

Guidelines for Canadian bariatric surgical and medical centres: a statement from the Canadian Association of Bariatric Physicians and Surgeons

Pierre Garneau, MD
Stephen Glazer, MD
Timothy Jackson, MD
Sharadh Sampath, MD
Kenneth Reed, MD
Nicolas Christou, MD
Joseph Shaban, MD
Laurent Biertho, MD

Accepted Mar. 8, 2021

Correspondence to:

Pierre Y. Garneau
Univeristé de Montréal
100 chemin Rockland, suite 140
Mont-Royal, QC H3P 2V9
dr.pgarneau@bell.net

Cite as: Can J Surg 2022 March 9;
65(2). doi: 10.1503/cjs.020719

SUMMARY

The goal of this statement is to offer standardization in bariatric care across Canada, to provide patients with optimal access to obesity treatment and potentially improve outcomes by reducing complications, length of hospital stay and readmission rate. The definition of Canadian standards also aims to promote a comprehensive, multidisciplinary approach to patients with obesity, to define the minimal qualifications for surgical and medical training and to offer credentialing for bariatric surgical and medical centres. In addition, we emphasize the importance of developing a national registry for the assessment of quality of care across the country and to evaluate outcomes of long-term treatment. These recommendations are based on expert opinion as well as the most recent clinical evidence.

The Canadian Association of Bariatric Physicians and Surgeons (CABPS) represents Canadian specialists interested in the treatment of individuals living with obesity and provides professional educational development, coordination and promotion of common goals. According to the Public Health Agency of Canada and the Canadian Institute for Health Information,¹ one-quarter of Canadian adults are living with obesity (body mass index [BMI] > 30 kg/m²). Projections suggest that if nothing new and effective is done to mitigate this trend among adults, obesity will affect more than one-third of Canadian adults by 2031. When obesity is combined with overweight (BMI 25–30 kg/m²), the prevalence in Canada in 2014 was 61.8% of men (8.2 million) and 46.2% of women (6.1 million). In addition, the prevalence of severe (class II-III) obesity (BMI > 35 kg/m²) has increased exponentially, with a 225% increase in Canada between 1990 and 2003.² According to data from Statistics Canada, more than 830 000 Canadian adults are living with class II obesity (BMI > 35 kg/m²) and 370 000 with class III obesity (BMI > 40 kg/m²).

In parallel to this phenomenon, over the last 2 decades we have witnessed a dramatic increase in the incidence of type 2 diabetes (T2D), which now affects 10% of the adult population. Most T2D (80%) is attributed to excess adiposity, and T2D has become the leading cause of chronic kidney disease, blindness and nontraumatic amputation. In 2017, the incidence of T2D was 13.7%, compared with 3.6% among those classified as having a healthy weight.³

The demand for bariatric care is increasing; hence, the need for adequately trained health care professionals with expertise in bariatric medicine is becoming ever more important. Both the population and the medical profession require access to quality care in bariatric medicine and surgery. It is therefore imperative to have a coordinated framework for delivering high-level care to our patients. The association between the volume of bariatric surgical procedures and complication rates has been

described. Altieri and colleagues⁴ reported that the risk for any complication and 30-day readmission following Roux-en-Y gastric bypass (RYGB) decreased with increasing RYGB volume up to a specific volume (248 cases/yr) and stabilized afterward. Celio and colleagues⁵ reported that surgeons performing a high volume of sleeve gastrectomies (> 50 cases/yr) had lower 30-day complication, reoperation and readmission rates than those performing a lower volume (< 50 cases/yr). Hollenbeak and colleagues⁶ reported that patients treated by low- (< 50 cases/yr) and medium-volume (50–100 cases/yr) surgeons and hospitals had increased 30-day mortality rates compared with high-volume (> 100 cases/yr) surgeons and hospitals.

For this reason, CABPS has developed these guidelines for bariatric physicians and surgeons and dedicated centres for the delivery of multidisciplinary care for patients living with obesity. The goal of this statement is to increase standardization in bariatric care across Canada, to provide patients with optimal access to obesity treatment, and to potentially improve outcomes by standardizing medical and surgical training and outcomes reporting. The objective is also to promote a comprehensive, multidisciplinary approach to patients living with obesity and to define the minimal qualifications for surgical and medical bariatric training. In addition, we want to promote the development of a national registry for the assessment of quality of care across the country and to evaluate long-term surgical and medical outcomes. The purpose is to provide guidance for the creation of high-quality centres for the management of this complex multisystem chronic and relapsing disease.

