

Bariatric Basics

Trends, Guidelines, Solutions, and Attitudes



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Bariatrics (from the Greek word *baros*, meaning weight) is an emerging term to describe the field of medicine that addresses medical problems associated with morbid obesity (Deitel & Melissas, 2005; Sharma, 2005). The term bariatrics applies to a morbidly-obese population in the same way geriatrics applies to an elderly population (Sharma, 2005). Obesity (Body-Mass Index [BMI] $>30\text{kg/m}^2$) and morbid obesity (BMI $>40\text{kg/m}^2$) affect over 300 million persons worldwide (Padwal & Lewanczuk, 2005). Recent surveys conducted have indicated that the prevalence of obesity continues to rise in Canadian adults (Katzmarzyk, 2002).

BODY-WEIGHT CLASSIFICATION GUIDELINES

In 2003, Health Canada established the Canadian Guidelines for Body Weight Classification in adults to classify levels of obesity (Health Canada, 2005). The guidelines are based on the BMI that can be calculated by an individual's weight in kilograms divided by the square of their height in meters. The BMI is used to indirectly estimate fat and predict health risks such as cardiovascular risks and diabetes. Individuals can be classified into one of six health risk categories based on BMI (WHO Expert Consultation, 2004) (Table 1).

GUIDELINE CONSIDERATIONS

When using BMI to classify an individual into one of the health risk categories, it is important to note that several other factors need to be considered (e.g. age, ethnicity, physical fitness) (Douketis, Paradis, Keller & Martineau, 2005). In short, not everyone who

has a high or low BMI value is outside the healthy range.

First, elderly persons (aged 65 years or older) who are classified as overweight by their BMI may not be at an increased risk for health problems. Since fat loss is often associated with increased risk of death in the elderly, the normal BMI range for older patients is between 22 and 29 kg/m^2 . In contrast, normal BMI for younger adults is 18.5 to 24.9 kg/m^2 .

Second, the BMI cut-off points for overweight and obese individuals are based on health risks observed in Caucasian populations. Asian persons are at a higher risk for disease at a lower BMI and are considered to be overweight and obese at 23 kg/m^2 and 27 kg/m^2 , respectively. In contrast, Black persons are at lower risk than Caucasian persons with the same BMI.

Lastly, athletes tend to have a higher BMI due to their muscular physique. Thus, BMI is not necessarily indicative of health problems, and each case needs to be evaluated individually. The BMI cut off of 25 kg/m^2 can sensitively detect "most overweight people and does not erroneously detect over-lean people" (Porth, 2005).

PREDICTING HEALTH RISKS USING BODY-MASS INDEX AND WAIST-CIRCUMFERENCE

Dr. James Douketis, an associate professor at McMaster University, and his colleagues (2005) suggest that both Waist Circumference (WC) and BMI are useful in determining health risks posed by adiposity. Based on a large population-based cohort study in the United States, findings suggest that a person with a normal BMI and increased WC may have an abdominal body fat distribution and thus an increased risk of health

Health Risk Classification According to Body Mass Index (BMI) <i>Risk of Developing Health Problems</i>	Classification	BMI category (kg/m^2)
Increased	Underweight	< 18.5
Least	Normal Weight	18.5 - 24.9
Increased	Overweight	25.0 - 29.9
High	Obese Class I	30.0 - 34.9
Very High	Obese Class II	35.0 - 39.9
Extremely High	Obese Class III	≥ 40.0

Table 1: Health risks based on Canadian Guidelines for Body Weight Classification (WHO Expert Consultation, 2004).

Waist Circumference	BMI Category		
	Normal 18.5-24.9 kg/m ²	Overweight 25-29.9 kg/m ²	Obese Class I 30-34.9 kg/m ²
Men: < 102 cm Women: < 88 cm	Least Risk	Increased Risk	High Risk
Men: ≥ 102 cm Women: ≥ 88 cm	Increased Risk	High Risk	Very High Risk

Figure 1: Using BMI and WC to predict health risks as opposed to BMI alone (Douketis et al., 2005).

problems (Janssen, Katzmarzyk & Ross, 2002). For example, this study shows that among those with a BMI of 30–34.9 kg/m², an increased WC confers a greater than 14-fold increased risk for certain diseases among women, but a lesser increase in risk among men. Figure 1 summarizes the conclusion of this study and is an additional resource for clinical care practitioners in developing a preliminary prognosis of heavy patients.

