

# Bariatric Surgery in Canada

## La chirurgie bariatrique au Canada

*Obesity rates for Canadian adults are much higher today than in the past; however, rates of bariatric surgery, a treatment for high-risk severely obese individuals, have not risen in parallel.*



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### Abstract

Obesity rates for Canadian adults are much higher today than in the past, raising questions about how to achieve healthy weights and mitigate the associated health risks. While not a solution at the population level, bariatric surgery may be a treatment option for a relatively small proportion of obese individuals. In Canada, unlike in the United States, no consistent trend was evident in the use of this surgery

between 1996–97 and 2003–04 across the five provinces for which comparable data were available. In 2003–04, bariatric surgeries were performed predominantly for women (87%); the average length of stay in hospital was 5 days; and 1.4% of patients were readmitted to hospital within 7 days of their discharge after surgery.

## Résumé

Les taux d'obésité chez les adultes canadiens sont beaucoup plus élevés aujourd'hui que par le passé, ce qui suscite des questions sur les façons d'atteindre un poids santé et de réduire les risques associés à l'obésité. Bien que ce ne soit pas une solution qui convient à l'ensemble de la population, pour un faible pourcentage de personnes obèses, la chirurgie bariatrique peut constituer un choix de traitement judicieux. Contrairement aux États-Unis, on n'a décelé, au Canada, aucune tendance soutenue quant au recours à cette intervention entre 1996–1997 et 2003–2004 dans les cinq provinces pour lesquelles des données comparables étaient disponibles. En 2003–2004, la majorité des chirurgies bariatriques ont été pratiquées sur des femmes (87 %); la durée moyenne du séjour à l'hôpital était de 5 jours et 1,4 % des patients ont dû être hospitalisés à nouveau dans les sept jours suivant l'obtention de leur congé de l'hôpital.

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**A**S IN MANY COUNTRIES, THE PREVALENCE OF OBESITY AMONG CANADIAN adults is much higher than it was 25 years ago (Colquitt et al. 2005). According to the most recent Canadian Community Health Survey, nearly one-quarter (23.1%) or 5.5 million Canadian adults were obese (defined by a body mass index [BMI] of 30 kg/m<sup>2</sup> or more) in 2004 (Tjepkema 2005). Further, 2.7% of respondents were morbidly obese (BMI of 40 kg/m<sup>2</sup> or more), with women twice as likely as men (3.8% versus 1.6%, respectively) to be morbidly obese (Tjepkema 2005).

Studies show that adults who are obese are more likely to have high blood pressure, coronary heart disease, strokes, diabetes, gallbladder disease, some cancers and musculo-skeletal disorders (Bellanger and Bray 2005). Emerging evidence also links obesity to some psychological and social disorders (White et al. 2004). Obesity also places a financial burden on the healthcare system, costing an estimated \$1.6 billion or 2.2% of total direct healthcare expenditures in Canada in 2001 (Katzmarzyk and Janssen 2004).

A wide variety of options from an individual to a societal level have been proposed to promote healthy weights (McGrail 2004). Potential therapeutic interventions are diverse. Examples include approaches to promote dietary change, alterations in physical activity and behaviour modification and drug therapy. For selected high-risk individuals, bariatric surgery may also be a treatment option (Colquitt et al. 2005).

Bariatric surgery is usually considered a last resort for morbidly obese individuals who have attempted non-surgical approaches but who have not lost weight permanently (Colquitt et al. 2005). Ontario guidelines, for example, indicate that surgery should

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be restricted to people with morbid obesity or with a BMI of at least 35 kg/m<sup>2</sup> and serious co-morbid conditions (Medical Advisory Secretariat, Ontario Ministry of Health and Long-Term Care 2005). Other considerations include a propensity for weight loss and absence of periop-

erative risk factors and eating disorders (Colquitt et al. 2005). According to a recent systematic review, bariatric surgery is generally effective for sustained weight loss and improvements in associated co-morbid conditions for individuals who are candidates for the surgery (Colquitt et al. 2005). Despite the narrow indications for bariatric surgery, rising obesity rates in the Canadian population have led to questions about whether a corresponding increase in the use of this procedure has occurred.