GUIDELINE DEVELOPMENT

The CABPS Executive Committee identified the creation of Canadian bariatric guidelines as an important step to improve clinical bariatric practice in Canada. A subcommittee (the Standards Committee) was created under the leadership of the CABPS past president (L.B.) and 2 co-chairs (P.G. and T.J.). Guiding principles were determined and committee members were selected to ensure a broad expertise in both bariatric surgery (L.B., P.G., T.J., S.S., N.C.) and bariatric medicine (S.G., J.S.) and for their geographical representation (Quebec, Ontario, British Columbia). Members of the committee provided the overall vision and oversight for the guideline process and were responsible for writing the different sections. This was not a formal literature review, but rather a consensus statement process. Lead authors were responsible for identifying the most relevant and up-to-date references and guidelines in the literature and adapting them to the bariatric environment in Canada. The committee met in person in May 2018 and May 2019 and at least every other month by phone during the

development process. The sections were discussed in order to include insight from the different members in the guidelines.

The first version of the manuscript was reviewed by the CABPS Executive Board ($n = 16$) and modified accordingly. It was then sent to CABPS members, who acted as external reviewers, for comments, and additional modifications were made. The CABPS membership is national and includes all specialists involved in the field of obesity management (e.g., nutrition specialists, mental health professionals, nurses). CABPS staff and consultants ($n = 3$) provided administrative support and project coordination for the guideline development process. These guidelines were inspired by the 1991 National Health Institute Consensus Conference,⁷ the 2016 American Society for Metabolic and Bariatric Surgery (ASMBS) and American College of Surgeons standards manual,⁸ and the policies and procedures of the American Board of Obesity Medicine.⁹

Scope

The main target users of these guidelines are physicians and surgeons working in the field of bariatric medicine and surgery. These recommendations are intended to serve as a guide for health care professionals who are already working in this field, who are starting a new bariatric practice, or who are seeking to improve their current practice. Clinical discretion should be used by all who adopt these recommendations; the recommendations should be viewed as guidance to improve bariatric care. It is the responsibility of the weight loss medical/surgical program to determine individual needs based on local resources and accreditation requirements. The guidelines may also be used by health care administration and policy-makers.

DEFINITION OF BARIATRIC/METABOLIC SURGERY

Bariatric/metabolic surgery is defined as the treatment of severe obesity and its associated diseases (e.g., T2D, dyslipidemia, sleep apnea) with surgical procedures tailored to the clinical needs of the patient. The appropriate surgical approach should be selected using current evidence-based medicine. Patients with a BMI of 40 kg/m² or greater without coexisting medical problems and for whom bariatric surgery would not be associated with excessive risk should be eligible for at least 1 of the procedures. Patients with a BMI of 35 kg/m² or greater and 1 or more severe obesity-related comorbidities remediable by weight loss, including T2D, hypertension, hyperlipidemia, obstructive sleep apnea (OSA), obesity hypoventilation syndrome (OHS), Pickwickian syndrome, nonalcoholic fatty liver disease (NAFLD), nonalcoholic steatohepatitis (NASH),

pseudotumour cerebri, gastroesophageal reflux disease (GERD), asthma, venous stasis disease, severe urinary incontinence, debilitating arthritis, or considerably impaired quality of life, may also be offered a bariatric procedure.^{7,10} In addition, bariatric surgery should be considered for patients with poorly controlled T2D and class I obesity (BMI 30–35 kg/m²) despite optimal medical management.¹¹

A laparoscopic technique should be the standard approach in elective bariatric surgery. An open approach should be considered only in exceptional situations (i.e., patients with multiple previous abdominal surgeries, complex revisional surgery or intraoperative difficulties requiring conversion).

A particular obesity surgical procedure is deemed acceptable in the Canadian health care environment when this surgical care restores or improves deficit in physical and mental well-being attributable to obesity; is provided as a program supported by multiple health disciplines in a durable, long-term environment; and is safe and produces durable efficacy, as shown by high-quality medical evidence.

