



# Obesity, Weight Loss, and Low Back Pain: An Overview for Primary Care Providers—Part 2

### ABSTRACT

Obesity and low back pain are equally complex medical conditions with multi-factorial etiologies. Their clinical practice guidelines both include recommendations for screening and examination that can be easily implemented. There is sufficient information to compile a framework for the primary care provider, partnering with the patient and appropriate specialists, to manage obesity and low back pain in a structured fashion. Weight loss and exercise are paramount and should be recommended as the first options. Cognitive behavioural therapy, pharmacological treatment and bariatric surgery may then be implemented sequentially depending upon the effectiveness of the initial interventions.

**KEYWORDS:** Obesity, low back pain, exercise, nutrition, cognitive behavioural therapy, bariatric surgery, weight loss, pharmacological, evidence-based guideline



CME

Pre-test Quiz



### Editor's comment:

This is the second part in a review of obesity and low back pain by Dr. Roffey and his co-authors. The importance of the subject and the depth of information warrant extended coverage in Back Health. Part 1 addressed the possible causes, interactions and relevance. This section offers detailed but highly practical treatment strategies with specific recommendations for primary care providers.

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## Review of Evidence-Based Recommendations to Treat Obesity for Patients with LBP

None of the most recent evidenced-based guidelines for treating obesity<sup>1-4</sup> recommend weight loss options specifically for those with low back pain (LBP). However, the Australian Clinical Practice Guidelines for the Management of Overweight and Obesity<sup>3</sup> recognize the importance, suggesting that weight loss of 5% or more adults with musculoskeletal problems may improve symptoms. Of note, examination of evidence-based guidelines for obesity<sup>1-4</sup> and LBP<sup>5-9</sup> reveals many distinct similarities and commonalities (Table 1).

Based on this examination of the guidelines<sup>1-9</sup> there is evidence for four specific intervention options to help obese LBP patients lose weight. The short and long term success rates of these four options vary widely and the evidence for these interventions varies from sparse (i.e. case report, expert consensus) to high grade (i.e. high quality randomized controlled trials):

1. Lifestyle change (Exercise / Nutrition)
2. Cognitive Behavioural Therapy
3. Pharmacological treatment
4. Bariatric surgery (Gastric Bypass, Gastric Banding, or Sleeve Gastrectomy)

**Table 1: Summary of Evidence-Based Guideline Recommendations for Management of Obesity and Chronic LBP**

Obesity <sup>1-4</sup>	Chronic Low Back Pain <sup>5-9</sup>
1. Screen and identify obese patients	
2. Determine willingness to lose weight	
3. Screen for underlying serious condition (e.g. eating disorders)	Screen for underlying serious condition (i.e. red flags)
4. Screen and treat depression / anxiety	Screen and treat depression / anxiety
5. Lifestyle change (i.e. exercise / nutrition)	Exercise
6. Cognitive Behavioural Therapy	Cognitive Behavioural Therapy
7.	Massage therapy, spinal manipulation and/or acupuncture
8. Appropriate medications (as a tertiary intervention)	Appropriate medications
9. Surgical treatment for select patients (as a tertiary intervention)	Surgical / interventional therapy treatment for select patients (as a tertiary intervention)
10. Multidisciplinary approach (combination(s) of the above)	Multidisciplinary approach (combination(s) of the above)



### *Lifestyle Change*

Most clinicians know that musculoskeletal strength, endurance and flexibility are essential to metabolic and musculoskeletal health. They maintain or improve

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TO DATE, THE LACK OF GUIDANCE AS TO WHAT EXERCISE SHOULD BE PRESCRIBED FOR THE OBESE PATIENT WITH LBP HAS BEEN SEEN AS A BARRIER TO IMPLEMENTATION—BUT THIS SHOULD NOT DETRACT FROM THE IMPORTANCE OF GETTING THE PATIENT TO EXERCISE IN WHATEVER WAY POSSIBLE.

