

Bariatric Surgery Handbook

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Welcome to the Victoria Bariatric Program!

Electing to have bariatric surgery is a big decision that is often both scary and exciting for patients. We have created this manual to help guide you through the process leading up to your surgery as well as to help you understand what you can expect during and after your surgery. The purpose of this manual is to provide you with resources and references which can be used throughout all stages of this process from the day you decide to have surgery to the many years following the surgery.

Bariatric surgery can be truly life changing. However, it does not come without its challenges including a long term commitment to changes in nutrition and exercise. We are thrilled to be your health care team to help support you through this process and encourage you to contact us with any questions or concerns before or after surgery.

Sincerely,

Your Health Care Team

Frequently Asked Questions: What can I expect from surgery?

How much weight will I lose?

Weight loss will vary from patient to patient. However, on average the rate of weight loss is between 1 and 2 pounds (0.5 to 1kg) per week. Weight loss usually continues between 12 and 18 months following surgery and is expected to be approximately 70-75% of excess weight for both sleeve gastrectomy and gastric bypass. It is important to note that losing weight too quickly can put you at risk for muscle loss, hair loss and vitamin deficiencies. During the first 18 months, many patients express concern when they do not see their weight decreasing for a few weeks in a row. Keep in mind that your body must adjust to it's "new normal" so be sure to continue to follow your exercise and nutritional guidelines during these times.

It is normal to have some weight regain once you reach your lowest weight following surgery. For most patients their weight will stabilize approximately 10% higher than their lowest post-surgery weight.

Is weight loss permanent?

Bariatric surgery is a life-changing tool for patients when it comes to weight loss. For 70-80% of patients, the majority of their weight loss is maintained for more than 5 years. However, a portion of patients may regain weight. It is important to remember that without longstanding lifestyle changes, weight loss may not remain permanent long term. However, when longstanding lifestyle changes are maintained including both healthy eating and exercise on a regular basis, weight loss can be maintained by the majority of patients.

How long is the recovery following surgery?

Recovery varies from patient to patient. However, both the sleeve gastrectomy and the gastric bypass have relatively quick recovery times. Most patients will be in hospital between 1 and 3 days following surgery. Return to work times also vary depending on the nature of the work, for example, people who work desk jobs may be able to return much sooner than those in jobs which involve physical labour or professional driving. These times vary from 2 weeks to 4 weeks. Heavy lifting (objects greater than 10 pounds) should be avoided for 6 weeks following surgery to allow ample time for your incision to heal. In the days and weeks immediately following surgery it is important to start low impact exercise such as short, slow walks to encourage healing as well as to help prevent the development of blood clots or pneumonia.

What kind of support will I receive leading up to surgery?

During the weeks and months leading up to surgery you will meet with a multi-disciplinary team that may include surgeons, anesthesiologists, internists, nurses, dietitians, psychiatrists, occupational therapists, respirologists and respiratory therapists. This health care team will help to determine if the surgery is the right option for you as well as help you to begin to make lifestyle changes leading up to the surgery. Beginning to engage in lifestyle change before surgery will allow you time to slowly incorporate healthy strategies into your everyday life so that you will be fully prepared for the changes that come after the surgery that will help to ensure that the surgery is a success. Your health care team should be seen as a support network that is there to help you navigate the ups and downs of this process, to troubleshoot the challenges with you and most importantly to help you achieve your health and weight loss goals!

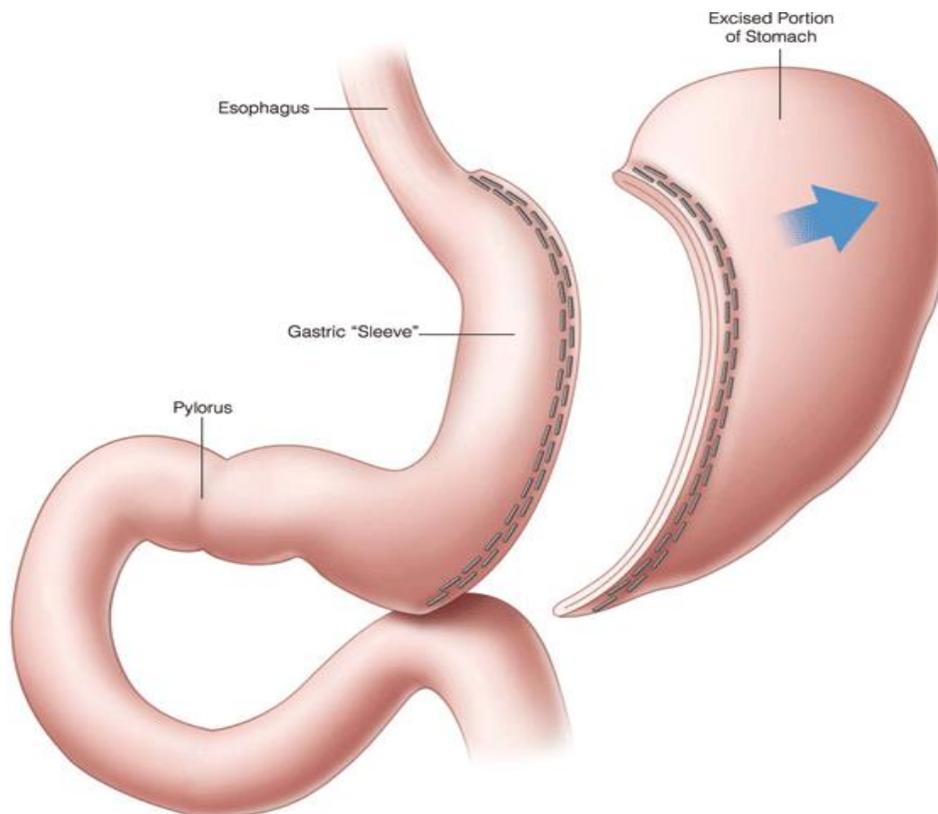
What can I do to help prepare myself for surgery?

- Keep a food diary. You can use My Fitness Pal if available (please see the section on “Keeping a Food Diary” for more details). You will meet with a dietitian for specific instructions on diet. Having access to your food diary is an essential part of helping you prepare for surgery.
- 30 minutes a day of exercise or sustained activity including walking.
- Bloodwork or any tests such as sleep studies and GI screening ordered by your health care team.
- Smoke-free for 6 months.
- Cut out alcohol and fizzy/carbonated drinks.
- Using your CPAP consistently and providing compliance data from your CPAP machine (if applicable).
- Limiting use of NSAIDS (non-steroidal anti-inflammatory medications) such as Ibuprofen, Advil, Motrin, Aleve, Naprosyn, Naproxen, Aspirin (ASA) due to the increased risk of ulcers and bleeding post-surgery. If chronic pain is an issue, please discuss this with your health care team to determine alternative treatments.
- Limiting time released medications and those to treat osteoporosis (such as Fosamax). Ask your surgeon for more details.
- Avoid herbal supplements unless approved by your health care team.

Types of Bariatric Surgery

Laparoscopic Sleeve Gastrectomy

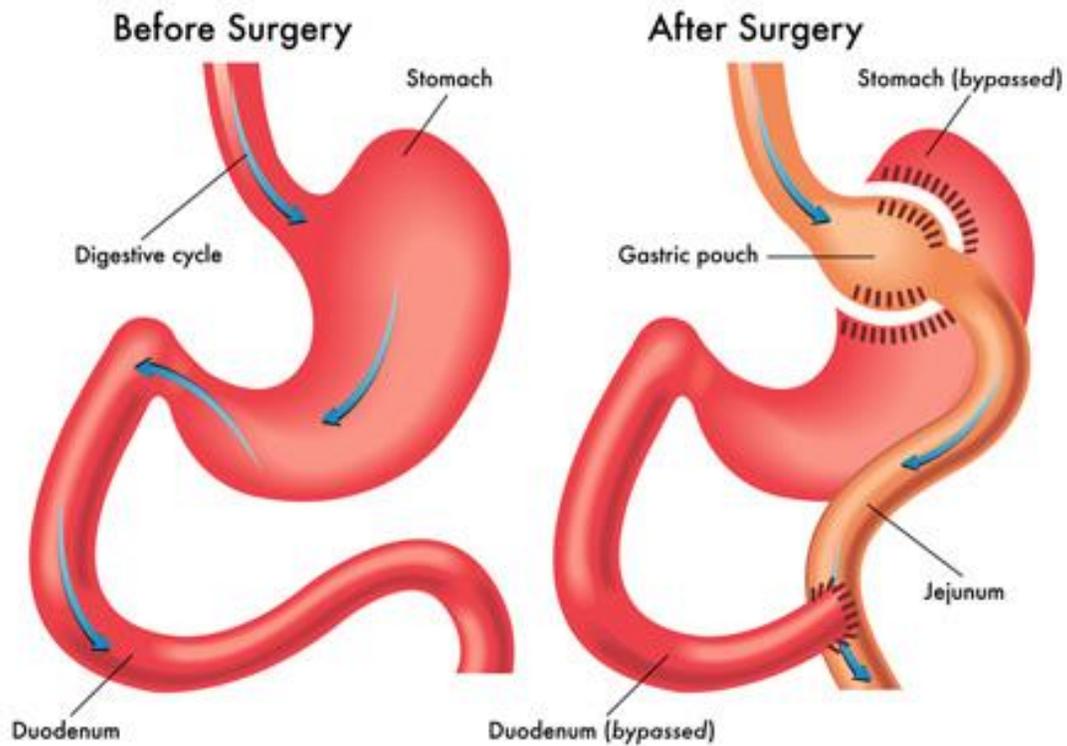
This surgery is the most common surgery performed. It involves small cuts into your abdomen to allow the surgeon access to your stomach. 75-85% of your stomach is then removed. Your new stomach will resemble the shape of a banana and will hold approximately 100ml of food or drink. This surgery not only physically makes your stomach smaller, it also removes 75-85% of the hunger hormones produced in your stomach from circulation.



http://www.weightlossmichigan.com/procedures/laparoscopic_sleeve_gastrectomy

Laparoscopic Roux-En-Y Gastric Bypass

This surgery is laparoscopic and involves dividing your small intestine and reattaching it to a small pouch created using the top part of your stomach. This means that part of your small intestine is bypassed and your stomach is now only the size of an egg. This procedure not only creates a very small space for food in the stomach it also reduces the amount of food and nutrients that you are absorbing due to the bypass of part of the small intestine.



<http://bariatrics.ucla.edu/body.cfm?id=92>

Obstructive Sleep Apnea (OSA)

Obstructive Sleep Apnea (OSA) is a serious breathing disorder which occurs during sleep. People with OSA stop breathing, sometimes frequently, during the night. It is estimated that 55-90% of people with obesity have some form of OSA (some cases are more severe than others), however, if left untreated OSA can lead to long term complications such as high blood pressure, heart attack, heart failure, diabetes, weight gain, depression and stroke.

For those with obesity, obstructive sleep apnea can be caused by excess fat tissue which can cause narrowing of the throat or upper airway. This results in a drop in air flow when sleeping because of the relaxed airway muscles and tissues surrounding the throat. This can cause a decrease in oxygen level which disrupts sleep. Even if the person does not actually wake up during these periods, the disrupted sleep can leave the patient feeling exhausted with a headache and dry throat in the morning. OSA can also cause daytime sleepiness which can also put people at risk for injury, for example, if sleepy when driving or operating heavy machinery.

All patients wishing to have bariatric surgery must be screened for OSA. This test will be arranged by your health care team. Most patients will have a simple overnight screening test done using a machine in their own home.

If you are found to have OSA, the best treatment is usually a CPAP (Continuous Positive Airway Pressure) machine which is worn when sleeping. This machine will help to keep the airway open and therefore help to prevent snoring and the decreases in airflow and oxygen during the night. Having untreated sleep apnea following surgery can greatly affect weight loss so it is critical that treatment be pursued if you are found to have sleep apnea.

However, as you lose weight following surgery, you will be monitored for improvements in OSA which may result in changes to your CPAP machine. A repeat sleep study will be performed 12-18 months after surgery to investigate whether the condition has improved with weight loss. Do not stop using CPAP until your health care team has confirmed that it is safe to do so as this may affect your weight loss if the condition remains untreated.

Nutrition

Bariatric surgery, by its very nature, requires a major change in nutrition habits. Knowing what to expect and slowly changing your behaviours related to food and your eating habits leading up to surgery can help you transition easier to this new way of life following surgery. Portion sizes, food types and timing of food and drink are only a few things that will change after having surgery. In the months leading up to surgery and in the months following surgery you will meet with a dietitian to create an individualized plan on what specific areas you need to focus on when preparing or recovering from surgery. Being followed by your health care team is important to ensure that you are absorbing necessary vitamins and minerals and also to help you in assessing the composition of the foods you are eating. Reading labels, keeping a food diary and taking supplements are all critical to the success of this surgery. Follow up bloodwork will be done 6 months post-surgery to ensure that you are absorbing nutrients and are not experiencing any deficiencies.

Nutrition: What to do before surgery.

Bariatric surgery will change everything in relation to food for the rest of your life. Therefore, prior to surgery it is important to examine all aspects of your nutrition habits including what you eat, when you eat, how much you eat and how you eat. Working towards a healthy balanced diet is important in the months leading up to surgery to cement changes to your diet and allow for an easier transition after surgery.

Prior to surgery, start reading labels, keep a food diary and start familiarizing yourself with areas where you struggle in terms of eating. Start thinking of how you may address these areas and also work with your health care team to implement strategies to work towards changing these habits. Some patients struggle with sugar sweetened beverages, others with emotional eating, others with snacking or skipping meals and still others with eating out due to their busy and stressful lifestyles. These are only a few examples of common areas of vulnerability for patients around food. Everyone has an area which can be “tweaked” to help them improve their health going into surgery as well as to help them successfully lose weight following the surgery.

The following is a list of lifestyle changes which you may want to practice leading up to surgery...

- Keep a food diary – science shows us that those who self monitor lose more weight and keep it off longer than those that don't. (See Food Diary section).
- Portion sizes – use smaller plates and utensils or containers for food “on-the-go”
- Small bite sizes and chewing food about 20-30 times with each bite
- Avoid eating until you are “stuffed”. Stop eating when you feel satisfied in order to avoid pain after surgery related to quantity of food or lack of chewing.

