

Screening for new primary cancers in patients with metastatic breast cancer: a provincial analysis of the Choosing Wisely Canada recommendations

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ABSTRACT

Introduction Patients with metastatic cancer have a decreased life expectancy, and with screening and surveillance for new primary cancers, they run the risk of immediate harm with little chance of any benefit. Choosing Wisely Canada therefore recommends that such investigations be avoided in patients with metastatic disease.

Methods We examined cancer screening practices in a subset of patients with metastatic cancer in Newfoundland and Labrador. Patients with metastatic breast cancer seen at the provincial cancer clinic during 2014–2016 were identified from the Newfoundland and Labrador Cancer Registry. For each patient, we assessed whether any one or a combination of screening mammography, Pap (Papanicolaou) test, flexible sigmoidoscopy or colonoscopy, or fecal immunohistochemical test were performed at any point after the diagnosis of metastatic disease.

Results Of 305 patients with metastatic breast cancer, 114 (37.4%) underwent at least 1 screening investigation (mean: 2.92 investigations per screened patient). The most common screening investigations were mammography ($n = 197$) and Pap test ($n = 107$). Primary care providers ordered most of the screening investigations (70%); oncology specialists ordered 14%, and other specialists, 12%. Median overall survival for patients with breast cancer after a diagnosis of metastatic disease was 42 months, with a 5-year overall survival of 35.9%.

Conclusions A significant proportion of patients with metastatic breast cancer in Newfoundland and Labrador are still undergoing screening for new primary malignancies, which is discordant with oncology guidelines from Choosing Wisely Canada. Increased education strategies are needed if the Choosing Wisely Canada recommendations are to be implemented into routine clinical practice.

Key Words Choosing Wisely; Choosing Wisely Canada; breast cancer, metastatic; cancer screening; appropriateness of care

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INTRODUCTION

Although screening for breast, cervical, and colorectal cancers has been shown to reduce cancer-related mortality in healthy patients, recent meta-analyses have demonstrated a delay of 9.4–10.7 years for those survival benefits to emerge^{1,2}. In addition, many potential adverse events are associated with cancer screening, including anxiety secondary to false positives, unnecessary follow-up tests and procedures, and procedural complications such as

bowel perforation^{3–6}. Those considerations led Choosing Wisely Canada to make a recommendation to avoid routine cancer screening and surveillance for a new primary malignancy in patients with metastatic disease⁷.

Published in May 2015, the Choosing Wisely Canada oncology top 10 list outlines cancer-specific practices that are commonly performed despite evidence showing negligible benefit and the potential to cause harm. In patients with metastatic cancer, who have accordingly shortened life expectancies, screening investigations run the risk of

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immediate harm with little chance of the patient surviving long enough to benefit.

The purpose of the present study was to identify whether local practices in the province of Newfoundland and Labrador are in keeping with the Choosing Wisely Canada guidelines to avoid screening for new primary cancers in patients with metastatic cancer. Acquisition of baseline population-based data is an essential part of quality improvement initiatives and can be used to determine future knowledge translation strategies. Here, we report an excessive rate of inappropriate cancer screening in a cohort of patients with metastatic breast cancer (mBCa) in Newfoundland and Labrador.

METHODS

Study Design

Cancer screening practices were examined for a subset of patients with metastatic cancer—specifically, patients with mBCa. All patients with mBCa seen at the Dr. H. Bliss Murphy Cancer Centre in St. John's, Newfoundland and Labrador, during the 3-year period from 1 January 2014 to 31 December 2016 were identified in the Newfoundland and Labrador Cancer Registry ($n = 329$). Breast cancer oncologists assisted in determining which patients with breast cancer had metastatic disease, given the lack of specific International Classifications of Diseases coding for metastasis in the registry data. Male patients with breast cancer and patients diagnosed with metastatic disease after 1 January 2017 were excluded ($n = 24$).

Using individual electronic patient health records, we assessed whether screening with any one or a combination of mammography, Pap (Papanicolaou) test, screening colonoscopy or flexible sigmoidoscopy, and fecal immunohistochemical test was performed at any point after metastatic disease was diagnosed. Investigations were excluded if it was unclear from the health record whether they were ordered as part of screening or surveillance. Details of patient demographics, tumour characteristics, and the ordering physicians for screening investigations were also collected. Before initiation of study work involving patients outside eastern Newfoundland and Labrador, provincial ethics board approval was obtained (no. 2017.137).

