

Improved patient care and cost savings after rapid access to endoscopy initiated at a community hospital

The use of a detailed referral form and direct-to-procedure appointments at Vernon Jubilee Hospital endoscopy suite have reduced nursing overtime hours and permitted the early diagnosis of gastrointestinal cancers without any increase in procedural complications.

ABSTRACT

Background: In January 2016, an elective endoscopy clinic that had been operating at Vernon Jubilee Hospital on Monday afternoons (or Tuesday after a statutory holiday) was replaced by a Rapid Access Clinic for Endoscopy (RACE) to improve access to endoscopy for patients with urgent indications. The aim was to optimize use of existing resources and reduce wait times for specialist consultation and GI endoscopy for patients with cancer or other pathology. A new protocol was implemented with a detailed referral form and dedicated endoscopy time to allow direct-to-procedure appointments at the next available date.

Methods: A retrospective chart review was used to compare the first 6 months postimplementation of RACE in 2016 with the same 6 months in 2015 pre-RACE. Patient cohorts were matched for urgent indications.

Results: The mean referral-to-scope time for patients referred to RACE was 12.1 days compared with a wait time for pre-RACE patients of 97.7 days ($P < .05$). Significantly more cancers were diagnosed after RACE was implemented: 12 cases (11.8%) in 2016 versus 2 cases (2.6%) in 2015 ($P < .05$). In addition, RACE reduced nursing overtime hours: 15.75 hours versus 28.59 hours with a cost of \$4256.77 versus \$13849.11. Patient complications were similar for RACE and pre-RACE patients.

Conclusions: RACE improved access to endoscopy for patients with urgent indications, diagnosed cancers successfully, and reduced nursing overtime hours and costs without increasing procedural complications.

Background

Colorectal cancer is the third most prevalent cancer in Canada, as well as the second leading cause of mortality from cancer in men and the third leading cause of mortality from cancer in women.¹ Esophageal and gastric cancers are less prevalent, but have among the lowest of the relative 5-year survival rates at 14% and 25% respectively.¹

Targets for endoscopy

Patient satisfaction is an important component of health care, particularly when an invasive procedure is required to rule out a cancer diagnosis. In 2006, the Canadian Association of Gastroenterology (CAG) responded to reports of excessive

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wait times for digestive disease specialist appointments and endoscopy by producing 24 consensus statements on acceptable wait times for a consultation and procedure.² According to these statements, patients with acute gastrointestinal bleeding should be assessed within 24 hours, and patients with a high likelihood of cancer based on imaging or physical examination, or with severe and progressive dysphagia or odynophagia, should be assessed endoscopically within 2 weeks. Indications for an assessment target of 2 months include bright red rectal bleeding, iron deficiency anemia, a positive fecal occult blood test, chronic viral hepatitis, stable dysphagia, poorly controlled reflux/dyspepsia, chronic constipation or diarrhea, change in bowel habits, and chronic unexplained abdominal pain. A target of 2 months also applies to confirmation of celiac disease. However, growing wait lists for surgeon or gastroenterologist consultations and limited endoscopy time have made reaching these targets challenging.

A study by Royle and colleagues³ showed that a same-day consultation with a flexible sigmoidoscopy for urgent referrals (within 2 weeks) detected more cancers with shorter wait times and resulted in fewer visits to the emergency department. A same-day consultation, procedure, and diagnosis also reduced patient anxiety. Hitchins and colleagues showed that overall patients were satisfied with the timing of a straight-to-test system, and that communication and follow-up after the procedure improved patient experience.⁴

Rapid Access Clinic for Endoscopy

In January 2016, the Rapid Access Clinic for Endoscopy (RACE) replaced the clinic operating previously at Vernon Jubilee Hospital on Mon-

day afternoons (or Tuesday after a statutory holiday). This was done to reduce the wait time for endoscopy in keeping with the CAG targets and to identify serious pathology for inpatients and outpatients with urgent indications. In addition, it was hoped that having dedicated time allotments for inpatient emergency add-on cases following a weekend would minimize nursing overtime hours.

Scheduling for endoscopy was reformatted to include five dedicated slots for outpatients needing rapid access endoscopy and two slots for inpatient emergency add-on cases. Previously, all seven slots were booked electively for outpatients and emergency cases were added on as required.