- Separate solid food and liquid. Sip food throughout the day instead of in large quantities with meals. After surgery you will not be able to eat and drink at the same time due to your smaller sized stomach. Carry water with you at all times to help avoid dehydration.
- Start looking closely at protein and carbohydrates when label reading (see “How to Carbohydrate Count”).
- Increasing protein is an important part of healing after surgery.
- Decreasing carbohydrate can be helpful for some patients especially those with insulin resistance. Talk to your health care team.
- Look into protein supplements, particularly if you have a hard time eating protein in your day to day.
- Cut back on caffeinated and carbonated (fizzy) drinks.
- Keep the house a safe zone! Do not allow “tempting” foods into your cupboards. Instead, keep treats out of the house and reserve them for special occasions.
- Avoid thinking “I’m never going to eat this or that after surgery.” Over eating before surgery can cause weight gain.

Pre-Operative Diet

Your liver partially covers your stomach and will need to be lifted during the operation. In the weeks leading up to surgery your health care team will prescribe you a special “pre-op” diet to help you lose weight leading into surgery and also help reduce the chance of an injury to your liver. This will be tailored to you individually depending on your specific needs and health conditions. Some medications may need to be adjusted during this period, especially those related to diabetes, for example.

Post Operative Diet

After surgery you will not eat for the first day. This is to help ensure your surgical site heals in order to prevent a leak at the site.

Post Operative Day 0 & 1: Clear Fluids

You will be started on a clear liquid diet (juice, broth, jello) the day after surgery. You will not be allowed carbonated beverages at this time and you are strongly encouraged to avoid coffee or tea because they may fill the stomach too much and cause heart burn.

After surgery the stomach is inflamed and the pouch will probably hold 1-2 ounces of food or drink. Aim for $\frac{1}{4}$ - $\frac{1}{2}$ cup of fluid every hour while you are awake. If you have pain or nausea please stop drinking. Give yourself a rest, then try again later. Talk to your health care team if this pain or nausea remains unresolved.

Post-Operative Day 1 to 14: Full Fluids

If you tolerate clear fluids with no problems you will be able to progress to a full fluid diet. Your full fluid diet will likely last 14 days and you will go home on this diet. This diet includes fluids and easy to swallow foods. High protein drinks that are low in sugar are ideal for this time. You may drink or eat about 2 tablespoons every 15 minutes. Spend 1 to 1.5 hours eating your meal which is about $\frac{1}{2}$ - $\frac{3}{4}$ cup of full fluids. Stop eating if you experience any pain or discomfort. Take your time.

Foods allowed on the full fluid diet include:

Milk or milk alternatives (unsweetened)
Cottage cheese
Plain Yogurt
Diluted soup with blended protein (chicken, fish, meat)
Thin custard
Creamy soups
Plain Oatmeal
Tomato juice (avoid puréed or solid fruits or vegetables)
Thinned applesauce
Silken or soft tofu
Broth
Water
Decaffeinated coffee/tea
Non carbonated sugar free beverages (Crystal lite, Mio)
Sugar free Jello
Glucerna or protein shake (1/3 of bottle)

Post Operative Day 14 to 28: Progressing from Full Fluid to Pureed Foods

Once you are tolerating full fluids, you may proceed to pureed or blended foods for another two weeks. Foods can be made using a blender to create a baby-food-like consistency. Eat 2 – 4 tablespoons every 15 minutes to a total of $\frac{1}{2}$ - $\frac{3}{4}$ cup at each meal. Again, take time to eat your meals. Allow 1 – 1.5 hours for each meal. Stop eating if you feel pain and try again later after taking a break. Eat slowly, avoid distractions and aim for 3 small meals and 3 snacks a day. Every meal and snack should consist of protein followed by vegetables then fruit and lastly grain products.

All foods on the full fluid diet can be continued during this time with the addition of foods such as ricotta cheese, oatmeal, mashed potato or yam, pureed cooked vegetables and cooked fruits without skin or seeds, pureed meats (chicken, turkey, fish), beans, smooth tofu, poached eggs or pureed vegetable protein.

Avoid: nuts, seeds, tough skins, dried fruits

Limit: sugars, spicy foods, added fats and oils.

Important: Drink 6-8 cups a day of water or calorie free fluids. Do not drink ½ hour before or ½ hour after meals.

Progressing to Soft Solids

Slowly you can introduce soft foods following the pureed diet. It is recommended that you do this very slowly and choose foods that can be pureed followed by soft foods, and eventually solid foods when you are tolerated all the other foods. During this time it is important to continue with your food diary. This will help you identify any foods which may cause discomfort and also help you ensure that you are getting all the necessary foods to maintain your health.

- When you meet with your dietitian, be sure to mention any foods which may have triggered any type of discomfort and what that discomfort felt like.
- Continue to watch portions (about ¼ cup for the gastric bypass and 1/3 to ½ cup for the sleeve gastrectomy).
- Eat 3 small meals and 2 snacks each day
- Listen to your body: Eat only until you feel full. You may be able to slowly increase your portion sizes but only eat until you start to feel full.
- Chew your food well, at least 25-30 times per spoonful.
- Separate solids and liquids (no drinking any fluid within ½ hour before or after a meal).
- Avoid carbonated (fizzy) beverages
- Avoid caffeine
- Take your multivitamin and mineral supplements as recommended by your doctor.
- Avoid gum, hard candy, straws and talking while eating.
- If you vomit your next meal should be fluids. Then you can return to solid foods following the fluid meal. If the vomiting continues please contact your health care team.

Vitamin and Mineral Supplements

All bariatric surgery patients must take vitamin and mineral supplements after surgery. Following surgery, for the first 2 weeks minimum, patients should take chewable or liquid forms of the supplements and then can continue on to tablets when tolerated. It is important to note that calcium and iron supplements can interact with multivitamin and mineral supplements and so should be taken separately to avoid this interaction and ensure proper absorption of all the vitamins and minerals.

Below is a table of recommended supplements. This is just a general suggestion and may be tailored by your health care team to fit individual patient needs and health conditions.

SUPPLEMENT	DOSAGE	SUGGESTED SCHEDULE	SURGERY TYPE
MultiVitamin			
Calcium citrate with Vitamin D3			
Vitamin B12			

Protein Supplements

Following surgery it is important to pay special attention to the amount of protein you consume. Protein intake is particularly important for wound healing immediately after surgery. Ideal protein powders or supplements should be low in carbohydrates (less than 5g of net carbohydrate per serving) and high in protein. Unflavoured protein powders are generally low in sugar and high in protein and can be added to many foods such as soups, stews, or cottage cheese or made into drinks. You can find protein supplements at most grocery store and health food stores as well as at some pharmacies and online. Ask your health care team for guidance if you are unsure what type of protein supplement is best for you.

Returning Home: What happens after surgery and discharge from hospital?

Most patients will recover in hospital for 1 to 3 days following surgery. After discharge you will slowly be able to return to normal activities as you heal.

- During the first 6 weeks of recovery avoid any strenuous activity especially that which involves any pressure on your abdomen or heavy lifting. Avoid housework during this period.
- Slow walking up to 2 km a day is encouraged. Walk at least 15 mins daily (this can be divided into several short walks and slowly built up) within the first few days after surgery to help speed up and improve your recovery.
- Fatigue is normal following surgery. If you are feeling tired, ensure that you are getting enough sleep at night.
- Driving is restricted for the first 2 weeks after surgery or until you are fully off pain medication and are not experiencing any pain or discomfort.
- Avoid sitting or standing for long periods of time.
- Ask your surgeon before starting activities such as swimming or weight lifting. Avoid lifting anything greater than 10 pounds for at least 6 weeks after surgery.
- **IMPORTANT:** Although you may have some discomfort at the surgical site, please advise your health care team if you are experiencing significant pain that is not getting better over time or is not resolving. It is also normal to experience some shoulder pain following surgery because gas can be trapped in your abdomen and will slowly disappear over the first few days.

Mental Health and Cross-Addiction

Research has shown and continues to show that food can be an addiction that affects the same areas of the brain as drugs and alcohol. Many patients believe that once they have surgery they will no longer have the emotional connection with food they once did and that they will no longer have the compulsion to eat like they did prior to surgery. Unfortunately for many patients, this is not their experience. Understanding this fact prior to undergoing surgery is critical to the health and well-being of patients after they have completed the surgery.

If mental health issues which caused patients to turn to food are not addressed prior to surgery it is common for patients to turn to other addictions. If patients are no longer able to turn to food, coping through drugs, alcohol, gambling, sex and other addictive substances or behaviours to help deal with stress and emotions after surgery can become a concern. Bariatric surgery will help patients to address their battles with weight, which many patients have struggled with for decades. However, it does not address any of the other areas of stress which may have caused stress leading up to surgery and will remain after the surgery is over. Unresolved issues related to trauma, abuse, neglect and other stressful situations need to be addressed prior to surgery. Taking away the ability to comfort using food can put patients at high-risk for cross addiction.

Your health care team is dedicated to not just your physical health during this process but also to your emotional health. Reducing your risk for cross addiction is critical to the success of this surgery and those patients who have spent time on addressing their emotional and mental health are most successful with long term weight loss and maintenance. Please talk with your health care team regarding any concerns you may have with regard to your mental health during this process. They can provide you with many resources to help you.

Common Problems and Concerns Following Bariatric Surgery

Constipation

Constipation can be caused by a number of factors including,

- Using narcotic drugs for pain control
- Inadequate fluid intake
- Inadequate dietary fibre, fruit, vegetables combined with high protein intake
- Iron supplements

Tips for improving constipation (once you have progressed to pureed or soft foods)

- Increase fibre through vegetables and fruit
- Benefibre supplement added to foods
- Increase fluid intake
- Increase exercise

NOTE: *If constipation does not improve, please talk to your health care team.*

Diarrhea

Diarrhea may be caused by the following factors, including,

- Lactose Intolerance can develop temporarily after surgery. Switching to milk alternatives (eg. almond milk, cashew milk, soy milk) may help improve these symptoms. Yogurt and cheese have lower amounts of lactose and may be more easily tolerated.
- High sugar intake
- C-Dif (Colstridium Difficile): Bacterial infection in the bowel

If you suffer from diarrhea, limit milk and milk products, greasy foods and high fibre foods. Ensure you are having small meals and you are continuing to drink fluids between meals to help prevent dehydration.

Nausea and Vomiting

Mild nausea is a common symptom during the first few months of recovery from the surgery. Nausea and vomiting can be caused by eating too much, eating too fast or not chewing food enough (at least 25-30 times before swallowing), eating and drinking at the same time, eating foods that are too dry, gulping and eating while distracted.

If nausea or vomiting occurs:

- Stop eating or drinking immediately until symptoms subside
- Return to full fluids or pureed foods for a day or two before restarting solid foods
- If a certain food caused nausea or vomiting avoid that food for a few days before trying it again
- Make sure you take time to eat without any distractions and ensure food is fully chewed
- Avoid drinking fluids that are too cold, are caffeinated or carbonated
- Do not drink fluids and eat solids at the same time

NOTE: Contact your doctor if nausea or vomiting persists for more than 24 hours.

Heartburn or Reflux

Following surgery all patient will be prescribed medications to reduce production of stomach acid. Avoiding carbonated beverages, caffeine and other acidic foods and drinks, and spicy foods can help to reduce the chances of developing heartburn.

Dehydration

Dehydration presents with the following symptoms:

- Dark urine
- Headaches
- Dizziness
- Fatigue
- White coating on the tongue

Diarrhea and vomiting will increase your risk for dehydration. Healthy patients should ensure they are drinking at least 6-8 cups of fluid per day. This amount is increased when patients suffer from diarrhea or vomiting. **NOTE:** If these symptoms do not resolve or you are not able to drink enough fluids because of these symptoms, please contact your health care team immediately.

Dysphagia (Difficulty Swallowing)

Difficulty swallowing can be a side effect of both surgeries. Patients may experience pain in their esophagus, tightness in the throat and chest pressure after eating too fast, eating too much or failing to chew food adequately before swallowing.

Decreased Appetite and Taste Changes

Following surgery, many patients report a reduction in appetite and that some of their tastes and food preferences change. This is totally normal and may continue to change and improve over the time. Continue to monitor your intake and ensure that you are including all necessary nutrients as well as enough fluid to prevent malnutrition and dehydration.

Food Intolerances

Following surgery, patients can develop some food intolerances. The following is a list of foods that can be the most problematic:

- Dry (roast beef, turkey, pork)
- Gummy (fresh bread, pasta, rice) – these foods tend to become “gummy” and can cause a blockage in the stomach pouch. Toasted bread, crackers and tortilla shells are generally more easily tolerated.
- Stringy (chicken, celery, fibrous fruits and vegetables)
- Abdominal cramping can occur with some vegetables
- Lactose Intolerance (as previously discussed)
- Sensitivity to alcohol

Gas and Bloating

Gas and bloating is very common especially in the first few weeks after surgery.

- Drink slowly and no more than 4 tablespoons of fluid at once
- Do not use straws when drinking
- Do not chew gum
- Avoid carbonated beverages
- Avoid foods that contain sugar alcohols such as sorbitol, mannitol and xylitol

Dumping Syndrome

Dumping syndrome is more common following Gastric Bypass than Sleeve Gastrectomy and is usually related to eating food that is rich in refined sugars, high glycemic carbohydrates and greasy, fatty foods. This syndrome can be divided into two types, early and late dumping syndrome.

Early Dumping Syndrome occurs 30-60 minutes after eating and may last up to one hour. During this time patients may experience sweating, flushing, nausea, diarrhea, dizziness, cramping, loose stool, weakness, upper abdominal fullness, vomiting and heart palpitations.

Late Dumping Syndrome can occur one to three hours after eating. This is due to low blood sugar and can present with symptoms such as sweating, shakiness, loss of concentration, fatigue, hunger, rapid heart rate and fainting.

Prevention of Dumping Syndrome:

- Avoid foods that are high in sugar and/or high in fat for example sweets, doughnuts, muffins, cakes, fast food, fries, ice cream, fruit drinks, sugar sweetened beverages
- If the ingredients include glucose, fructose, sucrose, cane sugar and syrups within the first three ingredients avoid these products!
- Aim for less than 10g of sugar per serving
- Choose foods with less fat (look for less than 5% of daily value on the label)
- Avoid drinking fluids with meals (drink ½ hour before and ½ hour after meals)
- If food seems stuck do not force it with fluids. This may cause you to vomit. Let the food pass naturally before eating or drinking anything else.