Data Analysis

All data are presented descriptively as totals, means, medians, or proportions. Kaplan–Meier time-to-event methods were used to examine overall survival and the cumulative rate at which patients underwent screening investigations for new primary cancers. The analyses were conducted using the SPSS Advanced Statistics software application (version 20.0; IBM, Armonk, NY, U.S.A.). Patients were censored at date of death in the screening investigations analysis.

RESULTS

Of 329 mBCa patients identified, 305 met the inclusion criteria. Table 1 presents the baseline characteristics of the patient population, whose mean age at metastatic disease diagnosis was 61 years. Duration of follow-up from date of

TABLE 1 Demographics of the 305 patients in the study population

Variable	Value [n (%)]
Age at metastatic diagnosis (years)	
<50 Years	65 (21.3)
50–74 Years	191 (62.6)
≥75 Years	49 (16.1)
Regional health authority	
Eastern	204 (66.9)
Central	40 (13.1)
Western	51 (16.7)
Labrador–Grenfell	10 (3.3)

diagnosis of metastatic disease to either death or study end date (31 May 2017) ranged from 0 months to 178 months (median: 21 months). Median overall survival for these patients with breast cancer after a diagnosis of metastatic disease was 42 months, with a 5-year overall survival rate of 35.9% [Figure 1(A)]. That rate is slightly better than the 5-year relative survival rate of 27% for patients with breast cancer metastasized to distant sites or lymph nodes as reported by the U.S. Surveillance, Epidemiology, and End Results program⁸ and might be secondary to an incidentally larger subset of patients with more indolent metastatic disease in our sample.

Overall, 114 patients (37.4%) underwent at least 1 screening investigation (mean: 2.92 investigations per screened patient). After 24 months of being diagnosed with mBCa, only 58.4% of the patients still living had not received a screening investigation for a new primary cancer [Figure 1(B)]. In terms of the types of screening investigations, mammography was the most frequently ordered investigation ($n = 197$), followed by a Pap test ($n = 107$), a colonoscopy or flexible sigmoidoscopy ($n = 18$), and a fecal immunohistochemical test ($n = 11$) [Figure 2(A)]. The fact that this cohort involved women with breast cancer might explain why surveillance mammography was the investigation most frequently performed. Of all screening investigations, 70% were ordered by primary care providers; 14%, by oncologists; and 12%, by other specialists [Figure 2(B)]. In 4% of the investigations, the ordering physician was unidentifiable from the health record. The preventive care focus of primary care providers is likely accountable for the large number of screening investigations ordered by that physician group.

DISCUSSION

In patients with metastatic cancer, the survival benefit from routine cancer screening and surveillance for a new primary malignancy is generally outweighed by the potential harms of those tests and the mortality risks of metastatic disease. However, we determined that 37.4% of patients with mBCa in Newfoundland and Labrador underwent screening investigations, contrary to guidelines from Choosing Wisely Canada.

It has been shown that the time lag to a survival benefit from screening investigations for new primary cancer