A referral form for RACE was developed (Figure) using indication criteria and medical history details from a variety of hospitals that already provide rapid access to endoscopy services.⁵⁻⁷ The instructions on the form require the referring physician to mark the appropriate indication for referral and to provide any medical information that might exclude the patient from having a RACE appointment. The referring physician is expected to phone the general surgeon on call to discuss the case. Once this is done, the completed form is faxed to the surgeon's office and the patient is booked for the next available RACE appointment. The surgeon's office then contacts the patient regarding the appointment and provides information on preparing for gastroscopy, colonoscopy, or both. In a departure from pre-RACE practice, the patient does not necessarily undergo endoscopy with the surgeon who was on call at the time of referral. When the date for the appointment arrives, the surgeon assigned to the Rapid Access Clinic for Endoscopy for that day consults with the patient, performs the procedure in the same

visit, and assumes care of the patient for follow-up purposes.

Methods

After approval was granted by the Interior Health Research Ethics Board for a retrospective chart review, records were accessed for endoscopies performed before implementation of RACE (2015) and after (2016). Both the RACE and pre-RACE cohorts consisted of outpatients, inpatients, and patients referred directly from the emergency department and family physicians in the community.

RACE may allow for cancer diagnosis at an earlier stage, leading to better outcomes for the patient.

Charts for 210 patients who attended the Monday afternoon endoscopy clinic in 2015 were reviewed. Charts for 102 patients referred for indications that would not have qualified for RACE were excluded from the review. These non-urgent cases included patients undergoing follow-up procedures for previous pathology findings, patients referred only for having a positive family history of gastrointestinal disease, and patients with gastroesophageal reflux disease (GERD) without dysphagia, chronic constipation, diverticular disease, or chronic abdominal pain. Patients were also excluded if the procedure could not be completed. This left a total of 108 charts for patients undergoing gastroscopy, colonoscopy, or both in 2015 to be analyzed.


 Interior Health RAPID ACCESS CLINIC FOR ENDOSCOPY Referral Form		
<input type="checkbox"/> Dr. S Ainslie <input type="checkbox"/> Dr. A Taves <input type="checkbox"/> Dr. K Langer <input type="checkbox"/> Dr. H Hwang <input type="checkbox"/> Dr. J Demetrick <input type="checkbox"/> Dr. K Wiseman		
ON CALL SURGEON MUST BE CALLED FOR ALL REFERRALS 250-545-2211		Please fax completed form to <input type="checkbox"/> 250-545-8212 General Surgery Clinic <input type="checkbox"/> 250-545-2781 Dr. H Hwang
REFERRING PHYSICIAN INFORMATION		
Name		Physician MSP Number
		Phone
		Fax
PATIENT INFORMATION		
Last Name, First Name		PHN
		Day Time Phone
		Date of Birth
INDICATION FOR GASTROSCOPY		INDICATION FOR COLONOSCOPY
<input type="checkbox"/> Dysphagia or odynophagia	Any age	<input type="checkbox"/> FIT+
<input type="checkbox"/> GI bleeding	Any age	Age < 50 or 75-85
<input type="checkbox"/> Recurrent vomiting	Any age	<input type="checkbox"/> Positive barium enema or CT colonography
<input type="checkbox"/> History of Barrett's with change in symptoms	Any age	Age 75-85
<input type="checkbox"/> Abdominal mass	Any age	<input type="checkbox"/> Loose stool and rectal bleeding
<input type="checkbox"/> Other	Any age	Age 40+
		<input type="checkbox"/> Loose stool without rectal bleeding > 6 wk
		Age 60+
		<input type="checkbox"/> Persistent rectal bleeding > 6 wk
		Age 60+
		<input type="checkbox"/> Palpable rectal mass
		Any age
		INDICATION FOR GASTROSCOPY AND/OR COLONOSCOPY
		<input type="checkbox"/> Chronic GI bleeding
		Any age
		<input type="checkbox"/> Iron def anemia with Hb < 110
		Any age
		<input type="checkbox"/> Unintentional weight loss
		Any age
		<input type="checkbox"/> Suspicious imaging study
		Any age
		<input type="checkbox"/> Other
MEDICAL INFORMATION		
Exclusions for RACE clinic (please call on call surgeon to discuss case): <input type="checkbox"/> Age under 16 <input type="checkbox"/> Anticoagulated (medication): _____ <input type="checkbox"/> On home oxygen <input type="checkbox"/> Unable to tolerate bowel prep <input type="checkbox"/> Severe frailty (could not withstand a general anesthetic) <input type="checkbox"/> Pacemaker or ICD <input type="checkbox"/> Diabetes on insulin <input type="checkbox"/> Valvular heart disease <input type="checkbox"/> Coronary stent placement within last 12 months <input type="checkbox"/> Severe cardio-respiratory disease <input type="checkbox"/> Hemodynamically unstable <input type="checkbox"/> Confirmed ARO (MRSA, VRE, ESBL, etc)		Medications: Please provide a full list or pharmanet Past medical history (list significant conditions) Allergies Previous surgeries
Please attach relevant lab work, imaging reports and previous endoscopy reports if available		
NB: The objective of the RACE clinic is to expedite endoscopy with direct-to-procedure booking with the first available endoscopist. The attending endoscopist will assume care of the patient for the purposes of follow-up regardless who was originally contacted. If the patient is not deemed appropriate for the RACE clinic, they will be booked for an office appointment		
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Figure. RACE referral form.

