfortably throughout procedure  
 MINIMAL: one or two episodes of mild discomfort, well tolerated  
 MILD: more than two episodes of discomfort, adequately tolerated  
 MODERATE: significant discomfort, experienced several times during procedure  
 SEVERE: extreme discomfort, experienced frequently during the procedure

# Acknowledgements

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We would like to sincerely thank all the participating physicians and their endoscopy teams for their interest, voluntary participation and efforts in data collection for the study.

We specifically wish to thank the following AFPEE team members for their contributions to the study:

- Ryan Torrie (Study Associate)
- Matt Taylor (Computer Programmer)
- Caitlin Finley (Report Card Work)
- Oksana Babenko (Statistical Analysis)

We would also like to thank the Alberta Rural Physician Action Plan (RPAP) as well Northern Alberta Family Medicine Fund (NAAFMF), University of Alberta, Department of Family Medicine for funding the study.

Finally, we are indebted to Dr. Lee Green, AIHS Translational Health Chair and EnACT for their in-kind support of the AFPEE Study.