Bariatric surgical procedures performed in Canada

The bariatric surgical procedures currently performed in Canada are sleeve gastrectomy, RYGB, biliopancreatic diversion with or without duodenal switch (BPD-DS), adjustable gastric banding, single anastomosis gastric bypass, and single anastomosis duodenoileostomy with sleeve gastrectomy (SADI-S). However, adjustable gastric banding, based on current clinical knowledge and expert opinion, is not currently recognized as a durable surgical option for weight loss because of its long-term revision rate of more than 50%.¹² In addition, single anastomosis gastric bypass and SADI-S lack long-term data and are not yet accepted by all international bariatric societies. Institutional review board (IRB) protocols and consent, as well as collection of long-term data, are recommended when performing these procedures.

Gastric balloon and other endoscopic procedures

Different endoscopic options have emerged over time, but their long-term effectiveness is typically low. Gastric balloons have the largest body of scientific data, although evidence supporting their long-term effectiveness is insufficient. The committee agrees that gastric balloon could be considered as a “bridge” procedure to surgery. The balloon cannot stay permanently in the stomach, and weight regain usually occurs after removal. Caution should be used when advising patients on the potential long-term benefits of this procedure.¹³

DEFINITION AND SUGGESTED TRAINING FOR BARIATRIC SURGEONS

A bariatric surgeon is a general surgeon with a special interest in bariatric surgery and devotes a substantial proportion of their time to treating severe obesity using any of the bariatric surgery procedures outlined in the previous section.

The general requirements for newly trained bariatric surgeons, modified from the core curriculum of the ASMBS fellowship training requirements,¹⁴ are as follows.

- Satisfactory completion of a general surgery residency followed by a bariatric or minimally invasive surgery fellowship. We suggest that minimal standards set by the ASMBS be met. The fellow must have been exposed to more than 1 type of weight-loss surgery and must have participated in at least 100 bariatric operations. The fellow should have assumed the role of primary surgeon, defined as the individual who performed the key component of the operation, in at least 50% of cases.
- Participation in a minimum of 50 procedures with a gastrointestinal anastomosis, and a minimum of 40 “restrictive” operations and 5 revisional procedures as well as exposure to bariatric-specific emergency procedures (leaks, bowel obstruction, internal hernia, gastrointestinal hemorrhage or ulcers).
- Exposure to and/or extensive teaching of bariatric-specific endoscopy (e.g., preoperative and postoperative upper gastrointestinal [GI] endoscopy, ulcer, dilation, stent placement)
- Participation in 50 preoperative evaluations, 100 postoperative inpatient management encounters and 100 postoperative outpatient evaluations.
- Completion of at least 36 hours of documented metabolic surgery continuing medical education (CME) credits in the areas of preoperative evaluation, postoperative management, benefits of laparoscopic surgery, gastric bypass, biliopancreatic diversion, revisional surgery, sleeve gastrectomy, nutritional deficiencies, obesity in childhood and adolescence, outcomes of metabolic surgery, and the role of endoscopy.

Requirements for established surgeons who wish to perform metabolic surgery are as follows.

- Completion of an established didactic course on metabolic surgery.
- Completion of at least 36 hours of documented bariatric surgery CME credits at a bariatric surgery meeting or at other accredited obesity courses.
- Successful completion of 25 laparoscopic cases procotored by a surgeon credentialled for laparoscopic bariatric surgery.¹⁵
- Review of the surgeon’s first 5 independent cases by a designated committee, including the institution’s chief of surgery.

CABPS recognizes that at the time of formulating these guidelines, there are a number of established general surgeons performing bariatric surgery safely and effectively. Some of them pioneered bariatric surgery in Canada and acquired their skills before bariatric fellowships were established. The CABPS standards committee recommends that these surgeons continue to practise the discipline of bariatric surgery within the scope of these guidelines. If the surgeon has performed only open bariatric operations, they may not be credentialled for laparoscopic operations.

Ongoing training requirements include the performance of or assistance in 50 primary weight-loss operations per year, documentation of long-term (> 5 yr) patient follow-up, and documentation of 12 hours of obesity surgery CME credits per year.

Additional general requirements

A bariatric surgeon should have a good understanding of the etiology, physiology and pathology of obesity; the ability to identify psychosocial issues as well as complications and nutritional issues relevant to metabolic and bariatric surgery; and a sound understanding of other therapeutic options and outcomes.

