Mammography Rates for 20 Community-based Family Practices in Ontario

A Full Practice Audit

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ABSTRACT

Background: Many Canadian women 50 to 69 years of age do not have a mammogram within the recommended screening interval of every two years. Recent data suggest that over 50% of Canadian women did not have a time-appropriate mammogram and that not having a family physician was a significant factor associated with suboptimal screening. This study reviewed medical charts of 20 family physicians' practices to examine their mammography screening patterns.

Methods: Medical charts of all women between 52 and 71 years of age in 20 family practices were examined for mammography reports between September 2003 and June 2004.

Results: Across the 20 practices, 3,430 charts of eligible women 52 to 71 years of age were reviewed (mean per practice = 173 women; ranging from 38 to 385). The two-year time-appropriate mammography rate was 58.8%. The screening rates ranged from 25% to 76% across 20 practices. Four practices attained a 70% or greater time-appropriate screening rate. When we extended the time-appropriate frame to 36 months, the overall mammography rate increased to 70.0%. Practice size, method of remuneration for patient care, use of an electronic medical record, gender or age of physician, practice setting, use of Ontario Breast Screening Program (OBSP) were not found to be significantly associated with mammography screening rates.

Interpretation: Mammography rates within the recommended two-year interval for women who have a regular family physician are suboptimal. The rates for women in this study, all of whom have a family physician, were only slightly higher than those reported elsewhere for women without one. Further studies are required to uncover and overcome barriers to optimal mammography screening rates.

MeSH terms: Mammography; family practice; medical audit; questionnaires

La traduction du résumé se trouve à la fin de l'article.

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Breast cancer is the most commonly diagnosed cancer in women in Canada and is the second leading cause of cancer-related deaths.¹ The Canadian Task Force on Preventive Health Care assigned a Grade A recommendation for screening through clinical examination and mammography for women 50-69 every two years.² Seven randomized controlled trials, where one or both of these modalities were used, showed a survival benefit in this age group. In Ontario, most breast screening is done through family physicians' offices or through the Ontario Breast Screening Program (OBSP), a program set up to perform breast screening and to remind and encourage women to participate in an early cancer detection program. While most family physicians strongly endorse the importance of delivering preventive care, they frequently provide preventive care to their patients at lower levels than they themselves consider satisfactory.^{3,4}

A recent review by the Institute for Clinical Evaluation Sciences (ICES) of the OBSP data, data from Ontario Health Insurance Plan (OHIP) administrative databases and a self-reported population survey from the Canadian Community Health Survey (CCHS), showed that the mammography rate for Ontarian women of eligible age was 58.5%.⁵ The National Population Health Survey of 1996/97 reported 53.6% of Canadian women of eligible age had a mammogram within two years prior to the survey and that having a regular physician was a significant predictor of ever having had a mammogram.⁶ The OBSP's goal is to have 70% of the 1.3 million Ontario women undergo breast screening every two years.

How closely mammography screening rates of patients attending family practices approach this goal, the inter-practice rates variation as well as their correlates are unknown. As part of a quality assurance project, an audit of mammography utilization for all eligible women within a practice was carried out in 20 family physicians' practices in Southern Ontario. This paper reports the results of this chart review.

METHODS

Twenty family physicians were recruited to participate in a quality assurance project

assessing mammography screening. Of these, 17 had participated in a previous quality assurance project, and were part of a group of 26 community-based physicians who teach family practice residents at McMaster University in Hamilton, Ontario. Three additional non-representative physicians in the Hamilton region with no university affiliation were recruited, based on their interest in the topic, by one of the authors (JGS).

Each practice was asked to generate a list of eligible patients using the practice billing data and/or an electronic medical record and the following criteria: all women aged 52-71 at the time of audit who had visited the office at least once in the past three years. No distinction was made between women who had a mammography for reasons other than routine screening, such as investigation of symptoms or palpable lumps or previous mastectomy. The study's research assistant visited each practice and reviewed the charts of all eligible patients. A second auditor reviewed a random sample of charts from one practice to ensure the consistency in the data abstraction process. Inter-rater reliability was not calculated; disagreements were resolved by discussion. Data were entered directly into an electronic spreadsheet. Abstracted data included date of birth, date of the most recent mammography, and whether the patient had participated in the OBSP program. Participating physicians were asked to complete pre- and post-audit questionnaires that collected information about the physicians' demographics, their practices and the impact the audit had on the functioning of the office.

