



## Original article

# Barriers, beliefs and practice patterns for breast cancer reconstruction: A provincial survey



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## ARTICLE INFO

## Article history:

Received 24 September 2016

Received in revised form

3 December 2016

Accepted 19 December 2016

## Keywords:

Breast neoplasms/surgery

Female

Humans

Mastectomy

Surgical flaps

Survey

## ABSTRACT

**Background:** The purpose of this study was to characterize beliefs and practice patterns for breast cancer reconstruction among physicians who treat patients with breast cancer, in order to delineate current clinical practice. This survey was administered prior to Cancer Care Ontario guideline publication.

**Method:** Survey questions addressed four domains: survival, delayed or obscured recurrence detection, delayed adjuvant therapy, and aesthetics. The survey was administered to 1160 Ontario plastic and general surgeons and radiation and medical oncologists. Data were compared to published guidelines.

**Results:** The overall response rate was 48%, with 57% of respondents treating breast cancer. Of those treating breast cancer, 75% are affiliated with an academic center. Immediate breast reconstruction (IBR) is not available to 28%. Autologous reconstruction is thought to interfere with recurrence detection by 23% (oncologists 30%, surgeons 19%,  $p = 0.04$ ). For patients not expected to require radiation therapy, IBR is not supported by 30%. Autologous IBR is believed to delay delivery of adjuvant chemotherapy by 45% (oncologists 55%, surgeons 41%,  $p = 0.02$ ). Up to 42% of respondents believe delays in adjuvant therapy delivery following IBR are due to insufficient health care resources (ie. coordinating an oncologic and reconstructive surgeon). Radiation therapy following reconstruction is believed to have negative aesthetic outcomes, and increase the need for revision surgery.

**Conclusions:** Unfavourable beliefs about certain clinical actions do not align with recent provincial guideline recommendations. Insufficient healthcare resources are perceived to be a significant barrier to IBR and timely care.

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## 1. Background

The outcomes of mastectomy [1], and subsequent benefits of breast reconstruction are well characterized [2,3]. The proportion of women in Canada undergoing breast reconstruction is acknowledged to be low [4], despite it being an insured service under provincial healthcare systems [5]. Historically, reconstruction following mastectomy in Ontario was below 10%, and reported

as low as 3.8–5% in Nova Scotia [4]. Large cities support a two-fold higher rate of reconstruction versus small cities [6]. Recent estimates in Ontario reflect a growing demand, up to 23% by three years after mastectomy [7]. These proportions remain nearly half of those reported in the United States [8,9], despite more complex insurance factors. To address underutilization reflecting possible biases and barriers, breast reconstruction is now included in regional clinical practice guidelines in Ontario and Alberta [10,11].

Immediate breast reconstruction (IBR) is addressed within these provincial guidelines. It has well characterized benefits, including aesthetic, patient-reported, and economic outcomes [12–16]. Rates of IBR [17] and overall reconstruction [18] are quality indicators in

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breast cancer management. Significant variation in IBR rates exist within Canada [7,17], and internationally [19], with some rural areas still with no access. Without IBR available, reconstruction rates are reduced by at least half [20]. Within Ontario, geographic, institutional, and patient determinants of reconstruction have been investigated, with a focus on IBR [7,17].

Historic concerns pertaining to reconstruction include decreased survival, delayed or obscured recurrence detection, delay in surgery, delay in delivery of adjuvant chemotherapy and radiotherapy, and aesthetic consequences of post-reconstruction radiotherapy [21]. Consequently, many patients undergoing mastectomy were not referred to a plastic surgeon [22]. The literature reflects there is no significant difference in survival, disease free survival, recurrence and metastasis for IBR prospectively and in meta-analysis [23,24]. There is no clinically relevant delay in adjuvant chemotherapy delivery [25–27]. Alberta, NCCN, and now Ontario Cancer Care Ontario guidelines reflect these findings for breast cancer Stage I-IIIa [10,11,28]. Equipose remains in guidelines [28] and primary literature [29,30] for delivery and outcome of post-reconstruction adjuvant radiotherapy as a general recommendation, given poor aesthetic outcomes following radiation.

Recent research in Ontario has addressed the clinical, demographic, geographic, and physician workforce barriers to breast reconstruction [7,17]. However, no study has investigated the beliefs and practice patterns of the physicians themselves who treat breast cancer. Further, no study has analyzed perceived resource availability. From a knowledge translation perspective, the recent clinical practice guideline is necessary, but is not sufficient to impact practice [31]. To change practice, specific barriers [32] and physician biases need to be identified. The objective of this study is to characterize self-reported beliefs, practice patterns and barriers regarding breast reconstruction for all physicians providing breast cancer care in Ontario.