DEFINITION AND SUGGESTED TRAINING FOR BARIATRIC PHYSICIANS

Bariatric medicine is an area of medical specialization dedicated to the understanding of the etiology, consequences and treatment of abnormal body fat deposition (adiposity) resulting in impaired health, increased medical risks and organ dysfunction. In 1985, the National Institutes of Health (NIH) convened a health consensus development conference on the implications of obesity and designated obesity as a specific disease entity requiring treatment by trained physicians.³ Thirty years later, the recognition of obesity as a complex chronic disease is still lacking at many governmental levels.¹¹

An obesity physician should have a good understanding of the pathologic consequences of excess adiposity as well as expertise in the medical, behavioural, nutritional and surgical management of obesity. Certification in obesity medicine is available currently through the American Board of Obesity Medicine,⁹ and is recommended for medical specialists willing to devote a substantial proportion of their practice to the management of obesity.

Qualifications for certification, modified from the policies and procedures of the American Board of Obesity Medicine,⁹ are as follows.

- Licence from the province or jurisdiction in which the applicant currently practises medicine.
- Completion of medical residency in Canada or the United States, or the equivalent training.

- Completion of a minimum of 60 hours of documented CME credits on the topic of obesity. The CME credits must include at least 30 credits earned through attendance at 1 or more “Group One” meetings (Obesity Medicine Association Conference, Obesity Week, CABPS Conference, Canadian Obesity Network [CON] Conference). The remaining 30 CME credits may be completed through attendance at additional Group One meetings or through Group Two meetings, which include at-home CME activities and/or attendance at other live meetings where obesity is the specific educational topic.

DEFINITION OF CANADIAN BARIATRIC SURGERY CENTRES

Level 1 bariatric surgery centre

A level 1 bariatric surgery centre must be part of a fully accredited tertiary care hospital. The uniqueness of a level 1 bariatric surgery centre is that it has the capacity to offer best practice treatment for all bariatric/metabolic surgery patients, regardless of comorbidity or size. The objective of creating level 1 bariatric surgery centres is to meet the highest standards in terms of medical expertise, teaching, and research and outreach, similar to level 1 Canadian trauma centres.¹⁶

To be designated a level 1 bariatric surgery centre, the centre must perform a minimum of 250 bariatric surgeries annually; offer at least 2 accepted bariatric surgical procedures; offer revisional surgery; have a bariatric surgeon as its director; have at least 2 additional bariatric surgeons, with each bariatric surgeon performing a minimum of 50 bariatric surgeries annually; and ensure long-term follow-up (> 5 yr) of patients after bariatric surgery.

Recommendations on the minimum staffing and facility requirements for a level 1 bariatric surgery centre are listed in Box 1 and Box 2, respectively. For centres performing more than 250 cases per year, these recommendations should be adjusted accordingly.

Level 2 bariatric surgery centre

Bariatric surgery may be performed in centres that do not qualify for level 1 designation; such hospitals are designated as level 2. They may provide high-quality care, with a minimum of 100 bariatric operations performed annually by a minimum of 2 credentialled bariatric surgeons, each of whom performs at least 50 primary bariatric operations per year.

Level 2 bariatric surgery centres should treat only lower-risk patients, defined as those younger than 65 years with a BMI of less than 55 kg/m² (men) or less than 60 kg/m² (women), weight less than 220 kg, and an American Society of Anesthesiologists (ASA) classification below III.

Box 1. Recommendations on the minimum staffing requirements for a level 1 bariatric surgery centre

Staff

- Chief bariatric surgeon/director ($n = 1$)
- Bariatric surgeons ($n = 2$)
- Pre-/post-surgery bariatric physicians ($n = 1$)
- Dedicated bariatric nurse ($n = 1-2$)
- Bariatric-trained nutritionists ($n = 2$)
- Exercise physiologist ($n = 1$)
- Mental health specialist ($n = 1$)
- Program manager ($n = 1$)
- Database manager ($n = 1$)

Consulting staff available within the centre

- Endocrinologist or internal medicine specialist ($n = 1$)
- Cardiologist ($n = 1$)
- Respirologist ($n = 1$)
- Gastroenterologist ($n = 1$)
- Radiologist ($n = 1$)
- Anesthesiologist ($n = 1$)

Comprehensive endoscopy services

- Gastroenterologist or endoscopy-trained surgeon with therapeutic endoscopy training and interest in bariatric surgery
- 24-hour coverage 365 days a year

Discharge and follow-up plan

- Bariatric surgeons
- Bariatric physicians
- Bariatric nurse clinicians
- Patient's primary care physician
- Postoperative long-term follow-up and rehabilitation

The requirements for critical care, endoscopy and imaging services and emergency care are similar to those for level 1 centres. If these services are not available within the level 2 centre, there must be a written transfer agreement in place with a level 1 centre capable of managing the full range of complications of bariatric surgery.