Hair Loss

Hair loss can occur four to eight months after surgery and is most commonly associated with rapid weight loss. This is only temporary and hair will regrow. Eating enough protein, taking prescribed supplements and eating nutritious meals will help to slow hair loss and promote hair regrowth.

Metabolic Changes

Following surgery there may be hormonal and metabolic shifts which can result in changes to medications. This is especially common with diabetes medications including both oral medications and insulins, high blood pressure medications and diuretics (water pills). If you are on any of these medications prior to surgery please talk to your doctor about symptoms to watch for as well as any changes to be made regarding which medications to stop or continue at the time of surgery.

Strictures

If you continue to vomit despite following all proper eating techniques and your saliva is white, sticky and foamy you may have a stricture. A stricture is caused by excessive scar tissue which can occur when the opening between your pouch and the small intestine is too tight. If you have concerns that this may be an issue, it is important to see your surgeon right away.

NOTE: Smoking can increase the risk of stricture which is why patients must remain smoke free for 6 months prior to surgery.

Swelling and Bruising

After surgery, some swelling and bruising is normal. However, if bruising or swelling becomes more severe this may be caused by an infection or bleeding. Talk to your doctor immediately if swelling and bruising are not resolving or you are having ongoing pain in your abdomen.

Ulcer

Ulcers can develop at the site of the connection between the stomach pouch and the small intestine. If you experience pain when eating, bleeding (bloody stool), vomiting blood and nausea, seek medical attention immediately.

Ulcers are treated using medications which reduce stomach acid. Avoiding smoking and NSAID medications (eg. Advil, Ibuprofen, Motrin, Naproxen, Aleve, Naprosyn, Indomethacin, Indocin, Nabumetone, Relafen and Aspirin) and corticosteroids (eg. Prednisone) can help reduce your risk of developing an ulcer. Taking acid reducing medications for at least 3 months after surgery can also reduce your risk of ulcer.

Post-Surgical Wound Care

After surgery your wounds will be covered in steri-strips or tape. There should not be any significant drainage from these sites and the steri-strips should be left on to fall off on their own. A drain may be left in at first on your left side which may cause some discomfort at the insertion site.

In order to help keep your wound clean and help avoid infection, shower or wash the area once a day and gently pat dry. Do not use any products, including polysporin or antibiotic creams unless prescribed by your doctor or surgeon. Try to leave the incisions open to air when possible to aid in healing.

Abdominal Pain

Weight loss following surgery can lead to internal hernia and gallstone formation. If you develop any type of pain or nausea in upper abdomen after meals following surgery contact your doctor or go to the emergency department if your doctor is not immediately available. This may be an internal hernia or gallstone attack and therefore you require immediate medical attention.

Summary of Normal Symptoms to Expect After Surgery

- Mild or moderate pain or discomfort at surgical site immediately following surgery
- Mild to moderate fatigue
- Moderate swelling or bruising
- Itchiness at the surgical site as the incision heals
- Numbness in the abdomen for 2-3 months following surgery
- Small amount of nausea following surgery related to anesthetic, pain medications and inflammation of the stomach

Symptoms Which Require Immediate Medical Attention

- Any bleeding or signs of infection from surgical sites (redness, heat, pus-like drainage, foul-smelling drainage, swelling, pain)
- Fever greater than 38 degrees Celsius
- Severe bloating
- Continued nausea, vomiting, diarrhea
- Inability to tolerate liquids
- Dark, foul smelling stool
- Dark urine or decreased urine output
- Sweats
- Cramping or severe pain in the leg
- Pain not relieved by over the counter pain medication

*****CONTACT 911 for ANY symptoms such as difficulty breathing, chest pain, or urine output less than 4 times in 24 hours*****

Exercise and Fitness Following Surgery

Combined with nutrition, exercise is one of the most important tools to be used to ensure weight loss success following surgery. Studies have shown us that participating in regular exercise following bariatric surgery is critical in helping patients maintain their weight loss long term. However, along with assistance with weight maintenance, exercise has a number of other health benefits that are not to be overlooked when it comes to post bariatric surgery health. Exercise helps increase insulin sensitivity in the body, which can improve blood sugars and therefore decrease the risk of developing type 2 diabetes. Exercise can also play an important role in improving hypertension (high blood pressure) or helping to prevent development of hypertension. Participating in regular aerobic (“cardio”) exercise will also help increase cardiorespiratory fitness which increases the efficiency of oxygen delivery to muscles during exercise. It also helps to build and preserve muscle during weight loss. Also, even a small amount of daily exercise has been widely shown to help improve mood and overall mental wellbeing especially following bariatric surgery.

Participating in some form of exercise, such as walking, swimming, or biking for 150 minutes a week (30 minutes a day/5 days a week) is an essential component of health following bariatric surgery. Bariatric surgery alone does not make for a healthy lifestyle, exercise does. Regular and consistent exercise will help with success in weight loss and prevention of weight gain long term as well as providing many other health benefits.

NOTE: Ensure you hydrate adequately when exercising. Be sure to increase fluids especially if exercising or sweating for prolonged periods.

Post Bariatric Body Contouring (PBBC) / Plastic Surgery

The decision to pursue surgery to remove excess skin and fat in order to change physical appearance or improve function or mobility in patients that lose significant amounts of weight is deeply personal. For patients who decide to undergo body contouring, they may do this for either cosmetic reasons or functional reasons if the excess skin impedes physical activity. Not all patients who lose weight wish to have plastic surgery following their weight loss, however, for some patients this will be the final stage in the bariatric program.

The most common body contouring procedures for bariatric surgery patients are the tummy tuck (abdominoplasty), circumferential body lift, breast lift (mastopexy), arm lift (barchioplasty) and thigh lift.

The decision to undergo body contouring should not be taken lightly. These are significant surgeries which can have a major impact on your life including significant time off work in some cases and recovery periods which limit physical activity and can result in short-term dependence on friends and family for support in daily activities and housework.

In order to be considered for these surgeries patients should be at a stable weight for at least 6 months leading up to the procedure. Consistency with healthy eating and exercise should be continued leading up to surgery.

Just as with the bariatric surgery, an extensive workup will be done to ensure that you are a candidate and meet criteria for surgery. The surgeon will complete a physical exam and review your health history to identify any risk factors which may be related to the surgery. They will also order any health investigations required and discuss your hopes as well as provide education related to the procedure. At this time, expectations regarding the results of the procedure as well as the details of recovery should be discussed as well. If the surgery is being done privately a quotation or estimate of fees should also be provided at this point. In British Columbia, body contouring is not currently covered by the Medical Services Plan (MSP). The price of the surgery will vary from patient to patient depending on the complexity of the surgery required.

HOW TO KEEP A FOOD DIARY

An *overwhelming amount of scientific evidence* shows that keeping a food diary is an important weight-loss tool. We can be very motivated to keep a food diary at first, but then life takes over, our priorities and focus shift to other aspects of our lives and we stop tracking our food. Previous bad experiences and failed attempts at keeping a food diary can also make us feel discouraged or afraid. No one likes to be faced with what we are “not good at”.

Studies show us that decreased focus on food journaling correlates with decreased focus on mindful eating. If we are looking to change our life long habits around food and food behaviors, then we need to be very aware of what we are actually eating. This is especially important when we become distracted from our health goals during life’s stressful and busy times. What we think we are doing, what we are actually doing and what we should be doing are 3 different things and keeping a food diary is our best way of figuring it out.

MOTIVATION IS NOT JUST BORN.....IT IS MADE.

When we engage in lifestyle change there are often a variety of negatives. We focus too much on what we can’t do, what we can’t eat, and what we are missing out on. A food diary should put the focus on what you are doing now and where the changes need to be made. It is a template for change, a template for awareness. It can also be a great tool for analyzing what *we are* doing well. We can build on the quality of our food intake and focus on our healthy choices that can be beneficial for weight loss.

Committing to keeping a food diary, regardless of changes to our food choices, is part of the behavioral change process. We can feel success even in one small change. When we feel success, then we think with more positivity and this motivates us to keep going.

SOME BASIC RULES TO FOLLOW:

- 1. Keep it honest:** your food diary can be for your eyes only. This is about what you are doing and what you are eating. If you are going to get “creative” with your food recording, it will not be a reflection of what you are truly eating.
- 2. Don’t beat yourself up:** This has to be a positive process. This is not grade school and it is not a test – you will not be judged. Your character will not be judged. This is not an exercise in guilt and disgust.

No one ever gains progress or improvement by keeping themselves in the dark. This diary will bring to light the areas that need to change in order for you to reach your goals. This is NOT a measurement of your worth.

3. We learn by making mistakes. When you go through your diary entries at the end of the day, BE KIND. Avoid negative thoughts and reactions such as “why did I eat that or do that?” or “I suck!”, or “I should have known better”, or “Tomorrow, I will be better”. You are not ‘bad’ and you don’t need to be ‘better’. Those words depict strength of character as being good or bad. This type of thinking is not helpful. Our default behaviors around food are long standing and ingrained in our daily lives and coping responses. We must have an avenue to look into these behaviors so that they may be changed for the long run and replaced with new behaviors that help us achieve our health goals. Instead of negative self-talk, ask yourself, “What can I do differently next time?” A positive, growth-mindset approach is key. It is through mistakes that we can achieve growth.

4. If you miss a day or several days, don’t give up! Just start with today. At best, we can do a 3 day recall, even then that might be a stretch. Set up a pattern or schedule of when you journal, try right after a meal, or after dinner or at bedtime. Try different schedules and see what one feels the best fit for you. Remember -- its *progress, not perfection* that we are looking for.

The key to keeping a food diary is not to judge how well you preformed in the process. Most people have been “messed up’ in the past by keeping a food diary. Think of it this time as an entirely new process.

COMMON MICONCEPTIONS AND BARRIERS TO KEEPING A FOOD DIARY

“If I have to write it down I won’t eat it”

This may be true for some, but that’s not the point of a food diary. We want you to see a food dairy as a blueprint for change- it should reflect where you are right now and act as a guide for where you need to make some healthy changes. A food diary is not a police office to prevent you from eating certain things. Seeing it like this will only encourage you to be dishonest with yourself regarding what you actually ate or it will encourage you to chastise yourself about your food choices. These thoughts may cause you to just avoid it all together.

“I forgot what I ate yesterday and had to sit down at night and recall the day in reverse”

This is a common event. We all have busy lives that revolve around certain habits and rituals. Adding a new ritual into the mix can be a task, for sure. It often gets missed or overlooked.

If this is the case for you, keep your food diary with you at all times just for a few days so that it becomes a visual cue for you to keep track of and record your food as you eat.

Alternatively, you could try to make a new habit or ritual where every night before going to bed you keep your diary by your bed and do that day's recall of the food. You could also do that days recall of emotions or positive affirmations. This could become a ritual exercise in self-care and positive thinking.

“I’m really bad at keeping a food diary”

We all are. Recording our behavior is not something we as human beings do. We are very good at being in the moment – at engaging in the behavior. Looking at our own behavior is not our strong point. It’s not about how well you do keeping track of your eating; it’s about what you learn. Forget how good or bad you are at keeping the diary and instead see what you learn by doing it. You may only learn that you are bad at keeping a food diary. But more likely you will learn where some of your “problem areas” are regarding food – a place for growth. Regardless, when you focus on the process of keeping the diary and not on the result of “how well you do” you have a much better chance of having a positive learning experience.

“I don’t like keeping a food diary”

This is probably true for most people as well, but when you think about all the things you do in a day that you don’t enjoy and yet do anyways, there’s a good chance you can do this too. There is so much about change that is not enjoyable, just like there is so much about body maintenance that is not enjoyable – like brushing your teeth, washing your bed linens. Does everything always have to be enjoyable to be worth doing? Sometimes we do things that are less than enjoyable but in the long term they become something that we benefit from. This lifestyle change may be something you will ultimately enjoy. A food diary is a step that you may not ever enjoy, but keep your eyes on the prize. Focus on the end result here: a healthier future and all that it implies rather than the lack of enjoyment from a daily process that, at most, takes five to ten minutes of your day.

“Keeping a food diary makes me obsess about food”

This is a common response. Writing out your food intake will not change your food thoughts and obsessions because they are already there. This process will only bring into light an awareness of what your intake actually is and then act as a blueprint for change. We can become easily distracted from dealing with the difficult ‘things’ in our lives. No one likes to be constantly reminded of his or her ‘faults’. The key here is that you will use your powers for good and not evil—you will think about food, but then use those thoughts to change patterns of behaviors for the better.

“Look how hard I am working and see how much ‘better I eat now’ compared to before and I am still not losing weight”

Unfortunately there is a physiological mal-adaptive process that is happening when we have obesity. This is where we inappropriately store excess fat tissue and do not burn it for fuel. There can be no guarantees that changing your food choices will lead to a decrease in the number on the scale.

However, we must remember that the process of weight-loss is to achieve increased health. Moving from high calorie, highly processed foods, with little vegetable intake and high in saturated fats, to an increase in vegetable consumption and a decrease in unhealthy foods absolutely makes us healthier overall. The number on the scale is one small piece of the picture. Our emotional health, physical fitness level, nutritional level, disease preventability, and energy levels should be our indicators for health.

In addition, we are changing our food intake as a treatment for your weight-loss. **When we are looking at diet or nutrition as a weight loss treatment, what works for some, may not work for others. It is not a math equation.** How your body responds to carbohydrates (even healthy ones) may be completely different to how someone else metabolizes the same amount of carbohydrates. By tracking, this will help us to better understand the amount of carbohydrate *your* body can tolerate. Bringing in your diary to your health-care team allows for us to help you to sort through this process. It provides us with a window into your every day, for example, what you like, what you don't like, when do you eat out, when do you stay home and cook. Do you like to menu plan or are you constantly on the run and grab "on the go" frequently? These behavior patterns will help us help you to make the changes in YOUR LIFE that will be *sustainable* for you. Whatever we do to lose weight, we have to continue to do in order to maintain that weight loss.

How do I get started?

Buy a book that you can journal in. Make it as easy for yourself as possible. Many people like the phone apps, as our phones travel with us everywhere. Some people find the apps cumbersome and not quick and easy to use, while others really like the detail that the apps can provide. For other people, old-fashioned pen and paper works the best. We have sample food diary sheets that have the entire week on one sheet. These are helpful so you can really see patterns and frequencies of certain foods. Attached are a few samples of diaries and below is a list of apps for phones and computers. And then... **YOU JUST START!**

www.myfitnesspal.com
www.calorieking.com
www.myfooddiary.com
www.sparkpeople.com
www.loseit.com

Food Journal Date: _____ - _____

	Breakfast	Snack	Lunch	Snack	Dinner	Snack
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						

WHAT IS CARBOHYDRATE COUNTING?