However, using both WC and BMI to estimate health risks posed by adiposity is dependent on proper measurement of WC. Unlike the proper method to measure WC shown in Figure 2, WC is usually incorrectly measured around the hip region (Douketis et al., 2005).

PREDICTING HEALTH RISKS USING WAIST-TO-HIP RATIO

Dr. Salim Yusuf, a McMaster University of Professor of Medicine and INTERHEART Investigator, recently suggested that Waist-to-Hip Ratio (WHR) will likely become the new gold standard due to its higher predictive power of cardiovascular risk between ethnicities in 27 098 participants in 52 countries (12 461 cases and 14 637 controls) (Yusuf et al., 2005). Their study published in *The Lancet* found that the WHR shows a graded and highly significant association with myocardial infarction risk worldwide. The study also stated that the redefinition of obesity based on WHR instead of BMI increases the estimate of myocardial infarctions attributable to obesity for most ethnic groups. However, an international debate has resulted as the study was criticized for including haphazard controls and not being prospective according to Dr. Willet, a Harvard University Professor (Milne, 2005).

Ideally, BMI cut-off points adjusted for age and athleticism for each ethnicity might be set - a concept commonly referred to as duality. However, dual cut-off points between ethnicities or nations are controversial and may also be confusing. Opponents suggest that dual cut-off points may have poor effects on clinical practice, epidemiology and policy. The implications of accurate cut-off points to define levels of obesity are stated in Table 2 (WHO Expert Consultation, 2004).

TWO HAMILTON INITIATIVES

Dr. Arya M. Sharma is a McMaster University Professor of Medicine and the Canada Research Chair in Cardiovascular Obesity Research and Management. He recently played a major role in establishing Canada's first Obesity Network (CON-RCO). The network is intended to connect everyone from the general public, industry, government, and researchers on issues of obesity. With 20% of the population projected to have BMIs' exceeding 40 kg/m² (morbidly-obese) by 2020, the initiative is a measure to address the obesity epidemic.

Dr. Sharma is also working to establish a centre to provide medical treatment for bariatric patients that is to be located at St. Joseph's Hospital. This is one of Canada's first initiatives to house a state-of-the art bariatric centre and staff. Considerable resources are being used to offer complete pre- and post-operative care for bariatric surgery.

Each year, approximately 100 000 bariatric surgeries are performed in the United States compared to Canada's 1100 (Padwal & Lewanczuk, 2005). Figure 3 shows the trends of surgical

Policy

- Inform and trigger policy action
- Facilitate prevention programs
- Measure effect of interventions
- Estimate burden of risk based on population attributable risks (Epidemiology)

Epidemiological

- Ascertain cause of disease by looking at:
 - Association with health outcomes within populations
 - Association of health outcomes across populations

Clinical

- Identify high-risk individuals for screening
- Identify individuals for absolute risk assessment
- Determine the type and intensity of treatment
- Monitor individuals for effects of treatment over time

Table 2: Uses of cut-off points (WHO Expert Consultation, 2004).

bariatric procedures performed in Canada. Last year, OHIP paid for approximately 600 patients to travel to the United States for surgery, costing the province \$13 to \$14 million (Benady, 2005).

Dr. Sharma has recommended that these funds be redirected to the establishment of facilities and skills among health care providers in Canada to ensure care for the increasing morbidly obese population. This money could be used to perform twice as many bariatric surgeries in Ontario. Conservative estimates by the Ontario Health Technology Assessment Advisory Committee suggest that 3800 surgeries are needed in Ontario per year (Medical Advisory Secretariat, 2005). Indeed, several of the 150 000 morbidly obese persons in Ontario might qualify for surgery. (Benady, 2005).