Data were analyzed using SPSS software for Macintosh (version 9.1). Descriptive statistics were calculated and t-tests were conducted to identify potential correlates of screening rates. All statistical tests were two-sided and a $p > 0.05$ was considered statistically significant. Ethics approval for the study was received from the Ethics Review Board at McMaster University.

RESULTS

The audit was conducted between September 2003 and June 2004. The aggregate biennial mammography rate was 58.8% (2,016/3,430). The number of eligible women per practice ranged from 38

TABLE I
Demographic Data

	Study Sample (n=20)	Janus Project 2001 (%)
Year of graduation	1965-1991 (Median 1980)	1981 (mean)
Practice size	900-3200 (mean 2000)	
Solo practice	8 (40%)	39.3
Receipt of preventive care performance bonus	5 (25%)	N/A
Have computer access and use	10 (50%)	N/A
Reminder systems for preventive care	5 (25%)	N/A
Gender female	5 (25%)	28.7
Practice location		
a) inner city	5 (25%)	7.1
b) suburban	11 (55%)	30.6
c) rural	4 (20%)	17.5
Rostered practices more than 50%	3 (15%)	N/A
Fee for service (FFS) more than 50%	11 (55%)	N/A

N/A= not available

Figure 1. Mammography rates by practice at the two-year interval

to 385 (mean=173 women). 1,103 (32.2%) of women had used the OBSP services for their mammogram screening. Non-OBSP screenings accounted for 26.2% (898/3,430) of eligible women, and 41.2% (1,414/3,430) women did not have information in their medical records that a mammogram test was performed within the past 2 years.

Table I displays demographic profiles of the participating physicians. Figure 1 shows mammography rates by practice at the two-year interval. Univariate analyses of the postulated correlates of mammography screening rates are shown in Table II. Having educational materials regarding mammography in the office, the only factor to reach a statistically significant relationship to mammography rates, correlated inversely with mammography rates.

Within practices, use of OBSP ranged from 1.0% to 76.5% of all eligible women.

Two physicians indicated that they did not use the OBSP at all, four used it sometimes and fourteen reported that they used the program regularly. There was no significant association between mammography screening rates and physician-reported OBSP use. Analysis of mammography rates using an expanded timeframe of 30 and 36 months showed an increase in the screening rate with most of the increase (7.9%) confined to 24-30 months time period (Table III).

The financial incentives offered by the Ministry of Health and Long-Term Care to capitated practices (Primary Care Networks and Family Health Networks and Health Service Organizations) for various rates of mammography are shown in Table IV. Based on our sample results, we indicated the projected number of physicians who would reach each target level.

TABLE II**Postulated Factors that Influence Mammography Rate (t-test)**

	Rate with Factor (%)	Rate without Factor (%)	P value
Year of graduation before 1980	57.9 (SD 14.1; n=10)	56.8 (SD 4.4; n=7)	0.851
Practice size <2000	56.8 (SD 13.5; n=10)	59.3 (SD 10.2; n=7)	0.687
Solo practice	57.7 (SD 16.2; n=8)	58.0 (SD 6.5; n=12)	0.944
Eligible for preventive care performance bonus	56.3 (SD 4.3; n=5)	58.9 (SD 12.9; n=14)	0.663
Uses computer for appointments	59.9 (SD 6.9; n=6)	54.8 (SD 17.9; n=13)	0.361
Uses EMR	58.7 (SD 7.3; n=10)	57.6 (SD 14.9; n=9)	0.841
Uses a reminder system	55.0 (SD 16.8; n=6)	59.9 (SD 8.1; n=13)	0.401
Uses educational materials to remind patients	48.0 (SD 14.9; n=4)	61.1 (SD 8.8; n=15)	0.035

TABLE III**Mammography Screening Rates at 24, 30 and 36 Months Prior to the Audit Date**

	% of Women	N of Women	Cumulative %
Within 24 months	58.9%	2007	58.9%
Within 30 months	7.8%	233	66.7%
Within 36 months	3.3%	46	70.0%

TABLE IV**Distribution of Financial Incentives for Practices with Rostered Patients Having Various Mammography Rates**