Level 3 bariatric surgery centre

Level 3 bariatric surgery centres agree to limit their bariatric surgeries to those that can be performed as out-patient procedures (< 24 h) in low-risk patients, defined as those younger than 65 years with a BMI of less than 55 kg/m² (men) or less than 60 kg/m² (women), weight less than 220 kg, and an ASA classification below III.¹⁷ These centres should perform 50 or more laparoscopic procedures annually, with at least 1 credentialed bariatric surgeon performing at least 50 primary weight-loss operations annually. There must also be a written transfer agreement in place with a level 1 centre capable of managing the full range of complications of bariatric surgery.

DEFINITION OF CANADIAN BARIATRIC MEDICINE PROGRAMS

A bariatric medical program is defined as a medical weight loss program for adults 18 years and older with

Box 2. Recommendations on the minimum facility requirements for a level 1 bariatric surgery centre

Facility adapted to patients living with morbid obesity

- Customized chairs
- Examination rooms with adapted tables
- Large-capacity weight scale and height measuring tools
- Dietician consulting room
- Nurse clinician consulting room

Operating rooms (minimum of 1)

- Basic set-up (e.g., gases, floor plans)
- Anesthesiology equipment
- Bariatric surgical bed (400 kg capacity)
- Double towers/screens for laparoscopic surgery
- High-flow insufflator
- Advanced energy generator
- Laparoscopic bariatric surgery sets
- Bariatric retractors and open surgery sets
- Access to intraoperative endoscopy

Recovery room (3:1 nursing)

- Regular recovery room beds
- ECG monitors
- Oxygen saturation monitors
- Ventilator capability
- Emergency resuscitation cart
- Overnight monitoring capability

Critical care services

- Step-down beds dedicated to program
- Shared critical care beds with bariatric beds
- 24-hour critical care physician coverage 365 days a year

Ward (4:1 nursing)

- Private or semi-private rooms with bariatric beds
- Oxygen saturation devices
- ECG (portable) monitoring
- Heavy-duty walkers
- Large wheelchairs
- Lifts (450 kg capacity)
- Adapted showers with proper supports

Comprehensive imaging services

- CT scanner capability
- Upper GI capability
- Ultrasonography capability
- Access to radiologists with training in percutaneous drainage

Ancillary services and procedures

- 24-hour ED 365 days a year
- Dialysis facilities for acute renal failure
- Mandatory outcomes reporting
- Quality-improvement program
- Evidence-based guidelines, clinical pathways and algorithms
- Continuing education program for all staff

Patient selection process

- Patient education/counselling/informed consent
- Evidence-based patient selection
- Multidisciplinary approach

Support group

- Meeting room
- Support office
- Research group or facilities

CT = computed tomography; ECG = electrocardiography; ED = emergency department; GI = gastrointestinal.

a BMI greater than 35 kg/m², or with a BMI of 30 kg/m² or more with 1 or more obesity-related comorbidities, such as complicated T2D, uncontrolled hypertension, sleep apnea or idiopathic intracranial hypertension. Patients who experience weight regain, adverse effects or medical complications following bariatric surgery are also eligible for a medical program. Ineligible patients are those with current drug or alcohol dependence; recent major cancer (life threatening and within the previous 2 years) undergoing active treatment in which caloric restriction might be contraindicated; untreated or inadequately treated psychiatric illness, or active and untreated eating disorder; current pregnancy; and those in whom fluid balance and electrolyte concerns may compromise care.

Programs and staff

The types of bariatric medicine programs offered can include lifestyle/behavioural change programs, meal replacement/behavioural change programs, and one-to-one programs with or without the use of pharmacologic intervention. They normally involve case management by a physician with expertise in bariatric medicine, or by a nurse practitioner with similar expertise and access to bariatric physicians for consultation. Additional human resources associated with bariatric medicine programs include the following.