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bone density, increase functional status and aid the performance of the activities of daily living. There is an abundance of evidence on the benefits of activity and exercise,<sup>3</sup> and a recent study suggests that a combination of aerobic and resistance training is more effective than either one in isolation.<sup>10</sup> Regardless of modalities employed, regular exercise is also vitally important for long term maintenance of weight loss.<sup>11</sup> Canadian guidelines suggest initially 30 minutes of moderate intensity exercise 3-5 times per week and gradually progressing to 60 minutes with the addition of endurance exercise training.<sup>4</sup>

Evidence-based guidelines for LBP are vague on the most

appropriate type of exercise; a recent systematic review of the literature on this topic suggests that any type of exercise is beneficial.<sup>12</sup> Regardless of the type of exercise, gradual implementation is essential<sup>6,13</sup> to help maximize uptake and to maintain the exercise program as a lifestyle change.

To date, the lack of guidance as to what exercise should be prescribed for the obese patient with LBP has been seen as a barrier to implementation—but this should not detract from the importance of getting the patient to exercise in whatever way possible. Often patients with LBP report a directional component of their pain.<sup>14</sup> For example, “discogenic” pain is exacerbated by flexion activities such as sitting or lifting, whereas “facet-mediated” pain is exacerbated by extension activities such as reaching, standing and walking. Thus patients with a directional component to their pain can be guided towards activities that are less likely to worsen their symptoms (e.g. walking for those with flexion mediated pain; stationary cycling or walking on an inclined treadmill for those with extension mediated pain). Aquafitness is an excellent form of exercise that can offload the stress on the body regardless of directionality of pain.<sup>6</sup> Yoga is another exercise in which all patients can participate and which is supported