Mammography Rate	Number (%) of Practices	Incentive
0-54	7 (35.0)	0
55-59	5 (25.0)	\$220
60-64	4 (20.0)	\$440
65-69	0 (0.0)	\$770
70-74	2 (10.0)	\$1320
75+	2 (10.0)	\$2200

DISCUSSION

The overall mammography rate in this study was 58.8%. This corresponds closely to rates reported by Kasman for ICES⁵ and others,^{6,7} but was less than the 65% mammography rate that was hypothesized when designing this study. The National Population Health Survey of 1996/97 found a mammography rate of 53.6%.⁶ Maxwell's study was conducted 8 years earlier and covered all of Canada rather than only Southern Ontario, the focus of the current audit. Rates in this study where every woman had a family physician are not much different than Maxwell's where not having a family physician was thought to be a significant factor of lower screening rates.

Although these rates are less than ideal, consistency in rates over several different data sources and collection methods,⁵⁻⁷ suggests that there are common barriers to achieving higher rates. Obstacles to improved mammography screening have been documented from the perspective of patients.^{6,8-11} Van Harrison concluded that there were more patient population factors than personal physician factors contributing to mammography rates.⁷ In contrast,

Gann, in an earlier study, concluded that mammography rates were related to specific physician office characteristics.¹² Although both these studies were on populations that had mammography paid through an insurance plan, as is the case in the current study, the age of the population was different or the follow-up time frame was only one year.

The time interval between mammograms is one factor that influences rates. Screening mammography is only funded by the health care system every two years. The interval between examining a patient, arranging a mammogram and receiving a report could delay the timing by six months to a year. This is supported by the increased rates found at extended time intervals. Thirty to 36 months timeframe appears to be more realistic to reach the goals recommended by the OBSP, the Ministry of Health and the Canadian Task Force on the Periodic Health Examination.

The government of Ontario offers progressive monetary incentives for practices with rostered patients (capitation) that achieve target rates of women having had a mammography in the past two years (recently changed to 30 months). At the time of this study, fee-for-service physi-

cians were not eligible for these incentives. This incentive program does not appear to have influenced mammography rates in our study.

The OBSP provides practices with a reminder system that mails two letters to eligible women at 23 and 24 months. Although the number of practices reporting to have a recall system is small, this did not alter the mammography rates.

Most office visits are generated by symptoms or disease and frequently the visit is long enough to deal only with the presenting problems, not with preventive maneuvers. Though part of routine care provided by family physicians, a periodic health examination or preventive health care visit occurs less frequently. Without reminders or a structured recall system, physicians are less likely to order preventive maneuvers when focused on a specific disease or system. Reminders to perform maneuvers¹³⁻¹⁷ have been shown to improve preventive care but this requires an organized system within a computerized record that integrates data from internal and external sources to generate automatic reminders for due and overdue patients. In this study, 10 practices reported using electronic medical records. However, having an electronic record did not change the mammography screening rate.

The wide variation of rates (25-76%) was unexpected, although Van Harrison found a similar rate variance ranging from 3%-100%.⁷ Although the majority of practices (14/20) had rates between 50-60%, two practices had rates of less than 50%, and only four practices reached or surpassed the 70% target. Several factors can help understand the inter-practice variability. Population characteristics of the practices, such as ethnicity and socio-economic status, can influence patterns of practice. Maxwell found that Asian women were less likely to have a mammogram.⁵ Some physicians worked in part-time practices, having a total of 38 patients in the eligible age group, others in full-time practices with many women in the 52-71 age bracket. This is in striking contrast to Gann's study that reported a mean number of eligible patients as 21 across 132 practices.¹² Estimated practice size did not influence mammography rates.

Physicians having a particularly keen interest in preventive maneuvers may

attract patients who are like-minded. Preventive maneuvers may have a cumulative effect; because mammograms have been part of the practice for years, patients are accustomed to having more regular preventive maneuvers. Previous studies suggest that physician endorsement is important in encouraging patient participation in preventive programs.^{7,11,18} Physician endorsement was not assessed in this audit. The only factor that achieved a statistically significant difference was having patient educational material in the office. Having these materials had a negative influence on the rate of mammography. A possible explanation for this finding is that physicians with educational materials in their offices relied on the patients reading these materials to trigger requests for a mammogram rather than the physician taking the initiative.

