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

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 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. 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 estimated the number of physicians who would reach each target level.
**TABLE II**

<table>
<thead>
<tr>
<th>Postulated Factors that Influence Mammography Rate (t-test)</th>
<th>Rate with Factor (%)</th>
<th>Rate without Factor (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of graduation before 1980</td>
<td>57.9 (SD 14.1; n=10)</td>
<td>56.8 (SD 4.4; n=7)</td>
<td>0.851</td>
</tr>
<tr>
<td>Practice size &lt;2000</td>
<td>56.8 (SD 13.5; n=10)</td>
<td>59.3 (SD 19.2; n=7)</td>
<td>0.687</td>
</tr>
<tr>
<td>Solo practice</td>
<td>57.7 (SD 16.2; n=8)</td>
<td>58.0 (SD 6.5; n=12)</td>
<td>0.944</td>
</tr>
<tr>
<td>Eligible for preventive care</td>
<td>56.3 (SD 4.3; n=5)</td>
<td>58.9 (SD 12.9; n=14)</td>
<td>0.663</td>
</tr>
<tr>
<td>Performance bonus</td>
<td>59.9 (SD 6.9; n=6)</td>
<td>54.8 (SD 17.9; n=13)</td>
<td>0.361</td>
</tr>
<tr>
<td>Uses computer for appointments</td>
<td>58.7 (SD 7.3; n=10)</td>
<td>57.6 (SD 14.9; n=9)</td>
<td>0.841</td>
</tr>
<tr>
<td>Uses EMR</td>
<td>55.0 (SD 16.8; n=6)</td>
<td>59.9 (SD 8.1; n=13)</td>
<td>0.401</td>
</tr>
<tr>
<td>Uses educational materials to remind patients</td>
<td>48.0 (SD 14.9; n=4)</td>
<td>61.1 (SD 8.8; n=15)</td>
<td>0.035</td>
</tr>
</tbody>
</table>

**TABLE III**

<table>
<thead>
<tr>
<th>Mammography Screening Rates at 24, 30 and 36 Months Prior to the Audit Date</th>
<th>% of Women</th>
<th>N of Women</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 24 months</td>
<td>58.9%</td>
<td>2007</td>
<td>58.9%</td>
</tr>
<tr>
<td>Within 30 months</td>
<td>7.8%</td>
<td>233</td>
<td>66.7%</td>
</tr>
<tr>
<td>Within 36 months</td>
<td>3.3%</td>
<td>46</td>
<td>70.0%</td>
</tr>
</tbody>
</table>

**TABLE IV**

<table>
<thead>
<tr>
<th>Distribution of Financial Incentives for Practices with Rostered Patients Having Various Mammography Rates</th>
<th>0-54</th>
<th>55-59</th>
<th>60-64</th>
<th>65-69</th>
<th>70-74</th>
<th>75+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (% of Practices)</td>
<td>7 (35.0)</td>
<td>5 (25.0)</td>
<td>4 (20.0)</td>
<td>0 (0.0)</td>
<td>2 (10.0)</td>
<td>2 (10.0)</td>
</tr>
<tr>
<td>Incentive</td>
<td>0</td>
<td>$220</td>
<td>$440</td>
<td>$770</td>
<td>$1320</td>
<td>$2200</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The overall mammography rate in this study was 58.8%. This corresponds closely to rates reported by Kasman for ICES and others, 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%. 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, suggests that there are common barriers to achieving higher rates. Obstacles to improved mammography screening have been documented from the perspective of patients. Van Harrison concluded that there were more patient population factors than personal physician factors contributing to mammography rates. In contrast, Gann, in an earlier study, concluded that mammography rates were related to specific physician office characteristics.

Although both theses 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 physicians 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 maneuvers 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%. Although the majority of practices 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. 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.

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.\textsuperscript{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 study\textsuperscript{5} 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 continuity 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-inducing\textsuperscript{8-10} will not follow through with an ordered mammogram. Although the participating physicians had similar demographic factors to those published elsewhere,\textsuperscript{19} the study population 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.

REFERENCES

Preparing for pandemic influenza: What family physicians should know

Family physicians play a major role in planning for and managing pandemic influenza. It is estimated that up to 35% of the population, including your staff and patients, will become clinically ill in the event of pandemic influenza and 0.4% of the clinically ill could die. This document outlines important steps that you should follow to ensure that your practice is prepared for a pandemic outbreak both in terms of infection control and service continuity.

Ask your Medical Officer of Health about your role during a pandemic influenza.

Ce que les médecins de famille doivent savoir en prévision d’une pandémie d’influenza

Les médecins de famille jouent un grand rôle dans la planification et la gestion d’une pandémie d’influenza. On estime que 35 % de la population, y compris parmi vos employés et vos patients, seront cliniquement malades lors d’une telle pandémie, et que 0,4 % des personnes cliniquement malades pourraient en mourir. Voici, dans ses grandes lignes, la marche à suivre pour vous assurer que votre cabinet est prêt à cette éventualité, tant du point de vue du contrôle de l’infection que du maintien des services.

Demandez à votre directeur de la santé publique quel serait votre rôle lors d’une pandémie d’influenza.

w w w . p a n d e m i c . c p h a . c a

A message from the Canadian Public Health Association and the College of Family Physicians of Canada.

Un message de l’Association canadienne de santé publique et le Collège des médecins de famille du Canada.