Carbohydrate counting, or “Carb counting”, is one tool that can be used to help support dietary change in the treatment of obesity and/or diabetes. Carb counting involves keeping track of the amount of available carbohydrates in the foods we eat each day.

Carbohydrates are one of the main nutrients found in food and drinks. Protein and fat are the other main nutrients. Carbohydrates include starches, sugars, fruit, vegetables and fibre. Carbohydrate counting can help control your blood glucose (also called *blood sugar*) levels and this will help decrease the *Insulin* requirements, which affects fat accumulation and utilization.

The amount of carbohydrate in foods is measured in grams. **To count grams of carbs we need to:**

- Know which foods contain carbohydrates
- Learn to read a food label
- Learn to estimate the number of grams of carbohydrates in the foods we eat
- Add up the number of grams of carbohydrates from each food we eat to get either our daily total or total amount for each meal
- Evaluate the right amount of carbohydrates that works for you to reach your goals, whether that is weight loss or diabetes management.

Why it is helpful for you to count carbs and how it will help you reach your goals starts with understanding the process of how our bodies metabolize carbohydrates...

UNDERSTANDING CARBOHYDRATES

Carbohydrates in food are digested into small pieces---the main piece being glucose. Glucose (a.k.a **sugar**) is absorbed through the small intestine and enters the blood stream, causing blood sugar levels to rise. Our bodies utilize that glucose for energy. Glucose is not our only nutrient used for energy, but it is the one that our bodies use most readily, and it typically is the most available energy source in our diets.

As soon as we start eating any carbohydrate – simple sugars or complex starches, our digestive enzymes start to breakdown the food as soon as it hits the saliva in our mouth. As the food moves down into our stomach and through our small intestine, our digestive enzymes breakdown that food molecule further into its smallest form – glucose. Once that glucose enters the bloodstream, it does not matter where that glucose came from. It does not make a difference whether it came from brown rice or a chocolate chip cookie, once it is there, our body has to move that glucose out of the blood stream. In response to digesting carbohydrates, our body releases Insulin.

Insulin is a hormone produced by the pancreas in response to eating glucose. Our bodies work hard to regulate our blood glucose levels by releasing the right amount of insulin required to regulate the blood sugar. Insulin allows for glucose to enter the cells. Without insulin, our blood glucose levels would remain high.

However, our working cells only use glucose when they need it. Once our working cells have reached their limit of glucose, the liver stores some of the excess for distribution between meals should blood glucose levels fall below a certain threshold. If there is left over glucose beyond what the liver can hold, it will be turned into fat for long-term storage. When carbohydrates are scarce, the body runs mainly on fats. If energy needs exceed those provided by fats in the diet, the body must use some of its fat tissue for energy (It will also use some of its stored protein source or muscle as well).

Obesity is a disease that manifests as an inappropriate storage of fat tissue and inappropriate ability to utilize that stored fat for fuel. The hormone insulin is an important hormone in this storage of fat as well as the utilization of glucose for energy. When our body's main nutrition components come from carbohydrates and our bodies are having a difficult time with processing that glucose, research shows us that carbohydrate reduction is an important part of weight management as well as blood sugar control. This is not to say that a low carb diet is THE ANSWER for everyone that carries extra fat tissue, as many research studies show us that Very Low Carbohydrate Diets (VLCD) may not contribute to long term weight loss success for everyone. VLCD is very difficult to maintain. **It is important to remember that whatever we do to lose weight, we must maintain in order to prevent weight regain.** Modified, or a reduced carbohydrate diet is what we are trying to attain to achieve and maintain long-term weight loss.

KEY POINTS:

- All carbohydrates breakdown to glucose (a.k.a. sugar)
- Insulin is required to allow the sugar to leave the bloodstream and enter the cells
- Insulin plays a major role in fat accumulation and storage
- Modified, or reduced carbohydrate diet can help with weight loss and help with long term weight loss/maintenance

TYPES OF CARBOHYDRATES

You will hear terms like complex carbohydrates, simple carbohydrates, whole grains, processed grains, enriched grains, naturally occurring sugar, sugar added, low-calorie sweetener, high fructose corn syrup, sugar alcohols, reduced-calorie sweeteners, sweets, etc. etc. No wonder knowing what kind and how much carbohydrate to eat is confusing? Our goal is to take the confusion out of what is a carb and to figure out what is right for you.

6 main types of carbohydrates: Starches, Fruit, Vegetables, Fibre, Sugar, Dairy

STARCH

Foods high in starch include:

- Starchy vegetables like peas, corn, potatoes, parsnips, pumpkin, squashes
- Legumes and “meat alternatives” like dried beans, lentils, kidney beans, black eyed peas split peas, and lima beans
- Grains like oats, barley, rice, rye, quinoa and buckwheat, and wheat. (The majority of grain products in the US and Canada are made from wheat flour. These include pasta, bread and crackers). Even “gluten-free” products contain starches like rice and sugar.
- The grain group can be broken down even further into whole grain or refined grain.
- The grain includes three parts:
 - Bran
 - Germ
 - Endosperm
- The bran is the outer hard shell of the grain. It is the part of the grain that provides the most fiber and most of the B vitamins and minerals.
- The germ is the next layer and is packed with nutrients including essential fatty acids and vitamin E.
- The Endosperm is the soft part in the centre of the grain. It contains the starch.

Whole grain means that the entire grain kernel is in the food. If you eat a whole grain food, it contains the bran, germ and endosperm so you get all of the nutrients that whole grains have to offer. If you eat a refined grain food, it contains only the endosperm or the starchy part so you miss out on a lot of vitamins and minerals. Because whole grains contain the entire grain, they are much more nutritious than refined grains. However, beware that even whole grain bread usually isn't entirely made out of actual “whole” grains. They are grains that have been pulverized into very fine flour. Even though this process preserves the nutrients, it causes these products to be digested rapidly.

Fibre

Fibre is the part of the plant that our bodies cannot digest. There are two types of fibre: *Soluble* and *Insoluble*. Foods such as vegetables, fruits, legumes and whole grains contain fibre. Animal foods such as meats and eggs have no fibre. Fibre slows down the digestion as the carbohydrate moves through the stomach and small intestine and slows down the release of glucose into the blood stream. Fibre also has many other properties that are beneficial to us.

- **Soluble fibre** is the soft fibre that helps control blood glucose and reduces cholesterol. It also helps in managing diarrhea. Soluble fibre is present in oat bran, oatmeal, legumes (dried beans and lentils) and fruits such as apples and strawberries.
- **Insoluble fibre** is the bulky fibre that helps to prevent constipation. It also helps to prevent some types of cancers. It is present in wheat bran, whole grain breads and cereals, fruits and vegetables. Many foods contain both soluble and insoluble fibre.

KEY POINTS:

- When choosing starches, choose the least refined option
- Refined starches are void of fiber and will spike your glucose quickly, leading to higher insulin levels
- Higher fibre amount will slow the glucose release into the blood stream
- Refined starches are the least nutritious

FRUIT

Fruit is a disaccharide -- meaning a 2 sugar molecule "chain". It is made up of Glucose and Fructose. Even though the "chain" is shorter than a complex starch, which is a longer "chain", fruit is considered a *complex carbohydrate* because it contains fibre. Although considered a part of a healthy diet, as it contains vitamins, antioxidants and fibre (levels depend on the fruit) it does raise blood sugar quite high -- much, much higher than vegetables and should not be treated as equal to vegetables in terms of servings of vegetables/fruit per day.

NOTE: One small apple is the same available glucose as one slice of bread.

VEGETABLES

Although considered a carbohydrate, they are mostly made up of fibre, vitamins and minerals. Starchy vegetables contain higher levels of starch than other vegetables (see **STARCHES** above).

Non-starchy vegetables have very low impact on blood sugar and are the healthiest choice for any diet. Examples of non-starchy vegetables are asparagus, broccoli, carrots, celery, green beans, lettuce and other salad greens, peppers, spinach, kale, tomatoes, and zucchini.

DAIRY

Many dairy products including yogurt and milk contain natural sugars. For instance, both plain yogurt and flavoured yogurt include carbohydrate. One glass of milk or one cup of yogurt have approximately the same carbohydrate as a small piece of fruit or a slice of bread.

SUGAR

Sugar is another type of carbohydrate. You may also hear sugar referred to as simple or fast-acting carbohydrate. Sugar has no fibre and is a very 'simple molecule' and short "chain". Table sugar does not require much digestion time to breakdown therefore the glucose level in the blood stream rises very quickly. Thus needing a very fast and higher level of insulin to cope with the blood sugar spike.

There are 2 main types of sugar:

- *Naturally occurring sugars*, such as those in milk or fruit
- *Added sugars*, such as those added during the processing such as sugar added to make a cookie, or in flavoured yogurt.

On the nutrition facts label, the number of sugar grams includes both added and natural sugars.

SUGAR HAS MANY DISGUISES

Careful reading of labels is necessary to know how much added sugar you are eating. Sometimes there will be small amounts of many types of sugars, so none of them are listed in the first few ingredients of the label. Other times, sugar hides as apparently more "healthy" ingredients, such as honey, agave, rice syrup, or even "organic dehydrated cane juice". These are all sugars and therefore still have the same effect on your blood sugar as white table sugar.

Did you know?

- 1 teaspoon of table sugar = 4 grams of sugar
- 1 tablespoon of Heinz Ketchup contains 1 teaspoon of sugar
- $\frac{3}{4}$ cup of 0% vanilla-flavored Greek yogurt (Liberte) contains 19grams of sugar = almost 5 teaspoons
- 1 355ml can of Coca-Cola contains 39 grams of sugar = almost 10 teaspoons

WHY IS KNOWING *WHAT TYPE AND HOW MUCH CARBOHYDRATE I EAT* IMPORTANT?

There is a difference between eating whole grain, or refined processed grains, or between eating candy or eating fruit. Even though it is all glucose in the end, it does matter how quickly and how high the blood glucose level rises and how much fibre we take in. This is referred to as the Glycemic index. The Glycemic Index (GI) is a scale that ranks carbohydrate-rich foods by how quickly they raise blood glucose levels. Lower glycemic index foods will slowly raise blood glucose levels whereas high glycemic index foods quickly raise blood glucose levels. The faster and higher the blood glucose level rises, the higher the amount of insulin will be required. Refined starches and simple sugars contain very little fibre and are higher in the Glycemic Index. They do not require much time during digestion to break down into glucose. The blood sugar release is very quick. Eating a diet high in processed foods will typically be a diet full of high Glycemic Index foods.

HOW MUCH CARBOHYDRATE SHOULD I EAT EACH DAY?

When we are embarking on carb counting as a tool for treating obesity or diabetes, we must consider the individual and their ability to process carbohydrates. How well one person tolerates a certain amount of carbohydrates may be different from another person's ability to utilize that glucose for fuel, or how much of it will be stored as fat, and how it will utilize that stored energy.

KEY POINTS:

- The ability to tolerate or metabolize carbohydrates is different from person to person
- Number of carbohydrates should be determined on an individual basis – work with your health care team about your number.
- Daily carbohydrate goals will be determined based on results of sustained weight loss or maintenance and/or improved blood sugar management

CARBOHYDRATE COUNTING

HOW MUCH CARBOHYDRATE IS IN THE FOOD I EAT?

You will need to learn to estimate the amount of carbs in foods you typically eat. For example, the following amounts of carbohydrate-rich foods each contain about 15 grams of carbohydrate:

- One slice of bread
- One 6-inch tortilla
- 1/3 cup of pasta
- 1/3 cup of rice
- 1 small piece of fresh fruit, such as a small apple or orange
- ½ cup of pinto beans
- ½ cup of starchy vegetables such as mashed potatoes, cooked corn, peas or lima beans
- ½ cup cooked cereal (oatmeal)

Some foods are so low in carbohydrates that you may not have to count them unless you eat large amounts. For example, most nonstarchy vegetables are low in carbohydrates. A ½ cup serving of cooked nonstarchy vegetables or a cup of raw vegetables has only about 5 grams of carbohydrates.

As you become familiar with which foods contain carbohydrates and how many grams of carbohydrates are in food you eat, carbohydrate counting will be easier. Attached is carbohydrate content list that we have accumulated for you to review.

NUTRITION LABEL

You can find out how many grams of carbohydrates are in the foods you eat by checking the nutrition labels on food packages. Learning to read a food label is an important part of carb counting and an important tool to utilize for carbohydrate and nutrition awareness. Following is an example of a nutrition label:

Nutrition label tell you

- **The food's serving size – such as 1 cup or one slice**
- **The total grams of carbohydrates per serving**
- **The total grams of fiber**
- **The total grams of sugar**
- **Other nutrition information, including calories and the amount of protein and fat per serving**

Nutrition Facts	
Serving Size 1 cup (240g)	
Servings Per Container 2	
Amount Per Serving	
Calories 100	Calories from Fat 20
% Daily Value*	
Total Fat 2g	3%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 70mg	3%
Total Carbohydrate 17g	6%
Dietary Fiber 3g	12%
Sugars 5g	
Protein 4g	
Vitamin A 70%	• Vitamin C 20%
Calcium 15%	• Iron 8%

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

Grams of carbohydrates

NET CARBOHYDRATES VS TOTAL CARBOHYDRATES

- We want to know the amount of **available glucose** that our bodies will have to metabolize. This means we want to know the **NET CARBOHYDRATES**. Dietary fibre does not breakdown into glucose. What we are wanting to measure is the amount of available glucose that the carbohydrate will provide. This will directly tell us just how much glucose our bodies have to cope with and how much insulin will be required.
- Remember, insulin affects our fat storage and utilization of fat stores.

Net carbs = Total Carbs – Fiber
Based on the food label above, the Net Carbs for 1 serving would be 17 g total minus 3 g of fiber to equal 14 grams of net carbohydrates.
 $17\text{ g} - 3\text{ g} = 14\text{ g}$

- The sugar amount lets us know just how much of that carbohydrate is a simple-sugar, it does not tell us amount of “added sugar”, or total amount of glucose that will end up in our blood stream. As stated above, naturally occurring and added sugars are both included in the sugar amount on the food label.

