Obesity in Adults:
What You Need to Know

Vikram Chandurkar, MD, FRCPC
Presented at Memorial University's Wednesday at Noon—Ask the Consultant Program, December 2007.

The prevalence of obesity in adults is rising rapidly in Canada. Obesity has a significant impact on a variety of disease states and organ systems. The BMI is the most widely used method of measuring degree of obesity (Table 1).

Another relatively new and easy-to-use measure of obesity is the waist-hip ratio. A ratio of waist circumference to hip circumference > 0.9 in women and > 1.0 in men, is associated with a higher risk of morbidity and mortality. A waist circumference of > 40 inches (102 cm) in men or > 35 inches (90 cm) in women is the cutoff for being overweight.

Table 1
BMI

• BMI:	$\frac{\text{weight (kg)}}{\text{height (m}^2\text{)}}$
• Normal:	19-24.99
• Overweight:	25-29.99
• Obese:	30-39.99
• Morbidly obese:	> 40

Epidemiology

According to the Canada Community Health Survey, 2004, obesity rates in people aged ≥18 were 23.1%. In absolute numbers, this translates into 5.5 million people ≥ 18-years-of-age. The percentage who were overweight was 36.1% (8.6 million). In 1978/79, Canada's obesity rate had been 13.8%—there has been a substantial increase over time.[1]

To quantify the impact of obesity, we can look at its effect on life expectancy. An analysis of the Framingham data showed:[3,4]

- Overweight non-smoking males had a 30-year mortality that was 3.9 times that of non-smoking males of desirable weight
- Non-smokers with a BMI > 25 at age 40 lost 3.1 to 3.3 years of life expectancy
- Years of life lost with a BMI > 45 were 13 years for white men and eight years for white women

Optimal BMI based on evidence

In a prospective study of > 1 million adults in the US (457,785 men and 588,369 women), 201,622 deaths occurred during 14 years of follow-up. In healthy people who had never smoked, the nadir of the curve for BMI and mortality was found at a BMI of 23.5 to 24.9 in men and 22.0 to 23.4 in women.[5]

Table 2

Complications of obesity

Many disease entities are caused or exacerbated by obesity:[2]

CV
- Hypertension
- Congestive heart failure
- Cor pulmonale
- Varicose veins
- Pulmonary embolism
- Coronary artery disease

Endocrine
- Metabolic syndrome/Type 2 diabetes
- Dyslipidemia, polycystic ovary syndrome
- Amenorrhea, infertility, menstrual disorders

Musculoskeletal
- Hyperuricemia and gout
- Immobility
- Osteoarthritis (knees and hips)
- Low back pain

Respiratory
- Dyspnea
- Obstructive sleep apnea
- Asthma

Neurologic
- Stroke
- Idiopathic intracranial hypertension
- Meralgia paresthetica

GI
- Gastroesophageal reflux disease
- Non-alcoholic fatty liver disease
- Cholelithiasis
- Hernias
- Colon cancer

Psychologic
- Depression/low self-esteem
- Body image disturbance
- Social stigmatization

Genitourinary
- Urinary stress incontinence
- Hypogonadism (male)
- Breast and uterine cancer
- Pregnancy complications

Dermatologic
- Striae distensae (stretch marks)
- Stasis pigmentation of legs
- Lymphedema
- Cellulitis
- Intertrigo, carbuncles
- Acanthosis nigricans, skin tags

Approach to the patient

The key is to provide a nonjudgmental, compassionate environment and overcome subliminal prejudice. Obese people tend to have significant social problems due to their obesity and establishing a rapport is crucial to the success of any treatment. An obesity-focused history should be taken focusing on the chronologic history of weight gain, response to previous weight loss attempts, effects of excess weight on health and expectations from a weight management program. The many different complications of obesity are listed in Table 2.

Many drugs in current use cause weight gain including olanzapine, clozapine corticosteroids, insulin, sulfonylureas, thiazolidinediones, *etc*. Minimizing the use of such medications or substituting them with other drugs less likely to cause weight gain may be an option to be explored.

Treatment options

Options for treatment include diets, commercial weight loss programs, support groups, medications, exercise programs, behaviour modification and bariatric surgery. A diet designed to cause weight loss must achieve a calorie deficit

Table 3

National Institutes of Health criteria for surgery

- BMI > 40 or BMI > 35 with a comorbidity
- Failure of a trial of non-operative management
- Patient should understand the procedure and its risks
- No medical or psychological contraindications

of 500 kcal/day to cause a weight loss of 1 lb in one week. More severe caloric restriction increases the rapidity of weight loss, but not the rate of long-term success in maintaining a reduced weight. Exercise promotes long-term maintenance of reduced weight. Behaviour modification administered by a clinical psychologist helps to develop adaptive thinking and alter eating and exercise habits.

Rimonabant is a new drug which blocks a cannabinoid pathway (CB1) and causes weight loss. It is in Phase 3 trials and is not yet available in Canada.

Medications

- Appetite suppressants
- Medications that block nutrient absorption

Sibutramine is available at a dose of 10 mg/day to 15 mg/day. Over six months, patients lose 5% to 8% of their initial body weight as compared to 1% to 4% for placebo. Weight loss is maintained for up to two years on treatment. Side-effects include hypertension, dry mouth, headache and constipation.

Orlistat is available at a dose of 120 mg and is taken one hour before a meal. It causes excretion of approximately one-third of the ingested fat. It acts by binding to GI lipases in the lumen and preventing digestion of dietary fat. In trials, weight loss was 9% as compared to 5.8% in the placebo group. Side-effects can be troublesome, such as:

- flatulence with discharge,
- fecal urgency,
- steatorrhea,
- fecal incontinence,
- oily spotting and
- increased frequency of defecation.

Side-effects led to discontinuation of the drug in a significant number of patients. Patients should be educated that eating low-fat meals will minimize side-effects. Another consideration is decreased absorption of fat-soluble vitamins (especially vitamin D)—these should be supplemented.

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Bariatric surgery

Surgery is indicated in a subgroup of obese patients (Table 3).[6]

Procedures can be classified as follows:

- Restrictive procedures: reduce the effective size of the stomach and create early satiety
  - Vertical banded gastroplasty
  - Gastric banding

- Malabsorptive procedures: create iatrogenic malabsorption reducing calories absorbed
  - Biliopancreatic diversion
- Restrictive - malabsorptive
  - Gastric bypass

In terms of long-term evidence, the landmark Swedish Obese Subjects (SOS) trial[7] showed that bariatric surgery is effective at keeping weight off over a 15 year span and relatively safe (surgical mortality 0.25%). A 24% reduction in long-term mortality was demonstrated in patients who underwent surgery—the hazard ratio for subjects who underwent bariatric surgery, as compared with control subjects, was 0.76 (95% confidence interval, 0.59 to 0.99; P=0.04), with 129 deaths in the control group and 101 in the surgery group. Long-term surgical outcomes depend on patient compliance with dietary restrictions and regular follow-up. The choice of therapy must be individualized.

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Conclusion

Obesity is not just a medical condition, it is a societal illness. Current therapies have significant adverse effects and limited long-term efficacy (other than surgery)—a multidisciplinary approach is the most effective. Reversal of long-term lifestyle habits is achievable by only a minority of patients. Primordial prevention must be targeted at the school age population to achieve long-term shifts in prevalence. As our understanding of mechanisms improves, new pharmacologic targets may become available.

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Dr. Chandurkar is an Assistant Professor of Medicine, Division of Endocrinology, Memorial University of Newfoundland, St. John's, Newfoundland.

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