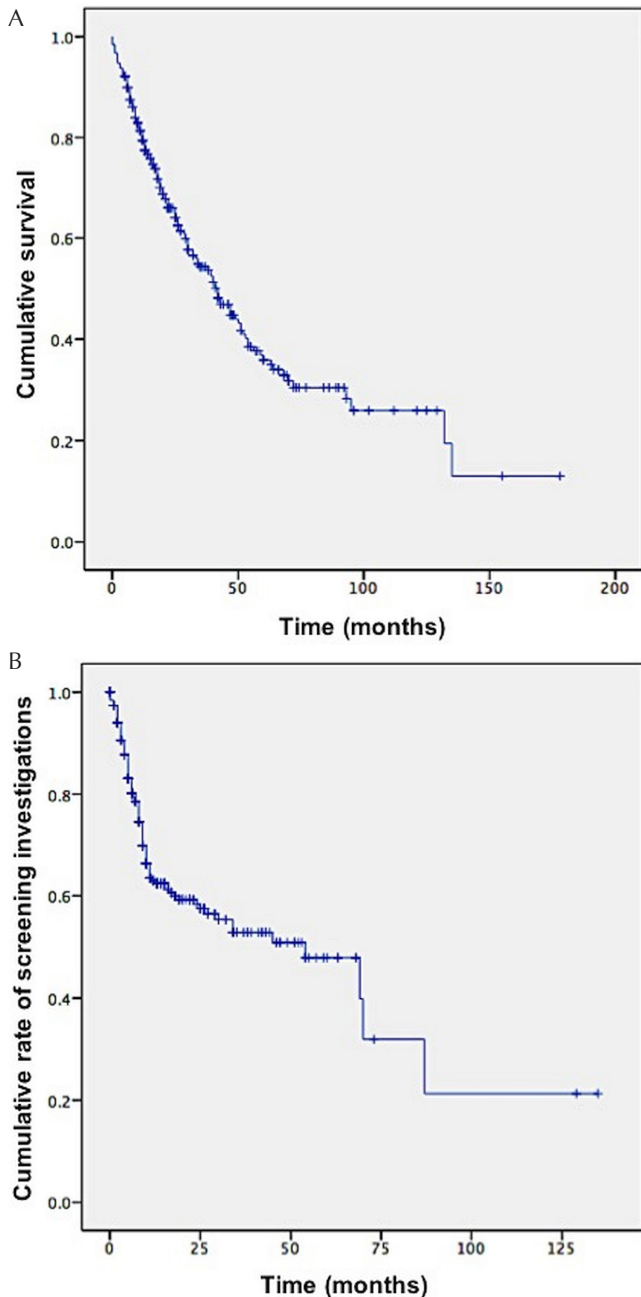


FIGURE 1 (A) Kaplan–Meier survival curve for patients with metastatic breast cancer. Crosshairs represent censored patients. (B) Kaplan–Meier time-to-event curve showing the cumulative rate of screening or surveillance investigations over time. Crosshairs represent censored patients.

ranges from 9.4 years to 10.7 years^{1,2}. However, patients in our study had a median overall survival of only 42 months [Figure 1(A)]. That duration is comparable to published U.S. Surveillance, Epidemiology, and End Results literature, which reports a 5-year relative survival of 27% for patients with breast cancer involving distant sites or lymph nodes⁸. Altogether, our results support the rationale that patients with metastatic cancer have life expectancies too short to receive any appreciable benefit from cancer screening. The cost-effectiveness of screening in this population is also debatable for the same reasons.