COOKING AT HOME

To find out the amount of carbohydrate in home cooked/prepared foods, you’ll need to estimate and add up the grams of carbohydrate from the ingredients. You can use books or websites that list the typical carbohydrate content of homemade items to estimate the amount of carbohydrate in a serving. (See the carbohydrate content list attached to see estimates of home baking carbohydrate amounts.)

EATING OUT

Some restaurants provide nutrition information that lists grams of carbohydrates. You can also use carbohydrate content food list attached to estimate the amount of carbohydrate in restaurant meals. Many restaurants post their nutrition information on-line. We also have some on-line resources listed below.

HELPFUL TIPS FOR CARB COUNTING

- Determine out of what you are eating is carbohydrates
 - ✓ Tool: track what you are eating via a food diary
 - ✓ Highlight foods that include carbohydrates
- Figure out type of carb – is this a high or low glycemic carb?
- Figure out amount of carb (in grams)
- Figure out the right amount for you
 - ✓ Will this amount allow for weight loss, weight maintenance?
 - ✓ Are you able to sustain limiting your carbohydrate to this number long term?
 - ✓ Speak with your health care team to determine right amount for you

ON-LINE RESOURCES:

Canadian Diabetes Association:

<https://www.diabetes.ca/CDA/media/documents/clinical-practice-and-education/professional-resources/carbohydrate-counting-resource-english.pdf>

<http://www.calorieking.com>

<http://myfooddiary.com>

<https://www.myfitnesspal.com>

An example of carbohydrate counting using a food diary

Breakfast	Calories	Carbs	Fat	Protein	Fiber	Sugar	
Homemade - Oatmeal, 1 Cup	300	54	6	10	8	2	⊖
Raisins, seedless, 1 small box (1.5 oz)	129	34	0	1	2	25	⊖
Blueberries - Raw, 50 berries	39	10	0	1	2	7	⊖
Milk - Skim, 1 Cup	90	13	0	8	0	11	⊖
Add Food Quick Tools	558	111	6	20	11	45	
Lunch							
Little Big Bread, 2 slices	110	19	1	7	5	1	⊖
Turkey Breast - Lunch Meat, 2 oz	50	1	1	9	0	0	⊖
Cheese - Cheddar - Slice, 17 g	70	0	7	5	0	0	⊖
Banana - Dole, 1 medium banana (126g)	110	29	0	1	3	15	⊖
Add Food Quick Tools	340	49	8	22	8	16	
Dinner							
Sodexo Campus - Vegetable Lasagna, 1 serving	330	34	14	16	4	3	⊖
Great Value - Garlic Bread, 2 slice	300	30	18	6	2	0	⊖
Add Food Quick Tools	630	64	32	22	6	3	
Snacks							
Truscult Crackers - Crackers, 7 crackers	120	20	3	3	3	0	⊖
Apples, raw, with skin, 1 large (3-1/4" dia)	116	31	0	1	5	23	⊖
Cheese, cheddar, 1 gram	4	0	0	0	0	0	⊖
Mr. Christies - Arrowroot Cookies, 3 cookies	90	15	3	1	0	6	⊖
Starbucks - Grande Non Fat Vanilla Latte (Corrected), 16 oz.	200	37	0	12	0	35	⊖
Add Food Quick Tools	530	103	6	17	8	64	
Totals	2,058	327	53	81	34	128	

Using this example, we can easily see which foods have the most carbohydrate and use this information to help us brainstorm easy substitutions which can help to cut down on the overall daily carbohydrate count. (In this example, there was 327g of carbs consumed. (Net carbs: 327g – 34g of fibre = 293g. ***This is the equivalent of 73 teaspoons of sugar!***)

By “redecorating” our day and making some healthier substitutions, we can dramatically reduce the number of carbohydrates we are eating over the course of the day....

Breakfast	Calories	Carbs	Fat	Protein	Fiber	Sugar	
Blueberries - Raw, 50 berries	39	10	0	1	2	7	⊖
Sliced Almonds - Sliced Almonds, 2 tbsp	80	2	7	2	1	0	⊖
Cottage Cheese, Breakstone 2% - 2% Milkfat Cottage Cheeses, 1 cup	180	10	5	20	0	10	⊖
Silk Almond Milk - Unsweetened - Unsweetened Almond Milk, 1 cup	30	1	3	1	1	0	⊖
Add Food Quick Tools	329	22	15	24	3	17	
Lunch							
Turkey Breast - Lunch Meat, 2 oz	50	1	1	9	0	0	⊖
Cheese - Cheddar - Slice, 17 g	70	0	7	5	0	0	⊖
Cucumber - With peel, raw, 1 cup slices	16	4	0	1	1	2	⊖
Little Big Bread, 1 slices	55	10	0	4	3	1	⊖
Add Food Quick Tools	191	14	8	18	3	2	
Dinner							
Home Cooked - Chicken Breast., 100 g	165	0	4	26	0	0	⊖
Outtakes - Garden Salad (Large), 1 serving(s)	48	12	0	2	3	4	⊖
Add Food Quick Tools	213	12	4	28	3	4	
Snacks							
Cheese, cheddar, 1 gram	4	0	0	0	0	0	⊖
Mr. Christies - Arrowroot Cookies, 3 cookies	90	15	3	1	0	6	⊖
Starbucks - Grande - 2% Americano Misto, 1 serving(s) (16 fl oz ea.)	110	10	4	7	0	10	⊖
Planters - Deluxe Mixed Nuts, 1 oz. (28g/about 20 pieces)	170	7	14	5	2	1	⊖
Homemade - Fresh Veggies & Dip, 1 serving	100	0	7	1	8	2	⊖
Add Food Quick Tools	474	32	28	14	10	19	
Totals	1,207	80	55	84	19	42	

Now this individual is eating approximately 80g of carbohydrate and 42g of sugar.

CARBOHYDRATE CONTENT LIST

1. Bread Products	Serving Size	Carbs (g) (netCarb = total carb-fibre)
Bagel	4 ½ inch diam	60-90
Bread		
• Cracked wheat	1 slice	14
• Whole Wheat	1 slice	11
• Rye	1 slice	14
Bun, Hamburger or Hot Dog	1	22
Bread Stuffing	½ Cup	20
Breadstick - soft	1 bread stick	15-25
Bun: Hamburger, Hot dog	Regular size	30
Corn Bread	2" cube	15
Croissant	Medium	25
Croutons	¾ cup	15
Dinner Roll	Small	15
English Muffin	1 whole	30
Pancake	6" (avg size)	30
Pita Bread	Large 6"-9"	30-45
Pizza Crust	1/12"	16
Taco Shell	2 (5 inch diam)	15
Tortilla-corn	7"	15
Waffle (frozen type)	1	15
Wrap	Various sizes	See label
• Dempsters whole wheat Tortilla 61g serving		25
• Whole Wheat	10 inch diam	26

2. Cereals	Serving Size	Carbs (g)
Oatmeal		
• Old Fashioned Quaker Oats	½ cup uncooked	23
• Quaker Steel Cut Oats	½ cup uncooked	23
• Packaged Instant Oatmeal (Plain)	1 packet	17
• Packaged Instant Oatmeal (Various flavoured)	1 packet	28-33
Bran Flakes	1 cup	26
Cheerios	1 cup	19
Corn Flakes	1 cup	24
Holy Crap	2 tbsps.	7
Granola	1/2cup	30
Skinny B	2 tbsps.	4

Kashi Go Lean	1 cup	20
Kellogg's All-Bran Bran Buds	½ cup	17
Shredded wheat	1 biscuit	16
Oat Bran	1/3 cup	20
Flax seed	2 tbsps.	1-2

3. Crackers	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Melba toast	7 pieces	17
Ryvita, dark rye	4 pieces	15
Wasa, whole grain	2 pieces	15
Triscuit Cracker	6 pieces	17

4. Grains/Pasta	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Rice, cooked	1 cup	45
Pasta, cooked	1 cup	45
White Flour (dry)	½ cup	78
Rice flour (dry)	½ cup	78
Whole wheat Flour	½ cup	73
Quinoa cooked	1 cup	34
Couscous, cooked	½ cup	17

5. Bean/Legumes	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Hummus	1/3 cup	7.5
Chickpeas/garbanzo beans, kidney beans, lentils, navy beans, split pea	½ cup	10-15
Baked Beans	½ cup	18
Black Beans	½ cup	10-15

6. Starchy Vegetables	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Corn: cooked or canned	½ Cup	15
Corn Cob 6" - 9"	6" - 9"	30-45
Green Peas	½ Cup	15
Potato	Average Baked	60
Potatoes (hashed or mashed)	½ cup	15
Winter Squash (acorn, hubbard, etc)	1 Cup	20
Sweet Potato/Yams (plain)	½ Cup	20

7. Baked Goods	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Biscuit (large Bob Evans)	1	30
Biscuit (small Pillsbury)	1	10
Brownie-large (Zingerman's)	1	70
Cake 2 layer frosted	4" square	80
Chocolate Chip cookie-refrigerator dough	1	15
Cupcake with frosting	1	30
Danish (large bakery type)	1	45
Donut (Dunkin Donuts-plain or jelly filled)	1	25-40
Donut (Krispy Kreme)	1	20
Fruit Crisp	1/3 Cup	45
Fruit pie	1/8th of 9" pie	50
Muffin (homemade standard size)	1	20-30
Muffins (bakery type)	1	60-75

8. Snack Foods	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Dark Chocolate	1 oz	15
Dove Chocolate	3 pieces	15
French Fries-crinkle cut frozen type	10	15
French Fries-diner style	Side order	60
French Fries-fast food	Small order	30
Graham Cracker	3 squares	15
Granola: SEE LABEL	½ cups	15-45
Hershey Kisses	5	15
Ice Cream- No Sugar Added	½ cup	12-15
Ice Cream- plain vanilla	½ cup	15
Jello	½ cup	20
Jello-Sugar Free	½ cup	0
Oyster Crackers	½ cup	15
Popcorn	3 cups	15
Potato Chips	10 chips	17
Pretzels	11 small/ 30 sticks	15
Pudding-Regular	1 snack pack	30
Pudding-Sugar Free	1 snack pack	15
Saltine Crackers	7 squares	15
Sherbet	½ cup	30
Sorbet	½ cup	35-40
Tortilla chips, baked	6 chips	15
Sugar, syrup, honey, molasses, chocolate syrup	1 Tbsp (15ml)	14

Jam, jelly, marmalade	1 Tbsp (15 ml)	13
Candies, Hard	5 small	15
Candies, Licorice	2 pieces	15
Candies, Jellybeans	5 large	13
Candies, Lifesavers	6	15

9. Milk & Yogurt	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Cow's milk (fat-free, 1%, 2%, Whole)	1 Cup	12
Rice Milk- flavored	1 Cup	See label
Rice Milk-Plain	1 Cup	20
Soy Milk (flavored-vanilla, chocolate, etc)	1 Cup	See label
Soy Milk (plain)	1 Cup	8
Yogurt (plain)	1 Cup	12
Yogurt- Dannon Light & Fit	1 serving (6oz)	10
Yogurt-Yoplait Light (blue top)	1 serving (6 oz)	19

10. Fruit	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Apple	1 small	12
Apple	1 medium	16
Apple Sauce	½ cup	12
Apricot	4	13
Banana	1 small	20
Banana	1 large	30
Berries:		
• Blackberries	2 cups	12
• Boysenberry	2 cups	17
• Cranberry	2 cups	17
• Raspberry	2 cups	13
• Strawberry	2 cups	16
• Gooseberry	2 cups	18
• Blueberry	2 cups	22
Cherries	1 cup with pits	16
Dates	2 med	12
Figs	2 small	13
Grapefruit	1 small (240g) or 1 cup	21
Grapes (red/green)	12 cup or 15	14
Guava	3 fruit	15
Kiwi	2 medium	18

Kumquat	8 fruit	14
Lemon whole	2 medium	
Lime, whole	3	16
Mango	½ medium	16
Orange	1 medium	12
Nectarine	1 large	12
Watermelon	1 cup	11
Honeydew	1 cup	14
Cantaloupe	1 cup	12
Peach	1 large	13
Pear	1 medium	20
Pineapple	¾ cup	13
Dried Fruit		
Raisins	2 tbsp	14
Banana chips	1 oz/28g	14
Cranberries	3 tbsp	17
Dates	20g	11
Coconut: raw	3 cup	16
Coconut: sweetened	½ cup	17-21
Coconut: unsweetened	2 cups	14

11. Fruit/ Vegetable Juice	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Apple Juice 100%	½ Cup	15
Carrot Juice	1 Cup	12
Cranberry Juice Cocktail 100%	½ Cup	12
Cranberry Juice Cocktail- Light	1 Cup	10
Grape Juice 100%	½ Cup (4 oz)	15
Orange Juice	½ Cup	13
Tomato or V8 juice	1 Cup (80z)	10

12. Sauce/ Condiments	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Apple Butter	2 Tbsp	15
Barbeque Sauce BBQ	2 Tbsp	15
Cranberry Sauce-jellied	¼ cup	25
Fat Free Mayo/Salad Dressing	2 Tbsp	5
Fruit Jam or Jelly	1 Tbsp	15
Fruit Spread- Jam- 100% Fruit-less sugar	1 Tbsp	10
Fruit Spread-Jams-Sugar Free	1 Tbsp	5
Gravy-brown prepared from mix	1 Cup	15
Hoisin Sauce	2 Tbsp	15

Hollandaise Sauce made from mix	2 Tbsp	5
Honey	1 Tbsp	15
Honey Mustard	2 Tbsp	7
Ketchup	¼ cup	15
Marinara Sauce	½ cup	15
Plum Sauce	2 Tbsp	15
Ranch- fat free	2 Tbsp	8
Ranch- regular	2 Tbsp	2
Sloppy Joe Sauce	¼ cup	15
Sugar	1 Tbsp	15
Sweet and Sour Sauce	2-3 Tbsp	15
Syrup	1 Tbsp	15
Syrup- Lite	2 Tbsp	15
Szechuan sauce	1/3 cup	15