- Registered dietician
- Social worker, behavioural specialist, or psychologist
- Kinesiologist or exercise physiologist with recognized provincial or federal qualification, physiotherapist, or occupational therapist
- Pharmacotherapy counselling as required
- Program/database manager

Components of the medical program

The medical program may require 1–2 years of commitment from patients. It should consist of an active phase program with 6 months of behaviour modifications along with nutritional and medical therapy and meal replacement, followed by a maintenance and consolidation phase of the treatment plan to provide support to the patient. Patients who experience weight regain during the maintenance phase may be offered a one-to-one intervention using a “toolbox” approach that includes partial meal replacement, pharmacotherapy and individual sessions with appropriate health care professionals.

In specific situations, patients’ participation in a medical weight loss program may be limited to once only. This applies to, for example, patients who have experienced weight regain after participation in a medical program or after weight loss surgery; patients for whom alternative treatment modalities are being considered; or patients who

require specific program accommodations (e.g., preoperative weight loss). The medical weight loss program should have a plan for transitioning patients back to their primary care provider within the community.

Medical program standardization

The minimal requirements for all programs include the following.

- Orientation
- First medical appointment
- Diagnostic testing and blood work
- Follow-up assessment

The formal orientation session occurs upon referral to the medical program. It includes both a clinic and program overview, and explanation of patient accountability. The first medical appointment involves an initial medical assessment by a physician or specialized nurse practitioner to assess the patient’s personal medical information, health history and other relevant information to determine their candidacy for the program. Diagnostic testing should be oriented by clinical examination and blood work performed to rule out associated diseases. More information is available in the Canadian guidelines for the management of obesity in adults.¹¹ Finally, patient follow-up supervision is mandatory during the active and maintenance/consolidation phases of the program, as clinically indicated and determined by each individual program (additional information on the assessment, preoperative evaluation and follow-up after bariatric surgery can be found in the clinical practice guideline for the management of obesity in adults developed by CABPS in collaboration with Obesity Canada.¹¹

Virtual care

As a result of the COVID-19 pandemic, most programs transitioned to virtual care to facilitate safe and effective care for participants. Virtual care is defined as “any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies, with the aim of facilitating or maximizing the quality and effectiveness of patient care.”¹⁸

BARIATRIC MEDICINE TRAINING PROGRAMS

Upon completion of training in bariatric medicine, the trainee is expected to be competent in the following skills.

- Practising weight-related history-taking and physical examination skills
- Understanding health risks and complications of obesity
- Identifying differential diagnoses of obesity
- Managing weight-related comorbidities, including diabetes, hypertension, sleep apnea, dyslipidemia, liver steatosis and steatohepatitis

- Implementing evidence-based principles of obesity treatment, including behavioural and medical interventions
- Knowing the indications for bariatric surgery and types of surgeries available, including laparoscopic RYGB, sleeve gastrectomy, duodenal switch and novel surgeries (endoscopic and single-anastomosis surgeries)
- Understanding the preoperative assessment of the bariatric surgical candidate, including cardiac/pulmonary risk assessment and bariatric surgery-specific risk assessment tools
- Understanding the postoperative course of the bariatric surgical patient
- Understanding physiologic changes secondary to bariatric surgery and success rates in terms of weight loss and resolution of comorbidities
- Managing the short/long-term complications of bariatric surgery, including nutritional deficiencies and postsurgical hypoglycemia

The topics that should be included as essential components in the curriculum of obesity medicine/surgery training programs are listed in Box 3.

DATA COLLECTION

Surgical programs

Collection of data for patients participating in a surgical program should include demographic data (age, sex, race and ethnicity, medical history, comorbidities); health behaviour (exercise, nutritional information); baseline characteristics (weight, height, BMI, waist and hip circumferences); perioperative data (surgical technique, operative time, perioperative complications); and short-term (90 d) and long-term (> 90 d) complications, graded according to an international classification system (e.g., Clavien–Dindo classification).

Long-term follow-up should be promoted after bariatric surgery, and should include weight loss, remission rate of comorbidities, changes in nutritional parameters and changes in quality of life.

Data should be entered in a local electronic database or at a provincial level and analyzed at least on an annual basis. These data should be reviewed by a bariatric coordinator, with feedback given to the individual surgeon.

Aggregated anonymized data should be sent annually to the Canadian Registry for quality control, and should include demographic data (mean age, sex ratio, percentage of patients with T2D, hypertension, dyslipidemia, sleep apnea); surgical volume (number and types of procedures, revisional or conversion surgery); 90-day complication rates (including leak, hemorrhage, deep vein thrombosis, pulmonary embolism); and readmission, reoperation and mortality rates.