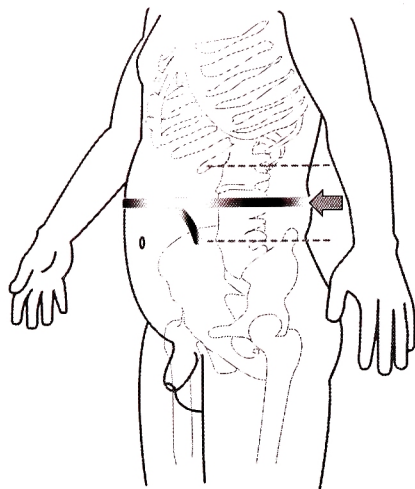


Figure 2: Proper technique to measure waist-circumference. A measuring tape is placed around the trunk between the lower costal margin and the iliac crest while the patient is standing with feet about 25-30 cm (10-12 in) apart. The measuring tape is fit snugly around the abdomen but without compressing underlying soft tissue. The waist circumference is recorded to the nearest 0.5 cm (1/4 in) at the end of a normal expiration. (Douketis et al., 2005).

TRENDS

Prevalence of obesity (classes I, II and III) has steadily risen between 1985 to 2003 in Canada (Kamarzyk & Mason, 2006). In class III obesity alone, there has been a 225% increase between 1990 and 2003 (Figure 4).

Though obesity in Canada remains lower than in the United States (Figure 5), similar trends have been reported for an increase in prevalence of class III obesity.


BIAS & DISCRIMINATION

Surgical procedures such as stomach stapling have been criticized and are controversial among the general public. Bariatric surgery is perceived as a cosmetic intervention rather than a medically necessary treatment. Many Canadians believe that obese patients need to “stop being lazy” and simply go on a diet to lose weight instead of expending pharmacological, surgical and psychological resources to correct obesity (Puhl & Brownell, 2001). Contradictory to the beliefs of many physicians today, Hippocrates wrote, “Corpulence is not only a disease itself, but the harbinger of others” recognizing that obesity is a disorder that increases the risk of various co-morbidities.

The story of Gina Score, described by Puhl & Brownell (2001), highlights the nature of discrimination and reality that obese persons face in our society. Gina was sent to a Juvenile-detention camp for a minor theft. She was characterized as a sensitive individual who was academically successful. Weighing 224 pounds at a height of 5'4", she faced difficulties with everyday physical exercises. At the camp, she was forced to run 2.7 miles on a hot day and was “prodded and cajoled by instructors” the entire way. Unable to catch her breath, she collapsed on the ground. Despite her cyanotic lips and incoherent babbling, instructors sat nearby drinking sodas, laughing and chatting while accusing Gina of faking. Four hours after lying in the sun, an ambulance was called – her organs had failed. Gina died.

Obese persons face systematic discrimination and bias in many aspects of their lives. In one study, parents treated their obese daughters differently than their non-obese daughters: obese daughters were less likely to receive financial support for their education (Crandall, 1995). In another study, a scripted interview was videotaped and made into two copies. One copy was modified to make the candidate seem obese. Fewer job offers were extended to the obese candidate when compared to the non-obese candidate. The study concluded that obese persons were more likely to be denied jobs and promotions (Pingitore, Dugoni, Tindale & Spring, 1994). Other studies show the bias and discrimination faced by obese persons in settings including education, health care, as well as within existing policies.

Many health care providers fail to acknowledge obesity as a disease, and thus do not treat it. In two older clinical studies involving 318 and 1200 patients, respectively, physician attitudes towards obese persons were poor (Klein, Najman, Kohrman & Munro, 1982; Price, Desmond, Krol, Snyder & O'Connell, 1987). In the first study, 66% of physicians said obese “patients lacked self-control”, 39% said “obese patients were lazy”, 23% did not recommend treatment options and 47% stated that counseling patients on weight loss was inconvenient. In the second study, only 18% of physicians discussed weight management with overweight patients and 42% discussed weight management with mildly obese patients. There are many similar studies with nurses, some of which report more adverse reactions to patients (Hoppe & Ogden, 1997; Maroney & Golub, 1992; Bagley, Conklin, Isherwood, Pechiulis & Watson, 1989).

