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Large Bowel Endoscopy in Ontario: Variation by Geographic Region and Hospital Type

Despite declines in mortality and incidence rates from the mid-1980s to the late 1990s, colorectal cancer (CRC) continues to be the leading cause of cancer death in non-smokers in Ontario (National Cancer Institute of Canada 2003). Fortunately, CRC's long, identifiable pre-malignant phase makes it preventable and an ideal candidate for a screening program.

It has been recommended that all asymptomatic, average-risk adults be screened beginning at age 50 years (Canadian Task Force on Preventive Health Care 2001). Screening modalities include annual or biennial fecal occult blood testing (FOBT); FOBT with flexible sigmoidoscopy; flexible sigmoidoscopy alone every five years; and colonoscopy every 10 years. In the recently published ICES Research Atlas, Large Bowel Procedures in Ontario, utilization of the above procedures in Ontario was examined for the screen-eligible population aged 50–74 (Vinden et al. 2004). Although data limitations make it impossible to distinguish between screening versus diagnostic or treatment procedures, the results have important implications for any future population-based screening program.

This article highlights findings from the research atlas with respect to colonoscopy and flexible sigmoidoscopy among the screen-eligible (age 50–74) Ontario population. Both procedures, which at the present time are performed primarily in hospital settings, will play an important role in any future organized screening program.

Methods

Utilization of large bowel endoscopy in Ontario was examined in several ways. Temporal trends were examined for Ontario, as a whole, from 1992 to 2001, and by county, for 2001 only. To explore further the rate variation across the province, hospitals were grouped into four categories: Small (<2,500 Total Weighted Cases, or TWC), Medium (2,500–10,000 TWC), Large (>10,000 TWC) and Teaching, after which the ratio of colonoscopy volume to total hospital volume was calculated for each group. Ontario Hospital Insurance Plan (OHIP) billing data were used for all rates. OHIP endoscopy billing codes are complicated; thus, all billings for endoscopy up to the splenic flexure (codes Z555 or Z555+E740) or using the 60 cm scope (fee code Z580) were considered flexible sigmoidoscopies. Endoscopy to the hepatic flexure or beyond (Z555+E740+E741, with or without E747 and E705) was classified as a colonoscopy.

For analysis by hospital type, the institution in which a colonoscopy was performed was identified by matching the OHIP record with the Canadian Institute for Health Information discharge abstract database (inpatient and same-day surgery). TWC volumes, tertiary-care volumes and hospital type for each institution were obtained from the Joint Policy and Planning Commission website at www.jppc.on.ca.

Table 1: Age- and Sex-Adjusted Endoscopy Utilization Rates[1] per 10,000 Ontarians 50–74 Years of Age, by Region and County, 2001

Region and County	Colonoscopy	Flexible Sigmoidoscopy
North	463.1	62.7
Cochrane	641.6	64.5
Greater Sudbury	562.9	72.9
Manitoulin	536.1	67.1
Sudbury	480.2	64.4
Parry Sound	454.3	91.0
Muskoka	447.8	94.5
Thunder Bay	413.8	70.5
Algoma	391.0	25.4
Timiskaming	389.0	37.2
Nipissing	347.5	55.1
Central East	439.2	74.0
Durham	501.9	69.7
Simcoe	455.4	66.9
Haliburton	430.1	69.8
York	428.0	74.0
Kawartha Lakes	396.9	95.3
Northumberland	395.1	68.6
Peterborough	323.6	92.9
Toronto	426.9	84.0
Toronto	426.9	84.0
Central West	373.0	80.6
Wellington	462.8	68.8
Halton	426.0	90.6
Waterloo	380.3	71.9
Peel	331.3	78.5
Dufferin	257.7	156.3
South West	366.4	78.9
Huron	588.8	82.5
Lambton	576.4	40.6
Bruce	493.9	65.9
Chatham-Kent	440.2	55.4
Perth	412.0	94.4
Grey	380.6	82.3
Essex	334.9	79.7
Elgin	278.0	102.2
Oxford	262.6	120.3
Middlesex	259.8	82.5
Central South	322.9	60.6
Brant	342.8	99.0
Niagara	326.1	51.6
Hamilton	319.7	57.6
Haldimand-Norfolk	303.1	70.6
East	286.8	89.8
Stormont, Dundas and Glengarry	410.0	99.0
Hastings	367.3	102.7
Prince Edward	348.4	52.1
Prescott and Russell	340.6	58.4
Lanark	291.4	64.4
Leeds and Grenville	277.8	37.6
Ottawa	254.8	105.0
Renfrew	233.4	87.7
Lennox and Addington	208.4	45.9

Note: Frontenac County, Rainy River District and Kenora District were excluded from this analysis because the data for the period were incomplete.