13. Combination Foods	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Bean Soup (split pea, lentil, etc)	1 Cup	30
Beans & Cheese Burrito- avg frozen type	6 oz	45-60
Cabbage Roll with meat and rice	1 avg roll	15
Chicken Noodle Soup- from can	1 Cup	15
Chili with beans & meat	1 Cup	25
Chili-vegetarian	1 Cup	30-50
Cream Soup	1 Cup	15
Dumpling- Chinese type	3	15-20
Egg Roll	1 avg roll	15-25
Lasagna from restaurant	Avg serving	50-80
Macaroni & Cheese	1 Cup	45
Pizza (individual pan)	1 whole pizza	75
Pizza 12"	1 avg slice	30
Pot pie (small frozen)	1	30
Red Beans & Rice	1 Cup	45
Spaghetti with Tomato Sauce	1 Cup	45
Tuna Noodle Casserole	1 Cup	30

14. Restaurant and Take Out	Serving Size	Carbs (g) (netCarb = total carb-fiber)
Starbucks		
Banana Chocolate Chip Muffin	1	55
Bear Claw	1	62
Banana Loaf	1	63

Blueberry Bar	1	50
Blueberry Scone	1	61
Butter Croissant	1	25
Buttermilk blueberry muffin	1	50
Chocolate brioche	1	40
Chocolate caramel pretzel	1	34
Chocolate chip cookie	1	62
Cinnamon brioche	1	52
Double chocolate brownie	1	49
Everything Bagel with cheese	1	56
Fruit and Oat cookie	1	61
Lemon Cranberry scone	1	66
Lemon Loaf	1	57
Marshmallow dream bar	1	43
Multigrain bagel	1	60
Oat Bar	1	43
Oat Fudge Bar	1	56
Pain au chocolate	1	25
Peanut butter cookie	1	48
Raisin bran muffin	1	54
Reduced fat banana chocolate chip coffee cake	1	65
Reduced fat cinnamon swirl coffee cake	1	62
Savory cheese croissant	1	24
Sesame bagel	1	59
White Chocolate macadamia cookie	1	57
Cheese and fruit bistro box	1	39
Protein box	1	37
Thai style peanut chicken wrap	1	52
Bacon and gouda breakfast sandwich	1	30
Classic whole grain oatmeal	1	28
Double smoke bacon cheddar and egg sandwich	1	44
Egg and Cheddar breakfast sandwich	1	27
Reduced fat turkey bacon Sandwich	1	28
Sausage and Cheddar sandwich	1	41
Spinach and feta wrap	1	33
Birthday cake pop	1	22
Chocolate cake pop	1	21
Salted caramel cake pop	1	25
Fruit parfait – fresh berries and honey	1	37
Fruit parfait – fresh strawberries	1	34

DRINKS		
Caffe Latte Non-fat Milk or 2%	Tall	15
Caffe Latte with Soymilk	Tall	9
Caffe Latte Non-fat Milk or 2%	Grande	19
Caffee latte with Soymilk	Grande	12
Caffee Mocha without Whipped Cream	Tall	31
Caffee Mocha without Whipped Cream	Grande	41
Vanilla Latte (or other flavoured Lattee)	Tall	28
Vanilla Latte	Grande	37
Frappuccino (Plain)	Tall	36
Frappuccino (Plain)	Grande	51
Frappuccino (Plain)	Vente	70
Vanilla Bean Frappuccino	Tall	39
Vanilla Bean Frappuccino	Grande	56
Vanilla Bean Frappuccino	Vente	73

Low Carb, High Protein Food Options

Fish and Seafood	Serving	Protein	Net Carbohydrates
Fish fillets or steaks cooked (Salmon, halibut, haddock, trout etc).	3.5 oz	22g (or 6g per ounce)	Zero.
Tuna (canned)	150g tin	33g	Zero.
Salmon (canned)	150g tin	35g	Zero.
Shrimp and other shell fish (crab, lobster, prawn, muscle, oyster etc.)	3 oz	17-20g	Zero.

Poultry	Serving	Protein	Net Carbohydrates
Chicken or turkey breast	3.5oz	30g	Zero.
Chicken or turkey thigh	Average size	10g	Zero.
Chicken or turkey ground	½ cup	35g	Zero

Beef	Serving	Protein	Net Carbohydrates
Hamburger patty (ground beef)	4oz	28g	Zero.
Steak	6oz	42g	Zero.

Pork	Serving	Protein	Net Carbohydrates
Pork chop	Average size	22g	Zero.
Pork loin or tenderloin	4oz	29g	Zero.
Ham	3oz	19g	Zero.
Bacon	1 slice	3g	Zero.
Canadian-style back bacon	1 slice	5g	Zero.

Eggs and Dairy	Serving	Protein	Net Carbohydrates
Egg	1 large	6g	Zero.
Cottage Cheese	1 cup	23g	7g
Liberte Plain Greek Yogurt	¾ cup	10g	5g
Soft cheese (mozzarella, brie, feta, goat, camembert)	1oz	6g	Zero.
Medium cheeses (cheddar, swiss)	1oz	7-8g	Zero.
Hard cheeses (parmesan)	1oz	10g	Zero.

Non Dairy Milk Alternatives	Serving	Protein	Net Carbohydrates
Unsweetened Almond Milk	1 cup	1g	1g
Unsweetened Soy Milk	1 cup	7g	2g
Unsweetened Cashew Milk	1 cup	0g	1g
Unsweetened Coconut Milk	1 cup	0g	1g

Beans/Lentils & Soy			
Soybeans	1 cup	29g	7g
Tofu	½ cup	10g	1g
Split peas	½ cup	16g	12g
Beans (black, chickpeas, lentils, pinto, kidney etc.)	½ cup	15g	12g
Tempeh	½ cup	15g	8g

Nuts and Seeds	Serving	Protein	Net Carbohydrates
Natural Peanut Butter (unsweetened)	1 tbsp	5g	2g
Almond Butter (unsweetened)	1 tbsp	2g	2g
Almonds	¼ cup	8g	4g
Peanuts	¼ cup	4g	2g
Pecans	¼ cup	2g	1g
Walnuts	¼ cup	5g	2g
Sunflower Seeds	¼ cup	7g	4g
Pumpkin Seeds	¼ cup	7g	3g
Hemp Seeds	3 tbsp	10g	1g
Chia Seeds	3 tbsp	9g	Zero.
Flax Seeds	3 tbsp	9g	9g

Tricks and Tips for Choosing the Lowest Carb Vegetables

Trying to choose the low carb option can be overwhelming when you are first learning to carb count and especially if you are trying to find the “hidden” sugars in vegetables. Most non-starchy vegetables have high fibre which translates to low net carbs (usually less than 5 net carbs for a half cup of vegetables). However, some vegetables are loaded with natural sugars so we should be aware of these ones. Follow these few easy tricks to help you identify the lowest carb vegetable options if you don't have a carb counter nearby.

Think of vegetables as falling into one of four groups depending on what part of the vegetables they came from: **leaves, stems & flowers, fruit and roots.**

Leaves (Close to zero net carbs per ½ cup)

The small amount of carbs in these vegetables are wrapped in so much fibre that there virtually no impact on blood sugar when digested. These foods are usually very deep in colour (usually dark green) and are very rich in phytonutrients, vitamins and minerals.

Examples: lettuce, kale, spinach, cabbage, swiss chard, bok choy, herbs.

Stems and Flowers (Between zero and five grams of net carbs per ½ cup)

These vegetables are similar to the “leaves” group. Most of the carbohydrate found in this group is fibre. This helps to keep the carb count low in these vegetables as well.

Examples: asparagus, cauliflower, broccoli, celery and mushrooms.

Fruit (Moderate Carbs: Between five and fifteen grams of net carbs per ½ cup)

The part of the plant which contains seeds is called the “fruit.” Although we label the sweeter ones as fruit, technically, if they have seeds, they are all fruit. These tend to taste a bit sweeter and also have a slightly higher net carbohydrate count.

Examples: peppers, squashes, green beans, tomatoes, okra, and eggplant.

Note: *Avocado is also a fruit, but is lower in carbs than the others.*

Root Vegetables (Very high carb: Usually above fifteen grams of carbs per ½ cup)

These are the vegetables that are grown underground. They tend to be starchier and sweeter and therefore higher in natural sugars.

Examples: parsnips, water chestnuts, potatoes, sweet potatoes and yams.

Note: *jicama, radishes, celery root and carrots are roots, however are lower in carbs than the previously mentioned root vegetables.*

MY HEALTH PLAN: WHAT IS YOUR WHY?

Weight loss is important to you. It is not just how much you want to lose weight that drives us forward, or makes us more successful. It is figuring out our WHY? Why do you want to lose weight? Most people want to be healthy; if your answer was health, then we need to go deeper... Why would being healthier be important to you? Being healthier for someone? Being healthier so that you can do the things you want to do and feel good doing it? We need to be specific about what those things are. When you know your WHY, it helps us reset when we fall off, it helps us stay focused, it helps us make daily decisions that move us towards our goal. We can easily get distracted from our goals when life get busy, or stressful. That's normal coping behaviors. Our energies go into what is happening now. When we have strong drivers to propel us forward and help us get back on track, we move towards our goal.

WHAT IS YOUR *WHY*?

Who in life is it important that you be healthy for? Why?

- Yourself
- Partner/Spouse
- Child
- Parent
- Grandchild
- Pet
- People at Work

NAME THEM:

What are the things you want to do and feel good doing it?

- Maintain living independently
- Maintain your house
- Stay financially sound
- Travel
- Retirement
- Take care of others – grandchild, spouse, aging parent
- Garden
- Play sports or participate in other physical activities – golf, ski, hike, cycle, etc.

NAME THEM:

What are the things you want to prevent if you stayed at this weight or even gained weight?

- Depression
- Joint deterioration
- Diabetes progression to organ damage
- Heart disease
- Disability
- Ability to self-care

NAME THEM:

When we look at HEALTH and what it means to be healthy, it helps to look at it through different branches on the same HEALTH tree, so to speak. These branches do interconnect with each other, they are not in isolation but we can break down some of our health goals into these different branches

Fitness

- being able to physically do the things you want to do
- feeling physically fit and strong
- injury prevention
- weight maintenance
- disease prevention (heart disease, DM, dementia, osteoporosis)
- chronic disease management – arthritis, FM,

Diet/Nutrition

- following nutrition plan that is RIGHT FOR YOU
- planning ahead and preparation
- diet filled with vegetables, healthy proteins, healthy fats
- cutting out the ‘crap’
- limiting treats to ‘treats’

- limiting night time snacking
- limiting alcohol

Emotional Wellness

- body image
- self- confidence
- coping with daily stress
- coping with major life stressors
- balance between caring for others and caring for self
- Social support
- Understanding and recognition of emotional triggers
- Prevention of reacting negatively to those emotional triggers
- Cognitive restructuring – changing the way you think
- Problem solving
- Stimulus control
- Managing depression and/or anxiety

Notice that weight loss was not anywhere on these lists of ideas. It is WHAT WE CAN DO, WHO WE DO IT FOR, and WHAT WE GAIN or NOT LOSE because we weigh less than we do right now.

Setting weight loss as a goal, or X number of pounds weight loss can turn into an empty goal. When we have obesity, it is more than a math equation, more than calories in vs. calories out, more than a formula that myfitnesspal uses, that determines if our bodies are going to hold on to stored energy or allow it to be used or blown off. Some months, you can work really hard at food choices, restrict your carbs, or calories, or alcohol, or sugar drinks, decrease your snacks, and increase your exercise and STILL THE SCALE DOES NOT CHANGE. If our goal is to simply lose weight, we are going to be devastated. We will feel let down. BUT instead, if our goal is to change our behaviors for the long run, as these lifestyle behaviors drive us towards our goals, towards our WHY, then we are successful, no matter if the scale changes or not. It is the PROCESS, the behaviors that we do, and keep doing that help us achieve that weight loss, or prevent weight gain that we need to focus on.

By just losing 5-10% of our body weight, we will:

- 58% reduction in the risk of developing type 2 diabetes
- Improved glycemic control
 - -0.5% reduction in A1C
 - -1.1 mmol/L reduction in fasting blood glucose
- Reduced blood pressure
- Reduced cholesterol levels
- 30% decrease in sleep apnea symptoms
 - Reduced frequency of sleep apnea, improved sleep quality and reduced daytime somnolence

- Improved Quality of Life in obesity, particularly physical aspects
- Alleviated osteoarthritis, and back and joint pain
- Improved lung function and breathlessness

LIST YOUR GOALS

FITNESS/PHYSICAL CAPABILITIES	DIET/NUTRITION	EMOTIONAL WELLNESS

Identification of strengths and vulnerabilities

Why is it so hard to get and stay motivated?

Finding the motivation, energy and – dare we say – the enthusiasm, required to implement ONGOING healthy lifestyle changes is not easy. This is in large part because obesity requires self-treatment, *continual* monitoring and management, self-evaluation, reflection and constant re-focusing. We are in need of forming new habits; day in, day out - we need to make sure that we food diary, count carbs, take medication, exercise despite business of life, despite fatigue, and in some cases, despite pain. No wonder we get exhausted and burn out. ***How do we keep going?***

Identification of Strengths and Vulnerabilities

Most of us have been on diets before. For most people, that history is EXTENSIVE. We might have considered all these a failure, but let's actually consider that previous dieting experience a strength that can be built upon. By looking at what DID work, and why? As well as what challenged us and why? Or, why unable to continue? Knowing our strengths and vulnerabilities will help us to set a game plan and help us to move forward. It helps us know what the playing field and rules of the game look like. Trips are always more successful if you know the route, if you have a map, have tools to navigate the obstacles and even better – to see them coming. Although we cannot always avoid the pitfalls, our experiences can help us to navigate out of them. You have done it before.....If you have dieted for decades, even if you have not been as successful as you would have liked to be, view this as a strength. What other goal have you been so relentless at trying over and over again, despite perceived failure? (***That's tenacity. That is a strength.***)

Once you have a blueprint for change we will take a look at the road ahead. How do you take what you've learned about yourself, about your past dieting history and make some meaningful steps toward long standing change? It is through trial and error, action planning and evaluating, resetting and regrouping.

GROWTH MINDSET

Having a growth-mindset towards our vulnerabilities will help you to continue to work at them. It is never a fixed-state that we continue to repeat our mistakes or that we will never overcome. For example, it is not fixed that you CANNOT eat healthy despite high stress, business at work; or that you CANNOT exercise when life is too busy; or that when stressful situations happen we emotionally turn to food, etc. etc. We grow through making mistakes, through trial and error. What if we turned that fixed state into growth? What if we turned that eating healthy *sometimes* despite high stress or business, or emotional eating into *sometimes* I can emotionally eat but *sometimes* I turn to other coping skills to work with my emotions.