Studies with the representative physicians to examine attitudes toward mammography, patient involvement in intervention decisions, and other characteristics would be useful. Facilitating discussion that explores differences in practice and attitude between physicians with relatively high mammography rates and those with lower rates may help with understanding practice differences. Reviews of other preventive maneuvers need to be undertaken that look for similarities in utilization of other screening tools.

The Ontario Breast Screening Program, set up to improve coverage of screening mammography via reminder systems, can be accessed either by self-referral or through family physicians' offices. Although every practice had some women who used OBSP, some physicians referred women to the service more regularly. Unfortunately, the number of women who were referred to the OBSP but who never used it could not be ascertained, so the denominator for calculating an OBSP mammography rate was indeterminate. One third of the eligible women in our study population used the OBSP. This is considerably higher than the 16% reported in the ICES study⁵ for all Ontario, but closer to the 23% reported for the same region as the practices in this study (Southern Ontario). Of the four practices with rates 70% or greater, two were routinely referring to OBSP and two were not. Some physicians prefer to maintain conti-

nity of care by dealing with preventive maneuvers such as mammography within their practices. Practices that did refer patients to the OBSP on a regular basis had a wide range of rates for women who used OBSP, indicating some disconnection between the perceived and actual use of the service.

Limitations

The denominator for the rates was arbitrarily chosen as women who had had at least one appointment in the past three years. This was based on Canadian data showing that 80% of patients in a practice would visit at least once in one year. Some of the practices had rostered patients, such that patients signed a contract with the physician to be enrolled in a practice. The physician receives a capitation fee to provide care for these patients. Capitated practices likely have more precise denominators than practices with non-rostered patient registries. The indeterminate denominators are expected to influence rates minimally. This chart review documented reported mammography, not ordered mammograms. Some women who find mammograms painful and anxiety-inducing⁸⁻¹⁰ will not follow through with an ordered mammogram.

Although the participating physicians had similar demographic factors to those published elsewhere,¹⁹ the study popula-

tion tended to be older and predominantly male. A majority of the sample (17/20) were teachers of family practice residents in Southern Ontario. The others were non-replicably sampled, significantly limiting the generalizability of our conclusions.

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RÉSUMÉ

Contexte : De nombreuses Canadiennes de 50 à 69 ans ne se soumettent pas à une mammographie tous les deux ans (l'intervalle de dépistage recommandé). Des données récentes donnent à penser que c'est le cas de plus de 50 % des Canadiennes dans le groupe d'âge visé, et que le fait de ne pas avoir de médecin de famille est un important facteur expliquant ce dépistage sous-optimal. Nous avons examiné les fiches médicales de 20 cabinets de médecine familiale pour déceler la fréquence des dépistages mammographiques effectués.

Méthode : Les rapports de mammographies dans les fiches médicales de toutes les patientes de 52 à 71 ans de 20 cabinets de médecine familiale ont été examinés pour la période de septembre 2003 à juin 2004.

Résultats : Dans les 20 cabinets, nous avons analysé 3 430 fiches de patientes admissibles âgées de 52 à 71 ans (moyenne = 173 femmes par cabinet; écart = 38 à 385). L'intervalle approprié de deux ans entre chaque mammographie était observé dans 58,8 % des cas (écart = 25 % à 76 % pour les 20 cabinets). Quatre cabinets affichaient un taux de dépistage de 70 % ou plus dans l'intervalle recommandé. Pour un intervalle de dépistage de 36 mois, le taux global de mammographie passait à 70 %. Ni la taille du cabinet, ni la méthode de rémunération, ni l'utilisation d'un dossier médical électronique, ni le sexe ou l'âge du médecin, ni le milieu de soins, ni le recours au Programme ontarien de dépistage du cancer du sein ne présentaient de corrélation significative avec les taux de dépistage mammographique.

Interprétation : Les taux de dépistage mammographique aux deux ans (l'intervalle recommandé) sont sous-optimaux chez les femmes ayant un médecin de famille. Les taux relevés pour les femmes dans cette étude, qui avaient toutes un médecin de famille, n'étaient que légèrement supérieurs aux taux déclarés ailleurs pour les femmes sans médecin de famille. D'autres études seraient nécessaires pour découvrir et supprimer les obstacles à un dépistage mammographique optimal.

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