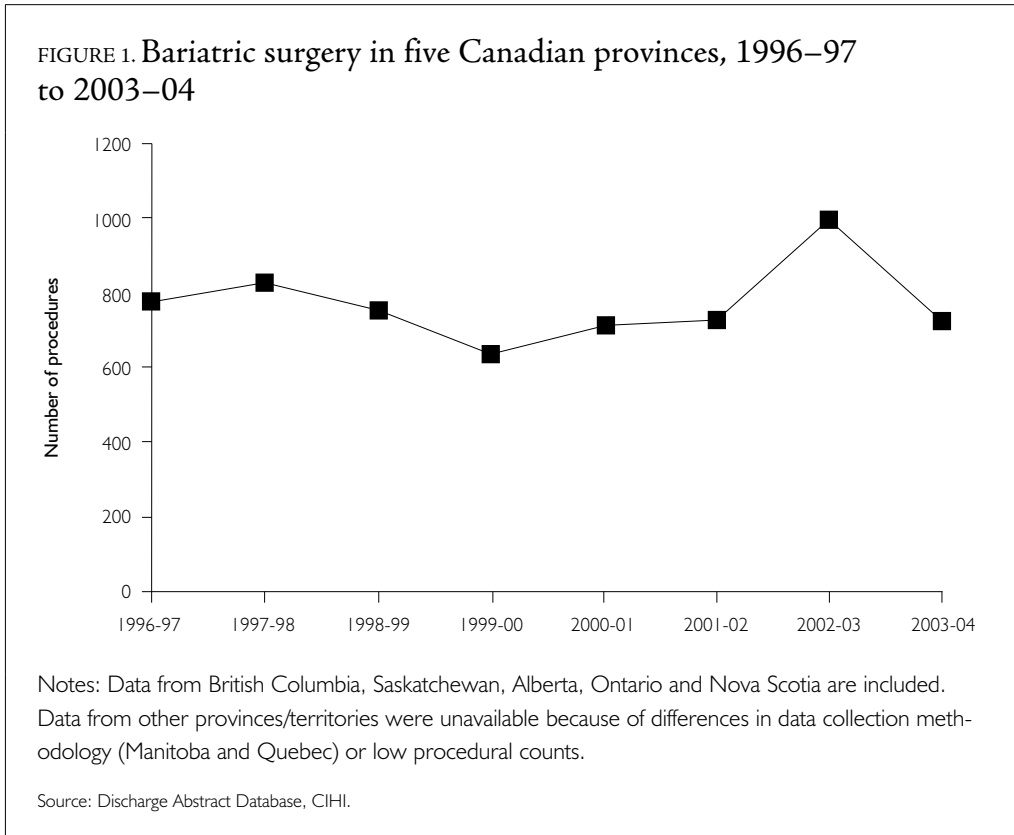
## Methods

### Data source and study population

We identified patients who had undergone bariatric surgery in hospitals in five provinces (British Columbia, Saskatchewan, Alberta, Ontario and Nova Scotia) between April 1, 1996 and March 31, 2004, using the Discharge Abstract Database of the Canadian Institute for Health Information. While bariatric surgery can be performed in conjunction with other diseases (e.g., cancer), here we focus on those surgeries performed for the purpose of weight reduction. In 1996–97, 57% of those who underwent bariatric surgical procedures (i.e., gastric bypass surgery) during this period had a concurrent diagnosis of obesity; in 2003–04, this percentage had increased to 64%. Bariatric surgery performed for weight reduction was identified using ICD-10-CA/CCI, ICD-9, ICD-9-CM procedure codes accompanied by diagnostic codes for obesity. The procedure codes were 1.NF.78^^ (CCI); 56.2, 56.93, 56.59 (ICD-9); and 44.31, 44.39, 44.69 (ICD-9-CM). The obesity codes were E66 (ICD-10); 278.0, 278.8 (ICD-9); and 278.00, 278.01, 278.88 (ICD-9-CM).