# Obesity and Low Back Pain: Intervention Options to Aid Weight Loss



**1 Lifestyle  
Changes**

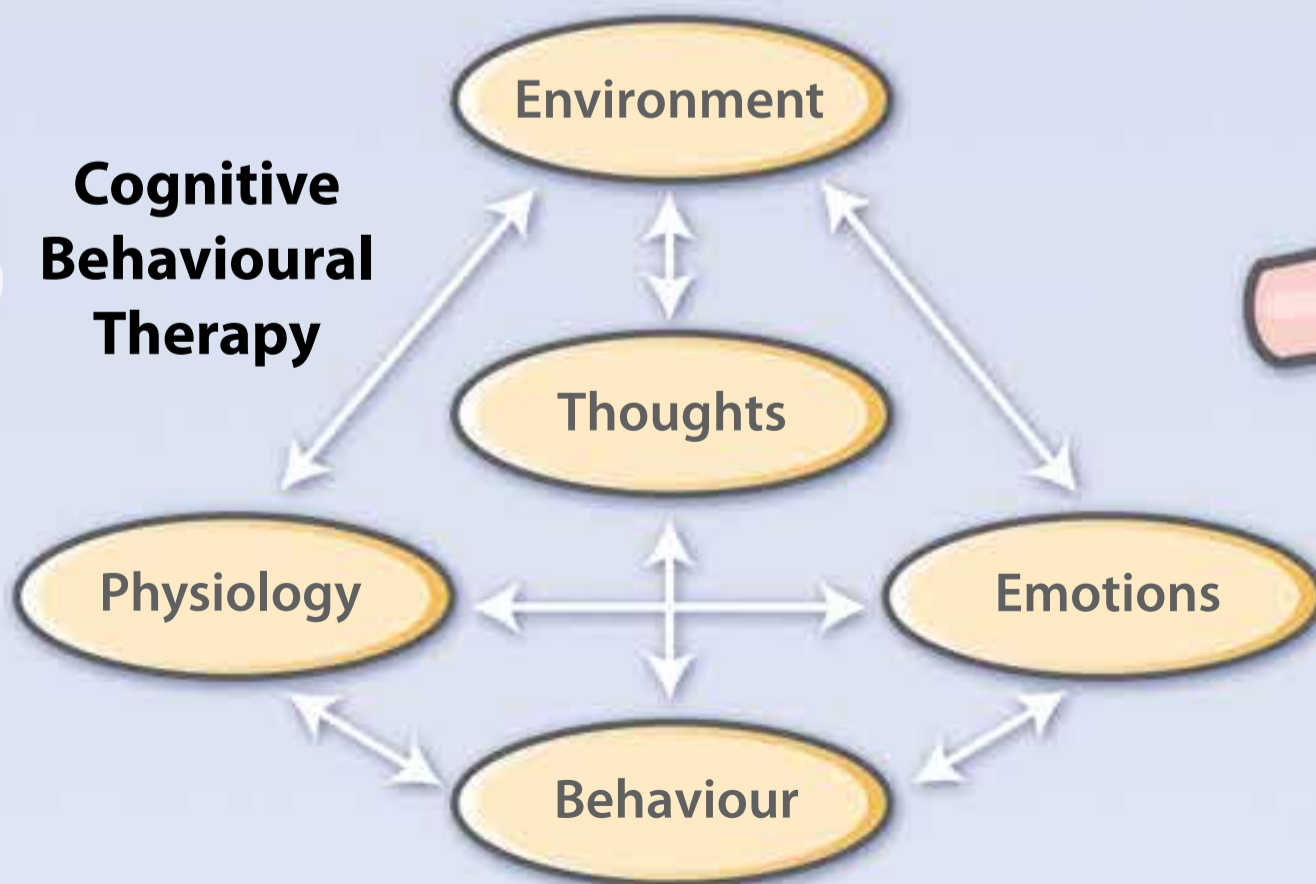


**2 Pharmacological  
Treatment**



**4 Bariatric  
Surgery**

**3 Cognitive  
Behavioural  
Therapy**



by evidenced-based guidelines.<sup>6,8</sup> Anecdotally, patients should be counselled to advise yoga instructors of their LBP, so that appropriate customization of poses can be taught. To date, pilot rand-

to modest weight loss.<sup>19</sup> Viewed from a patho-mechanism perspective, a reduction of the degree of systematic inflammation through exercise and weight loss may allow obese patients to control or even reduce their LBP.

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## WEIGHT LOSS AND EXERCISE ARE PARAMOUNT AND SHOULD BE RECOMMENDED AS THE FIRST TREATMENT OPTIONS.

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omized controlled trials assessing yoga<sup>15</sup> and aqua-fitness for weight loss<sup>16</sup> have produced encouraging results.

Very low calorie dietary programs typically contain less than 800 kcal per day.<sup>17</sup> This substantial caloric restriction approach generally results in 15-25% weight reduction in approximately 3-6 months. Unfortunately, the compliance with such radical nutrition routines is difficult, and as a consequence, long-term results are only modest (i.e. 9% weight reduction after 1 year, and 5% after 4 years).<sup>17</sup> Compliance to extreme lifestyle change is difficult. Only truly determined and dedicated patients persist. In addition, musculoskeletal issues such as LBP often prevent the completion of daily exercises.<sup>18</sup> Lack of sustained motivation and co-morbidities are but two reasons why intensive programs of lifestyle change lead only

### *Cognitive Behavioural Therapy*

Cognitive behavioural therapy (CBT) is a psychological intervention usually administered by trained practitioners such as psychologists or psychiatrists. The two major forms of CBT are: 1) stress management and; 2) addressing abnormal thought processes to modify pathological behaviour. Stress management can be beneficial in the treatment of LBP and obesity, helping to mitigate many excess-weight associated risks.<sup>20</sup> In an obese patient, behavioural modification methodology focuses on self-monitoring, goal setting and modifying specific eating behaviours.<sup>6</sup> The first two strategies, self-monitoring and goal-setting, are equally beneficial when trying to implement an exercise program for LBP.

### *Pharmacological Treatment*

Pharmacological treatment of obesity is an evolving area.<sup>21-24</sup> Unfortunately, no studies of this approach have focused on the association between obesity and LBP. In general, pharmacological treatment may generate additional weight loss of 5 kg in the first year. Longer-term data on continued



weight loss, cardiovascular events, effect on diabetes or unanticipated side effects are lacking.

### **Bariatric Surgery**

In contrast to the compliance issues of lifestyle change and lack

effective long-term treatment for obesity. Although there are some case-series that demonstrate improvements in LBP following bariatric surgery, this is far from the evidence-based guidelines necessary to recommend this intervention as a treatment for LBP.