Instead of ALWAYS, or NEVER or CANNOT into only SOMETIMES or NOT YET. Let's turn the ALL or NOTHING, into SOMETHING. Having a "not yet" mindset perpetuates that we can grow and change. It turns "I emotionally eat" into "I am working not turning to food when I am upset... I am not there 'yet' but I am working on it. We must strive for progress, not perfection.

It is through **TENACITY and RESILIENCE** that we will achieve progress.

Diets/lifestyle changes tried in the past	How much weight did you lose?	Why do you think it was working?	Did you feel better while doing it?	What tripped you up? (Why did it not work?, or why did you stop?)

Once you have figured out what your area of vulnerabilities are, now what?

Our biggest concern will be not to repeat the same mistakes, over and over. Or set yet another goal and not accomplish it.... One more diet....We want to get off the dieting roller coaster....Instead of asking yourself, **why** do I do that? Ask yourself **what** can I do?

Ask WHAT not WHY?

Most times we know why we get derailed. We know that we were too busy, or stress at work was high, or that family was sick...something always gets in our way. We can't stop life from happening while we work on changing our lifestyle and habits. Figuring out *what to do about them* gives you a plan of attack.

Why?	What?
Why do I have not have control over certain foods?	<u>What</u> can I do with foods that have "power over me"?
Why do I eat when I am upset?	<u>What</u> can I do to prevent me from turning to food when I am upset?
Why can't I go exercise regularly after work?	<u>What</u> can I do to set up my schedule to allow me to exercise after work?
Why do I give up on my diet after a month in?	<u>What</u> can I do to prevent me from falling off my plan?

These are just some examples. Create a list of your own areas of vulnerabilities and ask, **What can I do about them?**

Why do I.....? (List area of vulnerability)	Why do I.....? (List area of vulnerability)

(List area of vulnerability)	Why do I.....? (List area of vulnerability)

Areas of Strength

Listing our strengths is not an easy task. We have often used fear and negative self-talk to drive us towards change. We worry that if we are happy with ourselves that we might end up just staying where we are and not changing. But in fact, research tells us that negative, fear-based drivers do not effect positive outcomes. The coach who yells, screams, berates and shames their players will just end up having their players quit. The kids would shut down. Why do that to yourself? Play to your strengths, work on your vulnerabilities – that’s how we grow. In order for you to use your strengths, we must recognize them.

Area of Strength	How have you seen this at work?	How did this make you feel?
Tenacity	I keep trying to lose weight	Hopeful
I am a planner – I like to plan	I organize my kids’ and family’s schedule and financial budget	Less anxiety, more in control

Self-Acceptance

Whatever your weight loss plan is, we will encourage you to work at self –acceptance. It may be more difficult not to get invested in weight loss as your means of feeling better about yourself, but **health** also includes emotional wellness. If you have been struggling with dieting for a very long time, our relationship with the scale has been a huge barometer of ‘how well we are doing’. Success in the long term will depend on your ability to accept yourself regardless of changes in your weight.

IMPACT OF WEIGHT WORKSHEET

For each life area below, consider the impact of your weight and body image concerns. You may feel that only a few boxes apply to you; if so, that’s okay.

Life Area	How does your weight physically limit you in this area?	How do body image concerns affect this area of your life?	How would this be different if your weight changed?
Self-Worth			
Family Life			
Romantic Relationships			
Work Life			
Leisure Activities			

Social Life			
Finances			

GETTING BACK ON TRACK

Derailment is a big part of the weight loss process. Changing your lifestyle long term requires a lot of growth, learning and adaptive change.

You are going to have bad days, bad weeks, bad months, and difficult seasons of your life that will lead to derailment or falling off track. In some cases we do not even know how we fell off track – we can go on vacation, reward good behavior, somehow get out of our routine and we resort back to old behaviors that we worked so hard at changing.

We find comfort in our old habits. In the past, our coping strategies provided us with a safe comforting place. Working at changing some of those behaviors in order to establish a “new normal” is hard work and takes time.

The issue with the new normal is that it lacks the wealth of experience that our “old normal” had. In order to establish the new normal we must make mistakes, fall, get back up and then fall again. The more we practice changing our behaviors, the better at changing them we become.

What to do?

1. Resist the temptation for a quick fix to get back on track. Instead reflect upon the situation and the triggers that allowed you to fall off track in the first place.
2. Retrace your steps. Approach this setback from a place of positivity and allow yourself forgiveness for the fall so that you can move forward.
3. Never doubt your abilities to move forward and regardless of what happens, NEVER GIVE UP.

Learning what your default behaviors are will help you develop strategies and plans for those vulnerable times/areas of your life that derail you from consistent lifestyle change.

1. Gauge where you are in your derailment – are you ready to start back? Are you still in the middle of your very stressful event/time? If so, then choose one thing you can do – one thing you did before and something that you know you can do and just do that. Make it small. Put one foot forward. It doesn't even have to be your “best foot” forward – just *a foot*. Make a list of behaviors that you still do that you are proud of. Something that you never did do before and despite your current status, you are still doing.

Behaviors that have stayed despite my derailment	Behaviors that I was doing but stopped when I fell off track

2. If you are ready to embark on getting back on track, start back at the beginning. Everyone deserves a “do over”. Get back to basics: keep a food diary, exercise for 20 minutes daily etc. What worked for you before? One small change or one small step is all you need to get a win.

List some possible options for your *one thing* that you feel you could do?

3. Derailments tend to happen during times of stress, or in times of change from our routine. It is helpful to have a guideline, or set of rules, that you follow in times of stress, crisis or upheaval in schedule or whatever your version of hurricane Katrina is happening. We call these our bare minimums.

List 3 bare minimum behaviors that you would like to see become your default behaviors – these are your baseline behaviors or basic rules that you follow *even if* _____ or despite _____ (your version of Hurricane Katrina).

Examples:

Protein based breakfast daily

Food diary

No potato chips in the house

30 minute walk three times per week

Bare Minimum Behavior Rules that I will follow <i>Even If</i>
1.
2.
3.

4. Pick up where you left off. What were you doing, exercise-wise and food-wise when disaster struck? Were you exercising forty-five minutes every day? Were you off sugar drinks entirely? This is definitely a harder option to entertain, and many people prefer to start back again slowly. That being said you may want to see if you can realistically pick up where you left off. Write out a list of behaviors that you felt were positive ones:

Positive Behaviors

5. Retrace your steps and use the tools that worked for you. This is key. What are your tools that helped you be successful in the past? Return to what works for you.

Positive Behavior	What tools did you use that helped you accomplish this behavior

Planning for future setbacks:

The key here is to remember that you learned something and you know what you can do directly next time. Set backs can be very powerful in a positive way if we learn to use their teachings.

Feeling like you are back at the beginning? ***By no means are you there!***

1. Look at what you did accomplish
2. What did it take?
3. What wins did you achieve?
4. How did you do it?

Establish a plan for when you get derailed – develop a rescue plan so to speak.

If you find you are slipping back to old behaviors – RED FLAG! Come up with a plan. In order to come up with a plan, ask yourself what would do differently next time?

Areas of Vulnerability	What can I do?
<p>Example: End of school year – Report cards and finals</p>	<p>Bring my lunch On line shop Saturday and have delivered Sunday Allow 2 treat meal per week – Friday night and Saturday Exercise 30 minutes bare minimum - even if it is just a walk Avoid trigger/comfort foods at home pizza, ice cream, potato chips</p>

The New York Times

By GINA KOLATA

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After Weight-Loss Surgery, a Year of Joys and Disappointments

Even as the pounds fell away and their health improved, two patients contended with the feeling that life hadn't changed as much as they'd hoped.

By GINA KOLATA

DECEMBER 27, 2016

It was Oct. 11, 2015, and a middle-aged man and a young woman, both severely obese, were struggling with the same lump-in-the-throat feeling. The next day they were going to have an irreversible operation. Were they on the threshold of a new beginning or a terrible mistake?

They were strangers, scheduled for back-to-back bariatric surgery at the University of Michigan with the same doctor. He would cut away most of their stomachs and reroute their small intestines. They were almost certain to lose much of their excess weight. But despite the drastic surgery, their doctor told them it was unlikely that they would ever be thin.

Nearly 200,000 Americans have bariatric surgery each year. Yet far more — an estimated 24 million — are heavy enough to qualify for the operation, and many of them are struggling with whether to have such a radical treatment, the only one that leads to profound and lasting weight loss for virtually everyone who has it.

Most people believe that the operation simply forces people to eat less by making their stomachs smaller, but scientists have discovered that it actually causes profound changes in patients' physiology, altering the activity of thousands of genes in the human body as well as the complex hormonal signaling from the gut to the brain.

It often leads to astonishing changes in the way things taste, making cravings for a rich slice of chocolate cake or a bag of White Castle hamburgers simply vanish. Those who have the surgery naturally settle at a lower weight.

Over the last year, I followed Keith Oleszkowicz and Jessica Shapiro — a computer programmer and a college student — from their surgeries through the transformations that followed. The operation, increasingly common as obesity threatens the health of millions of Americans, changes not just the bodies of those who have it, but also their lives: how they see themselves and how they relate to their romantic partners, co-workers and families.

As the pounds fell away in a society that harshly judges fat people, Keith and Jessica, two ordinary Americans, would go through an extraordinary experience, one that brought both joys and disappointments.

Jessica, 22, lived with her mother and grandmother in Ann Arbor, Mich., and worked at Panera Bread preparing food. At 5-foot-3 and 295 pounds, she had a difficult life. She needed a seatbelt extender on airplanes. She was unable to cross her legs. She had acid reflux and mild sleep apnea, which meant she woke up at night about seven times an hour.

A doctor told her something that shook her: “You are only 22, but your body is much older than you are.”

Even worse were the constant struggles of being fat in today’s society. She never had a date and no man ever seemed interested in her. Total strangers lectured her on how to eat. And she suffered unexpected humiliations, like when she went to an amusement park with friends and the ride attendant pulled her aside and asked her to try pulling the safety bar over her stomach. It didn’t fit, and he turned her away.

“Every day of my life, I’m just aware of how overweight I am,” she told me as she sipped a cup of water at a Starbucks near her home.

She tried programs like Weight Watchers, but her urge to eat, as powerful as the urge to breathe when holding your breath, defeated her. It is a drive, obesity researchers say, that people who have never felt it find hard to fathom.

“It’s like a physical need,” Jessica said. “It’s not just a longing or just a passing urge.” It is, she said, “like a kind of hunger that like kind of claws at you from the inside out.”

The surgery, she said, “is a last resort for me.”

Keith’s circumstances were a bit different. He was 40, married with a teenage son, and worked as a programmer at a big automaker. His wife, Christa, had had the operation two years before, after pondering it for nine years. She lost 143 pounds and felt that her life had been transformed.

Keith’s older brother had had the surgery, too, 16 years earlier, at a time when many doctors were splitting patients open instead of doing the surgery laparoscopically as they do today. The complication rate was much higher at that time, and the death rate at one year after surgery was 4.6 percent, verging on unacceptable.

“We were not in a good place then,” Dr. Amir Ghaferi, a bariatric surgeon at the University of Michigan, told me. The one-year mortality rate today is 0.1 percent, safer than gallbladder surgery or a joint replacement.

Keith, at 5-foot-9 and 377 pounds, was not as fat as his brother had been, but he was having physical and medical problems. He somewhat hesitantly listed some of them: His joints hurt;

moving around was an effort; he could not bend down to tie his shoes; he had sleep apnea and had to use a continuous positive airway pressure machine to push air into his lungs when he slept; he had high blood pressure.

He had lost 10, 20, 30, even 40 pounds at a time over the years with various diets, but he was plagued with insatiable urges to eat. The weight always came back.

“I’ve tried everything I can,” Keith said.

But, he stressed, it is not as hard for a guy to be fat as it is for a woman. And he’s right. Researchers have found that there is more prejudice against fat women than against fat men. Still, Keith suffered many indignities.

As a child, he was teased and became so ashamed of his body that he could not bring himself to undress for gym class. So he wore his shorts and T-shirt under his school clothes and spent the rest of the day with those sweaty clothes underneath. He even had his own amusement park moment, at the same place, Cedar Point in Ohio, where Jessica had been embarrassed.

Yet he had a hard time committing to the surgery. It was such a big step, and once it was done, there was no going back.

In the end, it was Keith’s son who tipped the balance. “I don’t want you to die, Dad,” he told him one day when the two were playing video games. He looked up at Keith, saying, “Dad, we need to do something.”

The Operation

By the day of their surgeries, Oct. 12, 2015, Jessica and Keith had spent months preparing.

They had had medical and psychological tests. They went to counseling and mandatory sessions explaining what was going to happen, and what to expect and how to eat afterward.

They learned that the gastric bypass operation both had chosen (it and a procedure called the gastric sleeve are the two main options) leaves patients unable to absorb some vitamins and minerals. They would need to take supplements daily for the rest of their lives. And because the rearranged digestive tracts can dump sugar into the bloodstream too quickly, they would have to be careful about sugar intake or risk “dumping syndrome,” which can cause vomiting, sweating and shakiness.

For two weeks before the surgery, Jessica and Keith followed a high-protein liquid diet to shrink their livers. People with obesity often have large, fatty livers that can get in the way during the operation.

The day before, Jessica stood at her kitchen counter preparing a mango protein shake with mango flavored Crystal Light and protein powder. It smelled foul. She forced herself to swallow it.

“I am excited,” she said.

At 6:30 the next morning, a nurse and a surgical resident wheeled Jessica into an operating room on a special wide gurney. They slid her onto an operating table that was set as low as it could go because bariatric patients’ abdomens rise high, as if they were domes.

The surgeon, Dr. Oliver Varban, started by inflating Jessica’s abdomen with carbon dioxide to give him more room to work. Then he made seven small holes in her skin and inserted his equipment, including a cylindrical tube containing a tiny light to illuminate her abdominal cavity, lenses, mirrors and a tiny camera to project the scene on a computer monitor above Jessica’s head. The screen showed gleaming golden bubbles of fat that were surprisingly beautiful.

Dr. Varban used what looked like a miniature table tennis paddle to push Jessica’s liver aside and give him a clear view of her stomach. Her intestines were obscured by fat, so he used a special surgical grasper to gently push the fat aside.