Charts for 160 patients who attended the Monday afternoon Rapid Access Clinic for Endoscopy in 2016 were reviewed. Charts for eight patients were excluded because the procedure was not completed. This left a total of 152 charts for patients undergoing gastroscopy, colonoscopy, or both in 2016 to be analyzed.

The referral time for outpatients was calculated from when the patient was first referred for consideration of endoscopy by the community physician. The referral time for inpatients was calculated from when the surgeon or gastroenterologist assessed the patient in hospital to when endoscopy was carried out. In addition to referral times, we compared the clinical diagnosis, pathologic diagnosis, and outcomes for patients in each group. We also considered nursing overtime hours and inpatient hospital length of stay in each group to evaluate the cost-effectiveness of RACE.

An online statistics calculator⁸ was used for the data analysis. Categorical comparisons were conducted using the chi-square and Fisher exact tests, and continuous variables were compared using the 2-tailed student *t* test. A *P* value of .05 was considered significant.

Results

While the proportion of males and females in the pre-RACE (2015) and RACE (2016) cohorts were similar, RACE patients were significantly older (Table 1). Comparing outpatients in the two groups showed the difference in mean wait time from referral to endoscopy for urgent or semiurgent indications was significant: 97.7 (SD 93.0) days in 2015 compared with 12.1 (SD 8.1) days in 2016 (*P* < .00001) (Table 2). Comparing inpatients in the two groups showed there was no significant difference in time from referral to endoscopy, the total length of

stay in hospital, or the postprocedure length of stay in hospital (Table 3).

Although the number of patients accessing endoscopy each week decreased from a mean of 8.12 to 6.87 between 2015 and 2016 (*P* < .05), the number of add-on emergency cases was similar: 1.46 in 2015 and 2.17 in 2016.

Six significant categories of pathology were identified in the review of patient charts (Table 4). Findings were categorized as normal when no significant pathology was identified grossly or microscopically. The benign/minor pathology category included patients with diagnoses of diverticular disease, hemorrhoids,

Table 1. Age and gender of patients in pre-RACE (2015) and RACE (2016) cohorts.

	Number of patients	Age in years mean (SD)	Male %	Female %
2015	108	59 (SD 18.0)	51	49
2016	152	63 (SD 17.8)*	62	38

**P* < .05

Table 2. Time from referral to endoscopy for outpatients in pre-RACE (2015) and RACE (2016) cohorts.

	Number of patients	Time from referral to endoscopy in days mean (SD)
2015	77	97.7 (93.0)
2016	102	12.1 (8.1)*

**P* < .05

Table 3. Time from referral to endoscopy and hospital length of stay for inpatients in pre-RACE (2015) and RACE (2016) cohorts.

	Number of patients	Time from referral to endoscopy in days mean (SD)	Total length of stay in hospital in days mean (SD)	Postprocedure length of stay in hospital in days mean (SD)
2015	31	1.55 (1.48)	7.72 (15.10)	4.72 (14.00)
2016	50	2.02 (1.82)	10.04 (22.90)	4.22 (6.23)

Table 4. Findings for outpatients and inpatients undergoing endoscopy in pre-RACE (2015) and RACE (2016) cohorts.

	Number of patients	Normal findings	Benign/minor pathology	Adenoma	Acute bleed	Inflammatory bowel disease	Cancer
Outpatients							
2015	77	19	38	16	0	2	2
2016	102	18	46	20	0	6	12*
Inpatients							
2015	31	0	21	1	3	2	1
2016	50	9	30	4	2	1	4

**P* < .05

hyperplastic polyp, gastritis, fundic gland polyp, hiatal hernia, radiation proctitis, melanosis coli, eosinophilic esophagitis, celiac disease, acute colitis (infectious or ischemic), stricture, or Schatzki ring. The adenoma category included patients with tubular and sessile serrated polyps as well as high-grade dysplasia. The acute bleed category included patients with lesions requiring intervention (clipping, injection, argon therapy) or showing signs of recent or active bleeding. The inflammatory bowel disease (IBD) category included patients diagnosed with Crohn disease or ulcerative colitis as determined by gross description and pathology. Finally, the cancer category included patients with all types of cancers diagnosed on endoscopic or microscopic findings from the procedure. In our study this included esophageal cancer, colorectal adenocarcinoma, and B-cell lymphoma. Significantly more cancers were identified in 2016 than in 2015. The significant difference was lost, however, if adenoma with high-grade dysplasia was included in the cancer category ($P = .06$).