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## THE ROLE OF SPINAL FUSION FOR LBP REMAINS REMARKABLY CONTROVERSIAL AND THIS AMBIVALENCE INCREASES EXPONENTIALLY WHEN SURGERY IS CONSIDERED FOR AN OBESE PATIENT.

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of data on pharmacological intervention, the evidence suggests that surgical treatment of obesity may lead to more sustained weight loss.<sup>25</sup> Average weight loss in the vicinity of 26 kg and a reduction in body mass index (BMI) of up to 12 kg/m<sup>2</sup> have been observed following bariatric surgery.<sup>26,27</sup> For those with LBP, recent studies have illustrated that bariatric surgery helped reduce LBP,<sup>28</sup> as measured by Numeric Pain Rating,<sup>29</sup> Visual Analogue Scale<sup>30</sup> and Quality of Life.<sup>31</sup> The evidence suggests that bariatric surgery results in sustained weight loss and a decrease in concomitant disease rates and mortality.<sup>32,33</sup> However, there are strict indications, significant complications and potential harm associated with all the procedures.<sup>19,34-38</sup>

Overall, the evidence suggests that bariatric surgery is the most

### **Obesity and Spine Surgery Outcomes**

The impact of obesity on surgical intervention for lumbar degenerative disease is not benign. With advances in both anaesthesia and surgical technique, spinal fusions are now being undertaken in patients ranging from young and healthy, to elderly and frail, and from normal weight to morbidly obese. The role of spinal fusion for LBP remains remarkably controversial and this ambivalence increases exponentially when surgery is considered for an obese patient. The procedure often involves larger incisions and more extensive soft-tissue dissection with more procedural difficulty because of reduced visibility and instrument approach angles. These operative complications are one reason why minimally invasive surgery, which is essentially unaffected by the depth of the wound, is gaining popularity for the obese patient.

Desirable post-surgical improvements in neurological and quality of life outcomes are achievable, in both those with normal body habitus and in obese patients. In a retrospective cohort analysis, Djurasovic *et al.*,<sup>39</sup> describe 270 patients managed



with lumbar spinal fusion, revealing similar improvement in SF-36 Health Survey and Oswestry Disability Index outcomes in both normal and obese BMI groups postopera-

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## SUFFICIENT INFORMATION EXISTS TO COMPILE A FRAMEWORK FOR THE PRIMARY CARE PROVIDER TO PARTNER WITH THE PATIENT AND WORK TOWARDS MANAGEMENT OF THEIR OBESITY AND LBP IN A STRUCTURED FASHION.

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tively; although better overall scores at 2-year follow-up were observed in the normal BMI group. Complication rates were higher in the obese BMI group, primarily driven by wound-complications.<sup>39</sup> Similar findings are reported in all age groups, with Gepstein *et al.*,<sup>40</sup> describing a decade experience of 298 normal and obese elderly patients (over 65 years of age) where similar postoperative improvement was observed among treatment groups. Further, Rosen *et al.*,<sup>41</sup> report a cohort of 110 patients undergoing minimally invasive trans-foraminal lumbar interbody fusions with stable SF-36 Health Survey outcomes across different BMIs, suggesting that obesity is not an absolute contraindication to fusion surgery.

Nevertheless, more rigorous analysis of 2,633 patients in the Swedish Spine Register reveals that,

despite exhibiting significant pain reduction and improved quality of life assessed by the Oswestry Disability Index and EuroQol 5-Dimension scores, the obese patients exhibited lesser improvements than normal BMI patients accompanied by higher degrees of dissatisfaction.<sup>42</sup> Among spinal fusion patients, early reoperation occurs more frequently in the obese population (odds ratio 1.73), although this may be because of a greater need for deformity correction.<sup>43</sup>