Box 3. Topics that should be included as essential components in the curricula of obesity medicine/surgery training programs

Obesity

- Causes of obesity (genetic, behavioural, environmental, pharmacologic and endocrine)
- Complications of obesity (OSA, hypertension, heart disease, coronary artery disease, stroke, diabetes, liver steatosis, metabolic syndrome, PCOS, psychiatric illness)
- Obesity bias and stigma
- Nonpharmacologic treatment
 - Knowledge of nutritional medical therapy
 - Physical activity and exercise prescription
- Behavioural modification
 - Behavioural and cognitive therapies
 - Other therapies
- Pharmacologic risks (e.g., antidepressants, antipsychotics, diabetic medications, antihypertensive medications)
- Candidate selection for surgical treatment
 - Surgical procedures (sleeve gastrectomy, RYGB, duodenal switch and others)
 - Follow-up post-surgery (short- and long-term nutritional and surgical complications)

Diabetes

- Role of nutrition, exercise and pharmacological management
- Monitoring and prevention of complications
- Management of complications (e.g., retinopathy, nephropathy, neuropathy)

Bone health

- Disorders of calcium metabolism, including disorders of vitamin D and parathyroids
 - Osteopenia and osteoporosis, including prevention, diagnosis and management

Lipid disorders

- Diagnosis, management and monitoring of lipid disorders

Lifestyle (Health behaviours)

- Recommendations for a healthy lifestyle, including nutrition, physical activity and strategies to prevent overweight and diseases associated with obesity

Guidelines

- Appropriate follow-up and data collection after bariatric surgery and participation in medical programs

OSA = obstructive sleep apnea; PCOS = polycystic ovary syndrome; RYGB = Roux-en-Y gastric bypass.

National benchmarks should be drawn from the information provided and an annual report sent to individual centres to allow comparison to national means.

Medical programs

Collection of data for patients participating in a medical weight loss program may include weight loss (percentage of weight lost from baseline); improvement in comorbidities, such as T2D, hypertension (improvement in diastolic and systolic measures), dyslipidemia and sleep apnea; improvement in medications, including antihypertensive, antidiabetic, analgesic/narcotic, anti-inflammatory, antidepressant, and lipid-lowering agents; improvement in treatments, including CPAP pressure; improvement in metabolic profile, including fasting blood glucose, glycated hemoglobin (HbA_{1c}), liver function test, glomerular

filtration estimate, and lipid profile; changes in quality of life between baseline and program completion, including health-related (HR-QoL), weight-related (WR-QoL) and patient-related outcomes; and level of patient satisfaction at treatment completion.

CONCLUSION

The goal of this document is to guide the creation, development, and improvement of centres of expertise in bariatric surgery and medicine in Canada, through standardization of training, program requirements and recording of outcomes. Obesity is a complex, relapsing and multifactorial disease that has reached epidemic proportions, for which medical and surgical expertise is required. A multi-faceted approach and collaboration are necessary not only at a local level, but also at a national level. For this reason, it has become essential to establish minimal criteria for the creation or designation of such centres, developed by broad consensus among Canadian bariatric experts, and implementable within the existing health care system. These criteria may be used to develop Canadian accreditation by provincial governments or by CABPS.

Affiliations: CIUSSS du Nord-de-L'Île de Montréal, CIUSSS NIM (Garneau), Montréal, Que.; Humber River Hospital (Glazer), Toronto, Ont.; University Institute of Cardiology and Respiriology of Quebec (Biertho), Québec, Que.; Richmond General Hospital (Sampath), Richmond, B.C.; University Health Network (Jackson), Toronto, Ont.; Guelph General Hospital (Reed), Guelph, Ont.; McGill University (Christou), Montréal, Que.; the Department of Endocrinology and Metabolism, Western University (Shaban), London, Ont.; and the Regional Bariatric Assessment and Treatment Centre of Windsor (Shaban), Windsor, Ont.

Acknowledgements: The authors thank Melonie Hart, CABPS Director of Operation, and David Petrie, CABPS Project Manager, for their help coordinating and providing administrative support for the development of this document. The authors also acknowledge the contributions of Tony V. Chetty and Maria Tiboni from the Ontario Bariatric Network Medical and Surgical Task Force.