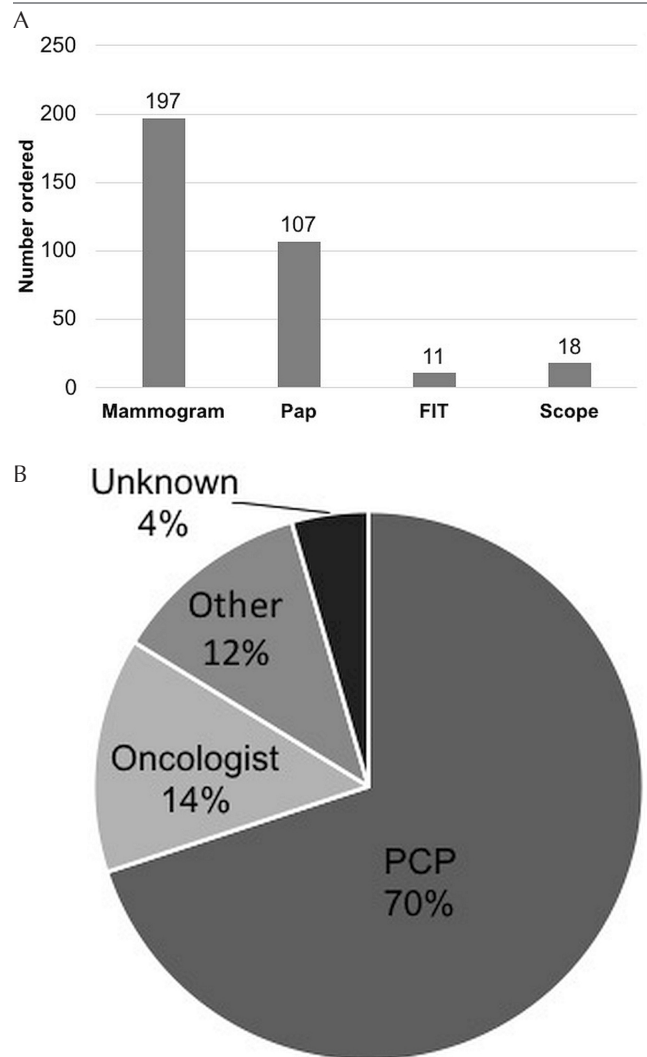


FIGURE 2 (A) Number of screening or surveillance investigations ordered by type. Pap = Papanicolaou test; FIT = fecal immunohistochemical test; Scope = flexible sigmoidoscopy or colonoscopy. (B) Proportion of screening or surveillance investigations ordered, by physician specialty. PCP = primary care provider; Other = other specialists.

The Choosing Wisely Canada recommendations acknowledge that screening can be considered for a small subset of patients with relatively indolent metastatic disease⁷. Of the 333 screening investigations ordered, a portion might have been appropriate. That portion would presumably consist of the tests ordered by oncology specialists, who would be most cognizant of an individual patient’s metastatic disease burden, thus questioning the appropriateness of the tests ordered by primary care providers and other specialists. Factors in Newfoundland and Labrador that could possibly be contributing to unnecessary screening include lack of explicit instructions by medical oncologists to other physicians about the discontinuation of screening and surveillance investigations upon development of metastatic disease, and physician retention issues in rural Newfoundland and Labrador communities that could result in unfamiliarity with the metastatic disease status of the patients. Systems-based approaches, such as

automatic removal of patients from screening outreach program lists if metastatic cancer is diagnosed, could serve to mitigate those issues.

The present study highlights a need for increased awareness in Newfoundland and Labrador about avoiding new primary cancer screening in patients with metastatic cancer. Ideally, future education strategies should be directed at physicians and patients, with the aim of facilitating shared decision-making and delivery of appropriate and patient-centred care.

Development of a cancer-specific top 10 list for the highly successful Choosing Wisely Canada campaign is a fundamental first step in disseminating research evidence and raising awareness about low-value oncology practices. However, it has previously been shown that simply publishing guidelines does not necessarily elicit practice change or improve health outcomes^{9,10}. Obtaining population-based data is a beneficial adjunct to the implementation of guidelines, and such efforts are already well under way with respect to Choosing Wisely Canada's oncology recommendations. For example, Tran *et al.*¹¹ examined rates of low-value radiation therapy practices—specifically, conventional fractionation as part of breast-conservation therapy for women with early-stage breast cancer and multifraction radiation therapy for palliation of bone metastases. Their analysis covered several provinces and found generally better adherence to guidelines than was seen in our study, although significant interprovincial variation was observed. Similarly, Enright *et al.*¹² found high rates of surveillance imaging being performed in patients with early breast cancer within the first 2 years after curative treatment. However, as in our study, most of those investigations were ordered by medical oncologists as opposed to primary care physicians. Our findings are similar to those of Singh *et al.*¹², who used population-based administrative health care databases from Ontario to examine screening tests for colorectal and breast cancer in patients with metastatic colorectal, lung, breast, or prostate cancer. Within 3 years of diagnosis, screening rates for colorectal cancer in patients with metastatic lung, breast, or prostate cancer were 3.9%, 11.9%, and 26.9% respectively. In women with metastatic colorectal or lung cancer, breast cancer screening rates were 13.1% and 10.2% respectively. However, that study did not look at cervical cancer screening or surveillance investigations¹³.

There are limitations to our study. First, it was a retrospective review of a 3-year period. Second, our data did not include details pertaining to physician rationale or patient preference for the screening investigations ordered, which are important considerations in determining their appropriateness. Finally, only patients with breast cancer were included in the analysis, which could limit generalizability of our findings to all patients with metastatic cancer.

CONCLUSIONS

A high rate of unnecessary cancer screening and surveillance for new primary cancers is being performed in patients with mbca in Newfoundland and Labrador, in discordance with Choosing Wisely Canada's oncology

recommendations. Lack of awareness on the part of physicians and patients about the significant harms and meagre benefits of screening investigations in patients with metastatic cancer is the likeliest reason for the observed practice patterns. More work is needed to implement Choosing Wisely Canada's guidelines in local practice and to improve the quality and safety of care being delivered to all oncology patients.

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CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology's* policy on disclosing conflicts of interest, and we declare that we have none.

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