The perioperative experience for the obese patient is also of concern. Shamji *et al.*,<sup>44</sup> undertook to assess nationwide complications, charges, and disposition of lumbar fusion patients stratified by body habitus, studying over 240,000 patients over 16 years. While mortality among the various groups remained comparable, transfusion requirement, cauda equina syndrome, length of stay, cost of hospitalization, and discharge to assisted care was markedly elevated among obese patients. These results were further confirmed by a recent meta-analysis<sup>45</sup> compiling experience of 97,000 patients where perioperative complications, including revision spinal surgery, were more common in the obese subgroup. Olsen *et al.*,<sup>46</sup> define a five-fold increase in the incidence of surgical site infections among morbidly obese patients undergoing spinal surgery. Meralgia paresthetica





## SUMMARY OF KEY POINTS

Mild-to-moderate weight loss in obese adults may help improve musculoskeletal symptoms.

Patients with a directional component to their low back pain can be guided towards physical activities that are less likely to worsen their symptoms (e.g. walking for flexion mediated pain; stationary cycling or walking on an inclined treadmill for extension mediated pain).

Four specific interventions available to help patients lose weight are (in order of implementation): lifestyle change, cognitive behavioural therapy, pharmacological treatment and bariatric surgery.

Despite a lack of guidance with respect to exercise prescription in the obese patient with low back pain, it is important to emphasize that any type of exercise—including water-based therapeutic activities—is beneficial.

also occurs more frequently in the obese population, with an odds ratio of 1.8 compared with normal weight spinal surgery patients.<sup>47,48</sup>

Counselling the obese patient about surgery must be balanced. Reasonable success for neurological recovery and quality of life is achievable albeit with higher risk of perioperative and postoperative complications. This skew in the risk to benefit ratio must direct the surgeon and inform the patient.

### **Guidelines for the Primary Care Management of the Obese Patient with LBP**

It can be a challenge for the primary care provider to bring up the subject of weight control even with patients at risk for adverse health events because of obesity. An episode of LBP can present an opportunity to discuss potentially modifiable risk factors including weight loss.

Many implementation barriers exist. These include: lack of access and long waits for multidisciplinary clinics and specialists; poor access and inadequate funding for non-physician care providers (i.e. dietitians, psychologists, and exercise physiologists); and inadequate time required to counsel and educate the patient.<sup>4,6</sup> Nonetheless, there is sufficient information to compile a framework for the primary care provider to partner with the patient and work towards management of their obesity and LBP in a structured fashion.

As shown in Table 1, the first four evidence-based guideline recommendations: screen for obesity; determine willingness to lose weight; screen for serious underlying conditions and screen for depression/anxiety, are within the usual scope of practice. For the next two, lifestyle interventions and CBT the primary care







## CLINICAL PEARLS

Screening and examination recommendations for obese and low back pain patients are similar and within the scope of care of a primary care provider.

An episode of low back pain in an obese patient can present as an opportunity to discuss modifiable risk-factors such as weight loss (and overall lifestyle modification).

role is to initiate, coordinate, motivate, educate and monitor; the interventions themselves are best administered by the appropriate specialists such as exercise physiologists, physiotherapists, dieticians and psychologists.<sup>4</sup> Although, unfortunately, these specialists are currently not funded by many provincial health insurance plans there are numerous Canadian agencies such as the Canadian Society for Exercise Physiology ([www.csep.ca](http://www.csep.ca)), Exercise is Medicine Canada ([www.exerciseismedicine.ca](http://www.exerciseismedicine.ca)), Canadian Diabetes Association ([www.diabetes.ca](http://www.diabetes.ca)) and Canadian Obesity Network ([www.obesitynetwork.ca](http://www.obesitynetwork.ca)) that provide educational resources for physicians and patients to help facilitate lifestyle changes. The remaining recommendations regarding complementary and alternative therapies such as massage therapy, spinal manipulation or acupuncture, appropriate medications for weight loss and surgical/interventional therapy treatment options for select

patients all require extensive patient counselling and frequently referral to specialists or qualified providers within the field.