Complications included bleeding after the procedure (as measured by blood transfusion required postprocedure), readmission to hospital within 30 days, mortality within 30 days, and procedure-related complications. In our study, procedural complications included an interstitial intravenous line during the procedure that required additional IV access, and bleeding following a polypectomy

that required clipping or injection. There were no significant differences found between the two groups in terms of these outcomes (Table 5).

Total overtime hours for endoscopy nurses amounted to 28.59 in 2015 and 15.75 in 2016, a 45% reduction in overtime. The total cost of these hours was \$13 849.11 in 2015 and \$4256.77 in 2016, a 69% reduction in overtime cost.

Conclusions

There was a significant difference in the age of patients in the study, with RACE patients having a mean age of 63 (SD 17.8) years compared with pre-RACE patients having a mean age of 59 (SD 18.0) years. This can be explained by the fact that a fecal immunochemical test for patients age 75 to 85 is one of the explicit inclusion criteria for RACE, a requirement designed to capture patients at risk of colorectal cancer who no longer qualify for the provincial screening program because of age.

A substantial difference in wait time from referral to endoscopy for outpatients was found when comparing the pre-RACE (2015) and RACE (2016) cohorts. The mean wait time of 97.7 days for outpatients referred for urgent or semiurgent indications in 2015 grossly exceeded the CAG guidelines. The mean wait time of 12.1 days for the same indications in 2016 after implementing RACE was a marked improvement made possible, in part, by patients not having to wait to be assessed in the general surgery

or gastroenterology office ahead of time. Patients were triaged by the on-call surgeon once the referral form was sent and booked immediately for endoscopy if appropriate.

Despite the smaller number of patients assessed by endoscopy in 2016, significantly more cancers were identified in 2016 than in 2015: 12 cancers (11.8%) versus 2 cancers (2.6%). This suggests that the referral and triage system is effective and that RACE may allow for cancer diagnosis at an earlier stage, leading to better outcomes for the patient. There was no significant difference between the two outpatient groups regarding other diagnoses. There was also no significant difference between the two groups in terms of complications, including bleeding and mortality. Although outcomes from our study suggest that patients were all screened appropriately, straight-to-endoscopy referrals can mean accepting patients at higher risk of procedural complications.

There was one death within 30 days of endoscopy in the RACE group; however, this was unrelated to the procedure or the findings of the procedure (gastric erosions found on gastroscopy and diverticulosis found on colonoscopy). The 84-year-old female died of cardiac arrest during a subsequent hospital admission.

Cost savings were derived mostly from a reduction in nursing overtime hours achieved by changing the number of scheduled endoscopy outpatient slots from seven in 2015 to five in 2016. This was done to accommodate a predictable average of 2.17 patients left over from the weekend, when there is no access to the endoscopy suite at Vernon Jubilee Hospital. Always having two slots available on Monday afternoons allowed urgent inpatient endoscopy to take place, while limiting the need for nursing overtime hours. It is im-

Table 5. Complications for all endoscopy patients in pre-RACE (2015) and RACE (2016) cohorts.

	Readmission %	Bleeding %	Mortality %	Procedural complications %
2015	11.0	3.7	0.0	1.3
2016	8.6	7.2	0.7	1.3

portant to note that this reduction in overtime was not achieved at the cost of patient outcomes. In fact, this study has shown an improvement in patient access with a significant increase in the detection of cancer with RACE.

Study limitations

Limitations of the study include patient cohorts not well matched for age, a short study period, and small sample size. In light of this, further evaluation of RACE could benefit from a longer study period to allow for a larger sample size.

A major limitation of the study is our comparison of patients from 2015 referred for endoscopy through a traditional non-urgent pathway with patients from 2016 referred for endoscopy with urgent indications. Although all of the patients included in the study had appropriate (i.e., urgent) indications, our study may overestimate the significance of the wait times as well as the pathology found. Additionally, we did not have the resources to study the outcomes of patients who did not have urgent indications after RACE was implemented.

Summary

Our findings suggest that the Rapid Access Clinic for Endoscopy has been a beneficial addition to the endoscopy service at Vernon Jubilee Hospital. RACE has allowed faster access to endoscopy for patients with urgent indications and permitted early diagnosis of many gastrointestinal cancers. RACE has accomplished this without any increase in procedural complications. As well, scheduling changes made with the implementation of RACE in 2016 have reduced nursing overtime costs.

Competing interests

None declared.

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