[1]Rates standardized to the 1991 Canadian population.

Data sources: Ontario Health Insurance Plan; *Statistics Canada Population Estimates*

Figure 1: Colonoscopy and Flexible Sigmoidoscopy Utilization Rates per 10,000 Population Age 50–74 years, Ontario 1992–2001

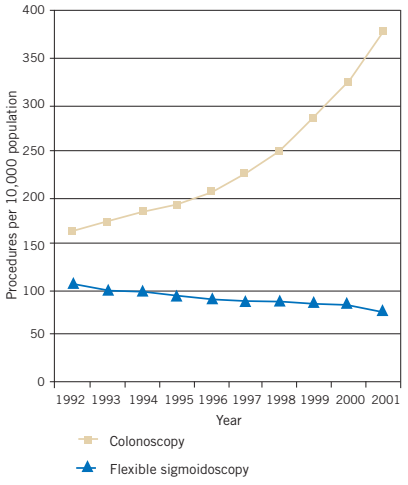
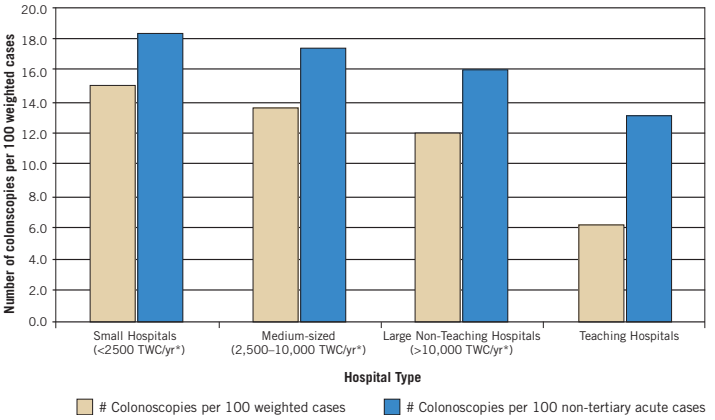


Figure 2: Ratio of Colonoscopy Volume to Total Hospital Volume* by Hospital Type in Ontario, 2001



*Hospital volume is measured in Total Weighted Cases (TWC). Each case is assigned a resource intensity weight (RIW) that estimates the hospital resources required, based on the severity and complexity of the condition and length of stay. The total of all RIWs is the total volume for that hospital.

Data sources: Ontario Health Insurance Plan; *Statistics Canada Population Estimates*; OHA-MOHLTC Joint Policy and Planning Committee.

Statistics Canada post-censal estimates were used for all population denominators. All rates were standardized to the 1991 Canadian population.

Results

Colonoscopy utilization in Ontario has grown significantly since 1992 (Figure 1), more than doubling from 162.3 procedures per 10,000 population to 378.0/10,000 in 2001. In contrast, flexible sigmoidoscopy rates declined slowly over the same period, from about 100 procedures per 10,000 to 76. Table 1 shows the wide variation in rates by county and region. The highest rates are found in the north, the lowest in the east.

Figure 2 shows a somewhat surprising result from analysis of colonoscopy rates by hospital type in 2001. As the TWC volume of a hospital increased, the colonoscopy : total volume ratio fell. Further, the 67 smallest hospitals in Ontario had a combined total weighted case volume in 2001 of 175,989, nearly identical to the volume of 176,634 weighted cases in the two largest teaching hospitals. However, 25,163 colonoscopies were performed in the small hospitals and only 9,050 in the two largest.

Discussion

Access to large bowel endoscopy is key to any CRC screening program as the initial test or, in the case of colonoscopy, as follow-up to positive screening tests. Several aspects of the results suggest cause for concern, or further investigation of access to large bowel endoscopy.

The first of these is the inverse relationship between colonoscopy : total volume ratio and hospital size. Does this mean that people living in communities served primarily by large or teaching hospitals have reduced access to colonoscopy? How do waiting times compare? This has serious implications because colonoscopy is required as follow-up to a positive initial screening test.

A second area of concern is the threefold difference in colonoscopy rates between areas with the highest and lowest rates. Again, does this reflect an access problem, or do physicians prefer other large bowel evaluation techniques in these areas?

Finally, declining rates of flexible sigmoidoscopy indicate underutilization of a procedure that has been endorsed as an initial screening test and can readily be performed in office settings. Several disincentives to performing flexible sigmoidoscopy have been discussed, most notably, the lack of an assigned Resource Intensity Weight, which excludes it from cost allocation or funding equations (Vinden et al. 2004). As well, the low technical or facility fee paid by OHIP for flexible sigmoidoscopy or colonoscopy performed outside hospitals is a barrier to access. All of these issues need to be addressed as Ontario prepares for a province-wide CRC screening program.

References

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