Competing interests: None declared.

Contributors: All authors contributed substantially to the conception, writing and revision of this article and approved the final version for publication.

Content licence: This is an Open Access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY-NC-ND 4.0) licence, which permits use, distribution and reproduction in any medium, provided that the original publication is properly cited, the use is noncommercial (i.e., research or educational use), and no modifications or adaptations are made. See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>

References

1. *Obesity in Canada. A joint report from the Public Health Agency of Canada and the Canadian Institute for Health Information.* Ottawa: Canadian Institute for Health Information; 2011. Available: https://secure.cihi.ca/free_products/Obesity_in_canada_2011_en.pdf (accessed 2019 July 1).
2. Katzmarzyk PT, Mason C. Prevalence of class I, II and III obesity in Canada. *CMAJ* 2006;174:156-7.
3. *Diabetes, 2017.* Ottawa: Statistics Canada; 2018. Available: <https://www150.statcan.gc.ca/n1/pub/82-625-x/2018001/article/54982-eng.htm> (accessed 2019 July 1).
4. Altieri MS, Pryor AD, Yang J, et al. Bariatric peri-operative outcomes are affected by annual procedure-specific surgeon volume. *Surg Endosc* 2020;34:2474-82.
5. Celio AC, Kasten KR, Brinkley J, et al. Effect of surgeon volume on sleeve gastrectomy outcomes. *Obes Surg* 2016;26:2700-4.
6. Hollenbeak CS, Rogers AM, Barrus B, et al. Surgical volume impacts bariatric surgery mortality: a case for centers of excellence. *Surgery* 2008;144:736-43.
7. NIH conference. Gastrointestinal surgery for severe obesity. Consensus Development Conference Panel. *Ann Intern Med* 1991;115:956-61.
8. *Standards Manual v2.0: Resources for optimal care of the metabolic and bariatric surgery patient.* American College of Surgeons and American Society for Metabolic and Bariatric Surgery; 2016. Available: <https://www.facs.org/-/media/files/quality-programs/bariatric/mbsaqip-standardsmanual.ashx> (accessed 2019 July 1).
9. American Board of Obesity Medicine. *Policies and procedures.* ABOM; 2020. Available: www.abom.org (accessed 2020 Aug. 1).
10. Mechanick JI, Apovian C, Brethauer S, et al. Clinical practice guidelines for the perioperative nutrition, metabolic and nonsurgical support of patients undergoing bariatric procedures – 2019 update. *Endocr Pract* 2019;25:1346-59.
11. Wharton S, Lau D, Vallis M, et al. Obesity in adults: a clinical practice guideline. *CMAJ* 2020;192:E875-91.
12. Froylich D, Abramovich-Segal T, Pascal G, et al. Long-term (over 10 years) retrospective follow-up of laparoscopic adjustable gastric banding. *Obes Surg* 2018;28:976-80.
13. Ball W, Raza S, Loy J, et al. Effectiveness of intra-gastric balloon as a bridge to definitive surgery in super obese. *Obes Surg* 2019;29:1932-6.
14. *Core Curriculum for American Society for Metabolic and Bariatric Surgery Fellowship Training Requirements.* Florida: American Society for Metabolic and Bariatric Surgery; 2022. Available: <https://asmbs.org/app/uploads/2014/05/CoreCurriculumASMBSFellowshipTraining.pdf> (accessed 2019 Aug. 1).
15. Garneau P, Ahmad K, Carignan S, et al. Preceptorship and proctorship as an effective way to learn laparoscopic sleeve gastrectomy. *Obes Surg* 2014;24:2021-4.
16. *Trauma center levels explained: designation vs. verification.* Virginia: American Trauma Society; 2016. Available: <https://www.amtrauma.org/page/traumalevels> (accessed 2019 July 1).
17. Garofalo F, Denis R, Abouzahr O, et al. Fully ambulatory laparoscopic sleeve gastrectomy: 328 consecutive patients in a single tertiary bariatric center. *Obes Surg* 2016;26:1429-35.
18. *Virtual care, recommendations for scaling up virtual medical services, Report of the virtual care task force.* Ottawa: Canadian Medical Association; 2020. Available: <https://www.cma.ca/virtual-care-recommendations-scaling-virtual-medical-services> (accessed 2020 July 1).