## Data analysis

The annual frequencies of bariatric surgeries were calculated at both the provincial and combined level. Surgical procedure counts were based on where the procedures were performed, not on where the patients lived. Provincial/territorial results were excluded if fewer than five procedures were performed annually. For 2003–04, socio-



demographic characteristics, lengths of stay and readmission rates were also examined. Patients' residential postal codes were used to derive income quintiles based on an approach developed by Statistics Canada that assigns quintiles to neighbourhoods according to income data reported on the 2001 Census (Wilkins 2004). Only urban area postal codes were used in this analysis to minimize socio-economic misclassification (Wilkins 2004).

## Results

Between 1996–97 and 2003–04, a total of 6,150 bariatric surgery procedures were performed on patients with a concurrent diagnosis of obesity in the five provinces.

Annual numbers of procedures varied across the years but no consistent trend was evident. The provision of these services varied across the country. In all provinces for which data are available, annual numbers fluctuated across the study years. For example, in Ontario there was a 57% increase from 2001–02 to 2002–03. This increase was not sustained the following year and is largely responsible for the overall peak in procedures performed in 2002–03 (Figure 1).

In 2003–04, 724 bariatric surgeries were performed on patients with a concurrent diagnosis of obesity in the five provinces. The vast majority of patients (86.9%) were women. The mean age of patients was 39 years, but surgery was conducted for patients younger than 19 and over 65 years of age. In urban areas, one in six patients (15%) came from the highest-income quintile neighbourhoods. The remaining patients were about equally likely to be from neighbourhoods in one of the other four quintiles of the income distribution (range, 20%–23%).

TABLE 1. Bariatric surgery in selected provinces in Canada\*, 2003–04

	NUMBER OF PROCEDURES	MEAN AGE (YEARS)	% FEMALE	MEAN LOS (DAYS)
British Columbia	109	41	88	3.0
Alberta	224	37	91	5.5
Saskatchewan	41	39	83	10.3
Ontario	303	40	84	4.9
Nova Scotia	47	39	85	6.4
<b>Total</b>	<b>724</b>	<b>39</b>	<b>87</b>	<b>5.2</b>

\*Excludes Manitoba and Quebec because of differences in data collection methodology and provinces/territories where fewer than five procedures were performed annually.

Source: Discharge Abstract Database, CIHI.

On average, the length of stay for these procedures was 5.2 days but differed within and across the provinces. Saskatchewan, for example, had the highest average lengths of stay (Table 1). These differences in lengths of stay may result from a variety of factors, including higher numbers of more invasive procedures being used in some jurisdictions as well as differences in patient populations. Across all provinces, lengths of stay in 2003–04 ranged from one to 61 days.

In the same year, over 99% of patients were discharged to their place of residence following recovery from the surgery. Readmission rates were 1.4% within the first seven

days after discharge; they rose to 6.4% when the first 30 days post-surgery were considered. Surgical complications were primarily responsible for readmissions to hospital.

## Conclusion

Bariatric surgery has been performed for more than 50 years in the United States but has recently gained increased attention due to rising obesity rates (Hydock 2004). According to Santry et al. (2005), the number of bariatric surgeries performed in the United States with a confirmed diagnosis of obesity increased from 13,365 in 1998 to 72,177 in 2003. Analysis of hospitalizations for bariatric surgery with a diagnosis of obesity in five provinces in Canada between 1996–97 and 2003–04 did not reveal a similar trend. While the numbers of surgeries performed fluctuated annually both

across Canada and provincially, there was no consistent trend.

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Use of bariatric surgery in Canada may differ from that in the United States. However, in some cases Canadians may be seeking care outside of the country. For example, the number of Ontario residents who had approved gastric bypass

surgery procedures (adjustable gastric banding procedures were not reported) in the United States increased from eight in 2002–03 to 346 at the time of reporting for 2004–05 (Medical Advisory Secretariat, Ontario Ministry of Health and Long-Term Care 2005). Including out-of-country procedures in future analyses using supplemental data may improve our understanding of how the use of bariatric surgery is changing in Canada.

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