A good place for the primary care provider to start addressing weight loss in obese patients with LBP is the Canadian Obesity Network 5As of Obesity Management<sup>TM</sup>.<sup>49</sup>

- ASK for permission to discuss weight and explore readiness for change
- ASSESS obesity related health risk and potential “root causes” of weight gain
- ADVISE on obesity risks, and discuss benefits of treatment options
- AGREE on realistic weight-loss expectations and on a smart plan to help achieve behavioral goals
- ASSIST in addressing weight gain drivers and barriers to change, offer education and resources, refer to qualified providers, and arrange follow-up

Appendix I summarizes the 5As of Obesity Management<sup>TM</sup>.<sup>49</sup>



## Appendix I: Canadian Obesity Network: 5As of Obesity Management™49

**ASK** for permission to discuss weight and explore readiness for change. Weight is a sensitive issue. Many patients are embarrassed or fear blame and stigma. An empathetic approach is required. Be non-judgmental, explore readiness to change, and use motivational interviewing techniques

**ASSESS** obesity related health risk and potential “root causes” of weight gain

- Assess obesity class and stage.
  - i. Measure BMI
  - ii. Measure Waist Circumference if BMI is >25 and <35
- o Determine Obesity Class based on BMI, Waist Circumference and Obesity Stages based on co-morbidities and end organ damage.
- o Table I: Obesity Class
- o Table II: Edmonton Obesity Staging System
- Assess for Obesity Drivers, Complications and Barriers:
  - iii. Mental: Cognition, Depression, Attention Deficit, Psychosis, Eating Disorder, Trauma, Insomnia
  - iv. Mechanical: Sleep Apnea, Osteoarthritis, Chronic Pain, Reflux Disease, Incontinence, Thrombosis, Intertrigo, Plantar Fasciitis
  - v. Metabolic: Type 2 Diabetes, Dyslipidemia, Hypertension, Gout, Fatty Liver, Gallstones, Poly Cystic Ovarian Syndrome, Cancer
  - vi. Monetary: Education, Employment, Income, Disability, Insurance, Benefits, Bariatric Supplies, Weight-Loss Programs  
Measure blood pressure, heart rate, fasting glucose, lipid profile. Screen for depression, eating and mood disorders.
- Assess for Root Causes of weight gain:
  - vii. Slow Metabolism
    - 1. The use of Tricyclic Antidepressants and other medications commonly used for chronic Low Back Pain and Neuropathic pain is often complicated by weight gain.
  - viii. Increased Food Intake
  - ix. Reduced Activity
    - 1. Patients not uncommonly restrict or pace activity as a management strategy for low back pain.
    - 2. The use of medication to treat low back pain can lead to relative inactivity. This can be anticipated as a side effect with both anti-depressant and anti-epileptic medications that may be used as well as muscle relaxants, particularly benzodiazepines.

**Table I: Obesity Class and Waist Circumference**

BMI	kg/m <sup>2</sup>
Underweight	≤18.5
Normal Weight	18.6-24.9
Overweight	25.0-29.9
Obesity Class I	30.0-34.9
Obesity Class II	35.0-39.9
Obesity Class III	≥40
Waist Circumference Risk Threshold: Europid: Male ≥94cm, Female ≥80cm Asian and Hispanic: Male ≥90cm, Female ≥80cm	

**Table II: Edmonton Obesity Staging System**

Stage 4: End Stage
Stage 3: End-Organ Damage
Stage 2: Established Co-Morbidity
Stage 1: Preclinical Risk Factors
Stage 0: No Apparent Risk Factors



