

Differences in Rates of Immediate Breast Reconstruction in Canada and the United States: What Can We Learn?

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On the cusp of full implementation of the Affordable Care Act, there is great interest in the influence of this legislation on cancer care in the United States. Proponents of health care reform rightly note that markedly increasing the number of insured adults should result in increased access to cancer screening, preventive services, and treatment with downstream improvements in cancer mortality and patient outcomes.¹ Yet concern exists regarding potential for this legislation to exert unintended consequences, particularly through causing changes in payer mix and health care reimbursement.

An interesting perspective on the impact of health care payment system on cancer care comes from Zhong et al,² who evaluated breast cancer care within the single-payer Canadian health care system, where insurance status is not a barrier to accessing care. Specifically, Zhong et al evaluated patterns of immediate breast reconstruction (ie, reconstruction performed at the same time as mastectomy) for patients undergoing mastectomy to either treat breast cancer or prevent future breast cancer. Availability of breast reconstruction is an important component of multidisciplinary breast cancer care, given that reconstruction improves psychosocial quality-of-life outcomes such as body image.³⁻⁹ However, because breast reconstruction is inherently complex, is expensive,¹⁰ and does not influence classic cancer outcomes such as recurrence or survival, breast reconstruction may not be routinely available to patients in health care settings where scarce resources force rationing of care. Therefore, availability of breast reconstruction is an interesting marker of quality, one that may indicate a well-resourced medical system that can afford not simply to cure cancer but also to intervene to repair the physical and psychological damage done by cancer treatment.

Zhong et al report that, among women residing in Ontario, Canada, undergoing mastectomy, the percentage of women undergoing immediate breast reconstruction increased from 8.9% in 2002 to 16.0% in 2011. This increase was driven exclusively by an increase in immediate breast reconstruction for women undergoing mastectomy for prophylactic risk reduction or to treat in situ disease; use of immediate breast reconstruction for women with invasive cancer did not change. In multivariable analysis, factors associated with higher odds of immediate reconstruction included higher neighborhood-level income and the patient not being an immigrant. These findings suggest that even within the Canadian system, where lack of insurance is not a

barrier to care, sociodemographic factors still influence patterns of cancer care.

This description of immediate breast reconstruction patterns in the Canadian health care system is particularly salient when viewed in comparison with patterns from similar, recently reported studies on women in the United States.^{11,12} For example, Jagsi et al¹² recently reported trends in breast reconstruction for women in the United States with private insurance who underwent mastectomy to treat invasive breast cancer.¹² From 1998 through 2007, the rate of immediate breast reconstruction in such women increased from 34.4% to 50% ($P < .001$). In contrast, Zhong et al² report that, for women with invasive breast cancer in Ontario, the rate of immediate breast reconstruction was only 7.1% and did not increase between 2002 and 2011 ($P = .5$).

These findings reveal a stark difference between Canada and the United States in the use of immediate breast reconstruction for invasive breast cancer. Potential explanations for this difference include both patient and structural factors. From a patient perspective, it should be noted that the mean age in the study by Zhong et al² was 60.6 years, whereas the median age in the study by Jagsi et al¹² was 52 years. Given that older women are less likely to have breast reconstruction, the difference in immediate reconstruction rates between the two populations would be attenuated, although not eliminated, if rates were age-standardized. Another patient factor could be cultural differences between Canada and the United States leading to different preferences for immediate breast reconstruction. However, much of the research suggesting a quality-of-life benefit from breast reconstruction was conducted outside the United States,^{4-6,9} so it is unlikely that the benefits of breast reconstruction and related preferences regarding this procedure would differ substantially between the United States and other countries. Another relevant patient factor is location of residence, particularly whether metropolitan or rural. Given that patients in rural areas typically must travel farther for care, it may be more difficult to coordinate the multiple provider visits needed to facilitate breast reconstruction for rural patients. However, only 16.6% of the population in the study by Zhong et al² resided in rural areas, similar to the proportion of the US population that resides in rural areas (approximately 19%).¹³ Thus, it is unlikely that differences in the distribution of metropolitan versus rural residence could

account for observed differences in Canadian versus US reconstruction rates.