## 2. Methods

Research ethics board (REB) approval was obtained at our institution. A cross-sectional survey by postage mail was designed for specialists who treat breast cancer. The sampling frame included all potential physicians [33] in Ontario. All active general surgeons, plastic surgeons, medical oncologists, and radiation oncologists listed in the College of Physicians and Surgeons of Ontario as of August 2013 were included. “Surgical oncologist” is not a registered specialty, but was available for self-identification. Medical and radiation oncologists are herein referred to as “oncologists”, and plastic, oncologic and general surgeons as “surgeons”.

Development of the survey began with item generation. A review of the literature to identify physician barriers in the timing of breast reconstruction was performed using search terms and strategy from Platt et al. [5] Four domains were identified: 1) Decreased survival, 2) Delayed or obscured recurrence detection, 3) Delay in delivery of adjuvant chemotherapy and radiotherapy, and 4) Aesthetic consequences of post-reconstruction radiotherapy. Questions assessing each domain were generated during unstructured interviews with two local experts from each of the four specialties. Item reduction was completed resulting in 17 survey items with binary responses. Items explored beliefs or clinical actions associated with each domain (Appendix 1 - Survey).

Pilot testing was completed by 20 local physicians representing the four specialties, with feedback elicited in a semi-structured email for flow, wording, interpretability, and ease of administration [34]. Formal clinical sensibility testing was completed by two local experts in each specialty using a structured electronic form and Likert response format [35].

The survey was administered in English using postage mail to

maximize response. A cover letter including survey purpose, rationale for respondent selection [36], department stationary, signatures of investigators, assurance of confidentiality [37], estimated time required [33], and indication participation was important to survey success [35,38]. An addressed, stamped envelope was provided for responses. No incentive was provided. Responses were anonymous, using a four-digit code for each respondent. A second copy of the entire survey package was sent to all nonrespondents at two months. This was completed prior to Cancer Care Ontario (CCO) guideline publication in 2016. Responses were compared to relevant CCO recommendations [11].

Responses are expressed by self-identified specialty. Summary statistics were calculated for all survey responses. Each question was analyzed with a group-wise Chi-square test, and a single post-hoc pair-wise Chi-square test of one specialty versus the others. The post-hoc test was selected a priori, identifying the specialty each question targeted (eg. radiation oncology for field design, plastic surgery for aesthetic outcomes). Surgical oncology was combined with general surgery. For questions pertaining to multidisciplinary management or timing, surgeons versus oncologists were analyzed. P-value was not adjusted for post-hoc tests. For responses suggesting a delay in the delivery of adjuvant therapy with IBR, respondents were asked if the delay was due to resources (eg. coordinating a general and plastic surgeon for IBR), or clinical limitations (eg. post-operative wound, infection, tissue necrosis).

## 3. Results

### 3.1. Demographics

Overall, 1160 potential respondents were identified, including 595 general, 200 plastic surgeons, 189 medical, and 176 radiation oncologists. Of these, 557 were returned. The overall response rate was 48%. The first mailout received 379 responses (68% of total responses), and the second 178 (32%). Among respondents, 320 (57%) have an active clinical practice that included breast cancer patients; these respondents were analyzed (Table 1). Thirty-three percent practice in a university setting; there is a significant difference between specialties, group-wise  $p < 0.001$  (oncologists 56%, surgeons 22%,  $p < 0.001$ ). There are no differences in proportion of patients with breast cancer, or years in practice. No demographic data is available for nonresponders, precluding comparison to responders.

Overall, 53% of respondents utilize a clinical practice guideline, Table 1. The National Comprehensive Cancer Network guideline is the most common. There is no difference between specialties. IBR is available to 72% of respondents, Table 1. There is a significant difference between specialties, group-wise  $p < 0.001$  (plastic surgeons 98%, other specialties 66%,  $p < 0.001$ ).

### 3.2. Recurrence

Implant reconstruction is believed to delay/interfere with recurrence detection by 20% of respondents, Table 2. There is a significant difference between specialties, group-wise  $p = 0.001$  (oncologists 30%, surgeons 14%,  $p < 0.001$ ). Autologous reconstruction is believed to delay/interfere by 23%, Table 2. There is a significant difference between specialties, group-wise  $p = 0.005$  (oncologists 30%, surgeons 19%,  $p = 0.04$ ).

### 3.3. Timing of reconstruction

Presented with a hypothetical patient with Stage-I disease, not requiring adjuvant therapy, 92% of respondents would suggest reconstruction, no difference between specialties, Table 3. Among

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