## Appendix I continued: Canadian Obesity Network: 5As of Obesity Management<sup>TM49</sup>

### **ADVISE** on obesity risks, and discuss benefits of treatment options

- Explain benefits of modest weight loss as a factor that may decrease the risk of recurrent episodes of low back pain, and the need for a long term strategy and treatment options for weight control instead of a temporary problem.
- The patient needs to understand that a realistic goal of sustainable weight loss with behavioural intervention alone is about 3-5% of initial weight. Important elements include:
  - i. Sleep, time and stress management
  - ii. Dietary interventions: eating pattern, nutrition and portion size.
  - iii. Discourage fad diets
  - iv. Physical Activity
    1. Any time of physical activity can be recommended for the long term management of low back pain, however a consultation with a knowledgeable expert may be necessary to develop more specific recommendations if a pattern of increased pain with certain types of exercise are evident.
  - v. More intensive psychological interventions with a mental health therapist may be required to address issues of: self esteem, emotional eating, and alternative coping strategies. Cognitive Behavioral Therapy can be a valuable treatment modality.
- If a greater degree of weight loss is required, Low Calorie Diets (medically supervised) and meal replacements may be indicated.
  - o The objective is to reduce energy intake by 500 to 1,000 kcal/day
- Anti-Obesity Medications can help patients achieve and sustain 5-10% weight loss, however, this is generally regained on discontinuation of the medication.
  - I. Consider if BMI >27 accompanied by risk factors, or BMI >30 alone.
  - II. Consider as an adjunct if patient has not lost 0.5 kg/week by 3 to 6 months with lifestyle changes alone.
  - III. At the time of this writing, Orlistat is the only medication currently available in Canada that is marketed for obesity management.
- Bariatric Surgery
  - I. Consider for all patients requiring more than a 15% sustainable weight loss for the prevention and management of obesity related complications.
  - II. Consider if BMI >35 in the presence of risk factors or BMI >40 alone. Also consider when other less invasive weight loss attempts have failed.
  - III. Requires multidisciplinary presurgical assessment and long-term medical, nutritional and psychosocial support



## Appendix I continued: Canadian Obesity Network: 5As of Obesity Management™<sup>49</sup>

**AGREE** on realistic weight-loss expectations and on a SMART plan to help achieve behavioral goals.

- Unrealistic expectations can lead to disappointment and non-adherence.
  - o A reasonable target with behavioural and medical interventions is 0.5 to 1.0 kg/week for a total of 5 to 10% of initial weight (approx. 6 months), after which a plateau is generally reached.
  - o For some, prevention or slowing of weight gain may be the only realistic target
- Address Drivers of weight gain:
  - o Stress, time pressures, sleep apnea, depression, chronic pain including low back pain will need to be managed before the patient can be expected to be successful with behavioural modifications.
  - o Focus on sustainable behavioural changes rather than specific target weights using SMART goals:
    - Specific
    - Measurable
    - Achievable
    - Rewarding
    - Timely

For example, an exercise prescription of thirty minutes of moderate intensity exercise 3-5 times per week, eventually increasing to one hour or more on most days.

- The use of a journal can help the patient to initiate and sustain behavior changes, and to identify activities, thoughts, and emotions that may be associated with their low back pain.

**ASSIST** in addressing weight gain drivers and barriers to change, offer education and resources, refer to qualified providers, and arrange follow-up

- Concurrent medications may make management difficult and weight gain is a side effect of many commonly used medications used in the treatment of low back pain, particularly if chronic.
- Help patients identify credible sources of information and resources for weight management. The on-line resources of the Canadian Obesity Network are an excellent source of validated information:
  - i. [www.obesitynetwork.ca](http://www.obesitynetwork.ca)
- Appropriate providers in an interdisciplinary team will depend on the Drivers and Complications identified as well as Barriers to weight management. With co-existent low back pain, an interdisciplinary team may include mental health as well as physical rehabilitation providers.
- Long Term follow up is essential to address relapses, success is directly related to frequency of provider contact. Relapse should be framed as a natural and expected consequence of dealing with a chronic condition.



tailored to Canadian primary care providers.

### Concluding Remarks

While there is an association between obesity and LBP, the exact nature of this relationship is not as simple as previously believed and may involve more than the physical forces of an increased upper body mass exerted on lumbar intervertebral discs. While research will continue to investigate the nature of the relationship between obesity and LBP, the current ambiguity is not a reason to avoid taking action. Even in the absence of a clearly elucidated mechanism linking obesity and LBP, the detrimental impact of obesity on a variety of health conditions and the beneficial effects of increasing physical activity make it prudent for physicians evaluating overweight patients with LBP to recommend weight loss and exercise.

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CME

## Post-test Quiz

Members of the College of Family Physicians of Canada may claim MAINPRO-M2 Credits for this unaccredited educational program.

- Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care. *Can Fam Physician*, 2013; 59(1): 27-31.
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