Currently, there is a division in attitudes towards obese patients. Some maintain the beliefs of Dr. Walker who, in his nationally syndicated newspaper column, suggested that “...for their own good and the good of the country, fat people should be locked up in prison camps” (Solovay, 2000). Others like Dr. Sharma believe in treatment and compassion towards obese patients: “...Governments too easily sloughed off the problem with advice to the public to ‘eat more fruit and vegetables’ and ‘walk more,’ which are all right for prevention, but do nothing for the morbidly obese. . . . We don't send people who have colon cancer home to eat more fibre” (Benady, 2005). 

Annual number of bariatric surgical procedures in Canada, 1993-2003

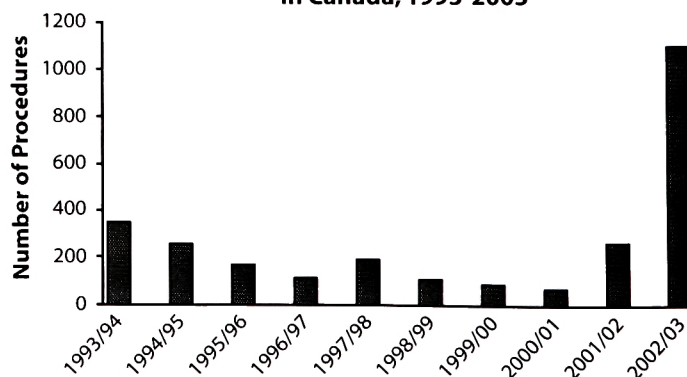


Figure 3: Annual number of bariatric surgical procedures in Canada, 1993-2003 (Padwal & Lewanczuk, 2005).

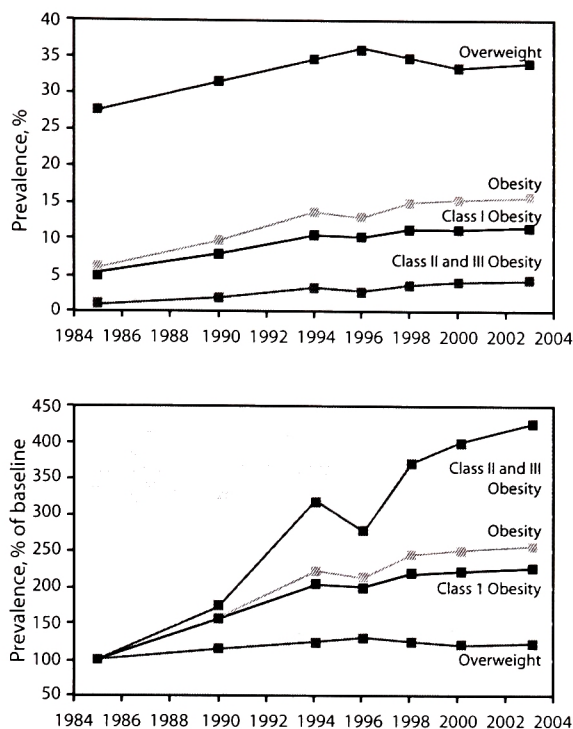


Figure 4: Prevalence of overweight and obesity (classes I-III) in Canada, 1985–2003. Top: Changes in absolute prevalence. Bottom: Changes relative to baseline (1985 = 100%) (Kamarzyk & Mason, 2006).

Canadian adult obesity rates lower than United States

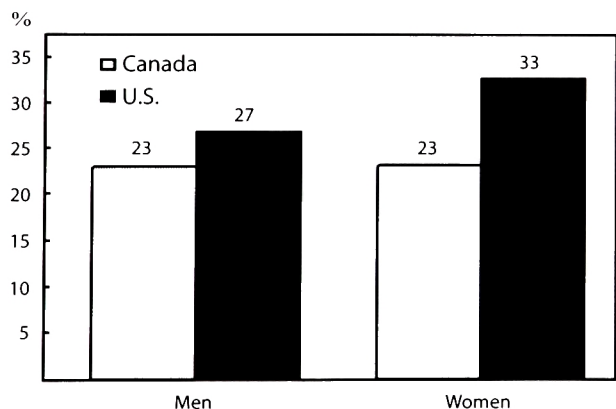


Figure 5: Canadian adult obesity rates lower than United States (Statistics Canada, 2005).

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