Structural factors likely account for much of the difference between the two countries in the use of immediate breast reconstruction. For example, Zhong et al² found that odds of immediate breast reconstruction were twice as high for patients who underwent mastectomy at a hospital with two or more plastic surgeons versus zero or one plastic surgeons. Jagsi et al¹² reported that reconstruction rates were higher if patients lived in a state with a high density of plastic surgeons.¹² These findings provoke the hypothesis that differences in the supply of plastic surgeons between the United States and Canada may be an important cause of the difference in breast reconstruction rates. For example, there are 1.25 plastic surgeons per 100,000 individuals in Ontario, Canada (169 plastic surgeons for a population of 13.5 million), versus 2.15 per 100,000 in the United States (6,835 plastic surgeons for a population of 317 million), a nearly twofold difference in supply. In addition, the findings from Jagsi et al² indicated that a minimum of three plastic surgeons per 100,000 individuals was needed to optimize reconstruction rates, suggesting that the current supply of plastic surgeons in Ontario is likely inadequate. The observation by Zhong et al² that only 20.7% (40 of 193) of hospitals in Ontario had two or more plastic surgeons supports the hypothesis that differences in reconstruction rates may relate to the supply of plastic surgeons.

Substantial undersupply of plastic surgeons in Canada is also suggested by prior literature. When surveyed in the mid-2000s, 79% of responding Canadian plastic surgeons felt there were not enough plastic surgeons in Canada, and one third reported routinely working over 80 hours per week.¹⁴ In addition, wait times for elective plastic surgery consultation were approximately 8 months nationwide, with a high of 22 months in the province of Saskatchewan. Even for urgent consultations, wait time was 11 days. This unfavorable practice environment may explain why nearly one quarter of recently trained plastic surgeons in Canada opt to leave the country and practice elsewhere.¹⁴ The shortage of plastic surgeons in Canada has been ascribed in part to cost-cutting policy changes instituted in the 1990s by the Canadian government that decreased medical school enrollment by 10%.^{15,16}

Given physician supply issues, the Canadian Society of Plastic Surgeons developed benchmarks for appropriate wait times. With regard to mastectomy and immediate breast reconstruction, Canadian plastic surgeons felt that the maximum acceptable wait time from referral to surgery should be no more than 4 weeks, which seems acceptable by any standard.¹⁷ However, although wait times for many surgical procedures are actively tracked by provincial health ministries, wait times for mastectomy with immediate breast reconstruction are not, which raises concerns that perhaps this benchmark is not currently attainable. In addition, the benchmark for time from plastic surgeon consultation to delayed breast reconstruction is 182 days, but current practice in Ontario fails to meet that benchmark, as the delay is currently 293 days (benchmarks and delay are calculated as the time it takes nine of 10 patients to go from plastic surgeon consultation to having the procedure).¹⁸

This long wait time for delayed breast reconstruction is not solely the result of insufficient numbers of plastic surgeons. In a recent survey of Canadian surgeons, lack of available operating room time was the number-one cause of delay, with 68% of surgeons identifying this issue.¹⁹ Long delay to breast reconstruction

is perhaps the explanation for why use of immediate breast reconstruction in Canada only increased in patients without invasive breast cancer. Such patients can afford to wait for plastic surgery without compromising their cancer outcome, whereas patients with invasive breast cancer generally cannot.

Collectively, these findings suggest a system that may be under-resourced and thus unable to consistently provide immediate breast reconstruction for invasive breast cancer. Whereas government-sponsored, universal health care affords numerous advantages for cancer care, the Affordable Care Act in the United States has chosen a different direction, seeking to expand private insurance and Medicaid to facilitate coverage of most Americans. As these changes take effect, it will be vitally important to monitor their influence on cancer care. Within this context, use of immediate breast reconstruction is likely to be an important bellwether, signaling the extent to which the health care system maintains the full complement of resources needed to not just cure cancer but also repair the damage caused by treatment.

AUTHOR'S DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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