It might seem reasonable for Dr. Varban to simply remove some of the fat from Jessica’s abdomen, but doing that, he said, would result in a bloody, hemorrhaging mess. He explained that there is a mile of blood vessels in every pound of fat.

Dr. Varban cut off most of Jessica’s pink and healthy stomach, leaving a pouch the size of an egg. He stapled and sealed the pouch with a device that looked like a saw-toothed pair of shears, leaving a shiny metallic edge of staples. Then he grabbed the top of her small intestine and attached it to the stomach pouch.

A couple of hours later, he was done and it was Keith’s turn. The operation was the same, but Keith’s fat looked different, more yellow than golden, and lumpy. And there was much more of it — his organs were buried in it. Men tend to have thicker abdominal fat, Dr. Varban said, and it is slipperier, harder to grasp with the laparoscopic instruments.

Jessica and Keith spent two nights in the hospital and then were discharged, with instructions to follow a liquid diet for a couple of weeks and then gradually add solid foods.

Jessica was surprised by the pain. When she was home, recuperating, she started to have second thoughts about the surgery. One day, she sat down and cried.

“I had like this awful buyer’s remorse,” she said. “I was like, ‘What did I do to my body?’ This is not reversible, there is no going back.”

Improving the Technique

For years, surgeons thought weight-loss operations worked because they made the stomach so small that it hardly held any food. And with the bypass operation, they made it even harder for food to be digested. Of course patients lost weight.

But some things just did not add up.

A simple surgical treatment, the gastric band, which constricts the stomach, was widely used when it was first approved in 2011 but fell out of favor because its effects on weight were variable and almost always smaller than those of the other operations. It still is used (New Jersey's governor, Chris Christie, had one), but it now accounts for just 5.7 percent of weight-loss surgeries.

At a recent meeting of Michigan bariatric surgeons, one doctor asked for a show of hands. Who in the room would refuse to do a gastric band procedure even if a patient asked for it? Just about every hand in the room went up.

"The most common operation with the band now is an operation to remove it," Dr. Varban said.

Even leaving aside the gastric band issue, the idea that the bypass and sleeve surgeries were a mechanical fix, by limiting the amount of food a patient could eat, did not seem right.

Wiring people's jaws shut would keep them from eating, noted Randy Seeley, who holds a doctorate in psychology and is a professor of surgery at the University of Michigan. But, he asked rhetorically, "If I wired your jaw shut, would you be more hungry or less hungry?"

In contrast, patients who had bypass and sleeve operations reported that they were not particularly hungry afterward, and that their incessant urges to eat vanished. Even more surprising, their taste for food often changed.

Dr. Lee Kaplan, an obesity researcher at Massachusetts General Hospital, recalled a patient who asked him: "Are you sure they didn't operate on my brain? Food does not call out to me anymore."

Another, who used to seek fatty and sugary foods, said, "I crave salads now."

Dr. Justin Dimick, a bariatric surgeon at the University of Michigan, said a woman who lost 200 pounds told him that before the operation, a Reese's peanut butter cup gave her such a rush that it was, she said, "like an orgasm of pleasure in my brain." Now, she said: "It's just peanut butter and chocolate. What's the big deal?"

Experimental data support these reports. Both patients and rodents who had surgery are actually more sensitive to the taste of sweets: Receptors on their tongues detect smaller amounts of sucrose.

The data, the patients' stories, made no sense if all surgery did was make it harder to eat, Dr. Kaplan said. Both the bypass and sleeve operations, he added, "drive the body to want to eat less."

But why?

Some, including Dr. Seeley and Dr. Kaplan, looked for answers by studying the surgeries in fat rats and mice.

“What you find very quickly is that rats and mice lose weight just the way you see in humans,” Dr. Seeley said. “It’s remarkable.” Surgery changed the weight the animals’ bodies settled into. And, as with patients, their tastes in food changed.

For example, Dr. Seeley gave some rodents the exact bariatric surgery operation that humans get while he gave others, which served as controls, sham surgery: Researchers opened the animals’ abdomens and then sewed them shut. The bariatric surgery animals lost most of their excess weight and then stabilized at a lower weight.

Then the researchers put all the rodents on a diet. All lost weight.

Three weeks later, the animals were given as much food as they wanted. Those that had had the sham operation ate until they were back to their original weights. Those that had had the real bariatric surgery ate until they reached their post-surgery weight.

“Surgeons often talk about bariatric surgery as a tool. You have to follow all these instructions,” Dr. Seeley said. It only works, they tell patients, if they follow a diet and exercise program.

“My message is that the rats don’t appear to do it that way. They don’t know it’s a tool. They just naturally change lots of things in the way they relate to food.”

Three Months Later

After plummeting soon after the operation, Jessica’s weight began to fall more slowly. By January she had lost 65 pounds.

It showed. She moved more briskly and met me wearing a black elastic belt over a loose top. “I have a waist!” she exclaimed.

Her predicted final weight is 180 pounds, based on a statewide database of nearly 70,000 bariatric operations by 80 surgeons in Michigan. Doctors use it to calculate what a person Jessica’s age and starting weight can expect to weigh a year after the operation, when nearly all the weight loss will have occurred.

But her goal is to weigh 130 or 140, and she plans to diet to get there if the surgery does not do it for her.

Almost all patients have such vows, her surgeon, Dr. Varban, says. But they rarely succeed in losing more weight and keeping it off. The surgery resets their weight at a lower level, but it is just as hard to lose more than that as it was to lose weight before the surgery.

Still, Jessica did not crave food like she used to; some days she actually forgot to eat, she said. She was not counting calories or consciously trying to diet, but the weight came off. She still got hungry but was quickly satiated.

Yet surprisingly little had changed in her life. She had returned to community college after taking a semester off and her typical day was “the same as before,” she said. “I go to school or do homework. On days I don’t have school, I sleep or stay up late and watch shows or read into the night, from midnight until 5 a.m.”

She knew she was thinner, but she said: “I feel like the change isn’t dramatic enough. I look at myself and still see fat.”

Keith had lost 80 pounds by the time I visited in January. His sleep apnea was gone; he didn’t even snore anymore. His blood pressure dropped to normal before he left the hospital and stayed normal; before surgery he had been taking two drugs to control it.

He dropped 10 pants sizes — from 58 to 48. Even his shoe size shrank. His legs and knees did not hurt anymore.

And his eating habits were transformed.

“I used to crave pizza like crazy,” he said. He doesn’t like it anymore. It’s too heavy, too greasy.

Same with White Castle hamburgers, which he used to lust after. One day, on his way home from work, he bought a bag. Somehow, they didn’t smell appetizing. He took a bite. He did not like the taste.

“I don’t have to worry about White Castle hamburgers anymore,” Keith said.

But he, too, still thinks of himself as fat.

Keith knew he should exercise, although he never liked it. On a bright winter Saturday, I went with him to the gym. He stepped onto a treadmill and started to walk, going two miles at a pace of three miles an hour, sweating at the end, breathing a bit hard. Before surgery, walking on a treadmill for one mile at a pace of two miles an hour was a huge effort. We followed the treadmill with a one-mile walk on the gym’s indoor track.

Keith did not change into workout clothes at the gym, remaining in jeans (that were now loose) and a polo shirt. When I asked him why, as we drove away, he told me it must be a remnant of his school days when he did not change for gym class. Being fat stays with him.

“I have a fat brain,” he said.

Eight Months Later

One day in June, Jessica walked into the Ann Arbor Panera Bread where she had worked before her surgery, 90 pounds thinner than her peak weight of 295 pounds. She had cut her hair short and wore a glittery black scarf as a headband.

She ordered a turkey and cheese sandwich, a kids’ yogurt and a bottle of water. She ate slowly, as though hunger were an afterthought.

As the pounds dropped, she had become a bit more daring.

She even ventured onto OkCupid, an online matchmaking site, posting a couple of selfies. She got 30 likes and a few messages. But after six hours, she deleted her account.

“It was weird and it wasn’t me,” she said. She worried when one guy wrote, “Hey, want to have fun?” Another guy, she said, “seemed all right but then he started asking about sex and things.”

Still, she said, the experience “was definitely a confidence booster.”

When I visited Keith the same weekend, he had lost 93 pounds and was down to 277. But his weight loss had stalled, and he worried because his goal was to weigh 210. He wondered if he would even reach his projected weight of 230.

But he, too, had noticed some big changes. He mulched his front yard in a day. Before surgery, he said, it would have taken a couple of weeks. His back did not ache; his knees were not sore.

Keith’s weight loss, Christa said, “has definitely changed our relationship, in a good way.” He used to slouch on the sofa when he was off from work, too tired to accompany Christa on errands. Now, she said, “if I need to go to the store, Keith says, ‘Want me to come with you?’”

On that sunny June Saturday, I accompanied Keith, Christa and their son on a trip to Zingerman’s, a famous Ann Arbor deli. Keith’s jeans, size 44, had fit when he bought them a month earlier, but they were already loose. Christa and I watched as he tried samples of soft cheeses, seeking one with just the right tang. The other customers paid no attention, a big change from the presurgery days when people could not help staring at the fat man.

Resetting the ‘Set Point’

For obesity experts, bariatric surgery is at best a compromise. What they really want is a medical treatment with the same effect — lowering the body’s set point, the weight it naturally settles into — without drastically altering the person’s digestive tract.

Ten years ago, it seemed as if it could be simple.

“We had the idea that probably surgery did several distinct things that you could figure out,” Dr. Kaplan said. “If there were 10 different mechanisms, we could find 10 drugs that could hit them.”

If only.

It has become clear that bariatric surgery changes the entire setting of a complex, interlocking system. There is no one place to tweak it. To show what is involved, Dr. Kaplan reports that surgery immediately alters the activity of more than 5,000 of the 22,000 genes in the human body.

“You have to think of it as a whole network of activity,” Dr. Kaplan said. It’s a network that responds to the environment as well as to genes, he added. Today’s environment probably pushed that network into a state that increased the set point for many people: Their brains insist on a certain amount of body fat and resist diets meant to bring them to a lower weight and keep them there.

“Surgery moves the network back,” Dr. Kaplan said.

But surgery only alters the intestinal tract. That tells you, Dr. Kaplan says, that there are whole classes of signals coming from the gut and going to the brain and that they interact to control hunger, satiety, how quickly calories are burned and how much fat is on the body.

One major hormonal change is in bile acids. There are more than 100 varieties of these hormones, which help regulate metabolism and digest foods. They send out broad signals, like television signals, to any cells in the body with the capability to respond. And the relative proportions of the different bile acids change immediately with surgery.

Neurons, which signal specific targets in the brain, change, too. And so do white blood cells of the immune system that send their own signals. Although they are usually thought of as fighting disease, white blood cells play a major role in setting a person’s weight by, among other things, helping control metabolism.

The gut’s microbiome — the thousands of strains of bacteria in the intestinal tract — changes, too, immediately and permanently. Its interaction with the rest of the network is part of the weight-loss picture.

But for bariatric surgery to work, the setting in the brain that determines how much fat a person will have — what Dr. Kaplan refers to as the body’s thermostat for fat — must have been set too high, not broken.

A few rare genetic mutations break the thermostat. People with those mutations have no internal controls on their fat and grow enormously obese. Bariatric surgery has no effect on them. People like Jessica and Keith, whose thermostats were mis-set, reach a point at which they are obese but their weight holds steady without any effort on their part. Surgery can lower their thermostat’s setting.

That simplistic notion — that there may be just a few key places to intervene in the tangled web of controls that sets a person’s weight — seems just that: simplistic.

But some nodes of the network may be more important than others. They may be the drivers.

“What we need to do is find these mechanisms,” Dr. Kaplan said.

One Year Later

This fall, Michigan surgeons gathered about 100 bariatric surgery patients into small focus groups roughly a year after their operations and asked about their new lives, expecting mostly enthusiastic reports. Yet responses were muted.

“From an outsider’s perspective — as someone who hasn’t had the operation — it is confusing,” Dr. Ghaferi said. “Why on earth wouldn’t you be ecstatic?”

There was a lot of talk about changed relationships. Some patients had divorced or separated from a spouse. Some said that a partner did not like the way they looked, or that their partner was still obese and jealous, or that the partner complained, “You’re not the person I married.”

Some believed that people would judge them for having had the surgery, so they kept the operation a secret.

Some did not like the way they looked. It was not enough weight loss, or they were not aware — although it had been part of their presurgery education sessions — that they would end up with big flaps of loose skin that could be gotten rid of only with extensive and expensive plastic surgery.

On the other side of the equation, patients raved about newfound energy and stamina, and the way joint and back pain disappeared. They loved tossing away medications for diabetes or high blood pressure.

Jessica and Keith, too, had mixed reactions.

A year after his surgery, Keith weighed 284 pounds, down from his starting weight of 377, but not at his projected weight of 230. It is increasingly unlikely that he will get there.

But he looked and felt transformed.

“Some people I haven’t seen in years don’t recognize me,” Keith said.

“And I do have more energy,” he added. “It is a huge difference.”

Yet he is still fat, and still feels big. “I expected all my weight to be gone,” Keith confessed over lunch at a sushi restaurant near his work. “I wanted to be 230. I was hoping.”

And he misses his former lust for food. “I just liked eating before. I liked to eat.”

Jessica lost 112 pounds, just about exactly what was predicted.

“I expected myself to grieve a lot more for my loss of my old relationship with food, and I didn’t,” she said.

She began classes at Eastern Michigan University in the fall but dropped out in October, explaining that she did not like the courses and had a lot of anxiety. While she waits to apply to another college, she is working at coffee shop near her home. She still lives at home.

Before her operation, she could blame her stalled life on her obesity. Now, she says, “I don’t have an excuse anymore.”

“I’m smaller,” she said. “But it’s been gradual enough that I still feel like I’m the biggest person in the room wherever I go.”

On the other hand, her acid reflux is gone and she had the confidence to buy a bike.

She wants to lose another 40 pounds. Her plan is to start with that awful liquid diet she was on for two weeks before her surgery. In the meantime, she has not bought new clothes, holding off until she loses more weight. She says she will consider having plastic surgery to remove loose skin after she loses more pounds.

Yet, Jessica says, although she has mixed feelings about the results of the surgery and although she is disappointed that her life has not changed as much as she hoped, she does not regret having the operation.

And she had some triumphs.

She went back to the amusement park where she had been so humiliated when she was turned away from a ride, too big for the safety bar to go over her.

Now she fit.

