



Bariatric and Metabolic Institute

# Bariatric Surgery for Treating Sleep Apnea



A minimally invasive approach

## Dear Friend,

If you struggle with sleep apnea and are overweight, you are not alone. More than half of Americans are overweight and roughly 12 million Americans have severe obesity (defined as being 100 pounds or more overweight). Obesity is one of the most important factors for the development of sleep apnea.

Studies have shown that bariatric surgery (also known as gastric bypass, or weight-loss surgery) is an effective tool for treating obesity, and for preventing, treating and even resolving sleep apnea.

The Bariatric and Metabolic Institute works closely with Cleveland Clinic sleep specialists to treat patients with sleep apnea and develop a program tailored to suit their needs.

Carefully researching your options is an important step in your search for the best sleep apnea and weight management program. We are confident that you will discover that the Cleveland Clinic Bariatric and Metabolic Institute excels in so many ways.

At Cleveland Clinic, you'll have easy access to many of the nation's best physicians not only in bariatrics and sleep medicine, but also in such specialties as cardiology, orthopaedics, gastroenterology and endocrinology.

Cleveland Clinic Bariatric and Metabolic Institute performs more bariatric operations than any other hospital in Ohio and is an ideal setting for bariatric surgery. When you come to Cleveland Clinic, ranked among the nation's top hospitals for the last 17 years by *U.S. News & World Report*, you are assured that all of your medical care will be of the highest quality available anywhere. All of our surgeons have completed Fellowship Training in Advanced Laparoscopy and Bariatric Surgery.

Please call us with any questions. We look forward to serving you and your health needs.

Sincerely,



**Philip Schauer, MD**  
Director, Bariatric and  
Metabolic Institute



**Bipan Chand, MD**  
Advanced Laparoscopic  
and Bariatric Surgery  
Director of Surgical Endoscopy



**Stacy Brethauer, MD**  
Advanced Laparoscopic  
and Bariatric Surgery



**Matthew Kroh, MD**  
Advanced Laparoscopic  
and Bariatric Surgery



**Tomasz Rogula, MD**  
Advanced Laparoscopic  
and Bariatric Surgery



## The link between weight and sleep apnea

Obesity is one of the most important factors for the development of obstructive sleep apnea, a serious sleep disorder that involves periodic collapsing of the soft tissues of the throat during sleep that leads to temporary cessation of breathing, otherwise known as apnea. People who are obese tend to have thicker tissue around the throat that may make them prone to apnea.

During an apnea episode, the diaphragm and chest muscles work harder to open the closed airway, and large changes in blood pressure can occur as well. Breathing usually resumes with a loud gasp or body jerk. This can decrease sleep quality and may reduce the flow of oxygen to vital organs. Untreated sleep apnea is associated with an increased risk of hypertension, heart rhythm irregularities, heart attacks and strokes.

About 85 percent of people who have sleep apnea are obese. Sleep apnea occurs in about 25 percent of men and nearly 10 percent of women. The condition can affect people of all ages, but is most common in people over the age of 40 and those who are overweight.

*"Sleep apnea is a serious sleep disorder that is associated with an increased risk of heart attacks and strokes if not treated. CPAP is an effective treatment for sleep apnea, but not all patients can use CPAP for different reasons. If you are obese and have sleep apnea, losing weight with bariatric surgery can significantly improve your sleep apnea and perhaps even allow you to discontinue your CPAP." – Charles Bae, MD, Cleveland Clinic Sleep Disorders Center*

## When conventional sleep apnea treatment isn't enough

After diagnosis with an overnight sleep study, treatment should begin. Sleep apnea needs to be treated to prevent long-term complications like hypertension, stroke, arrhythmias, cardiomyopathy (enlargement of the muscle tissue of the heart), congestive heart failure, diabetes and heart attacks. In addition, its treatment also may help improve your quality of life by improving concentration and increasing energy levels. As a result, treating sleep apnea may help decrease job impairment, work-related accidents and motor vehicle crashes.

Continuous positive airway pressure (CPAP) is the preferred initial treatment for most people with obstructive sleep apnea. With CPAP, patients wear a mask (over their nose and/or mouth) that is connected to an air blower that pushes air through the nose and/or mouth.

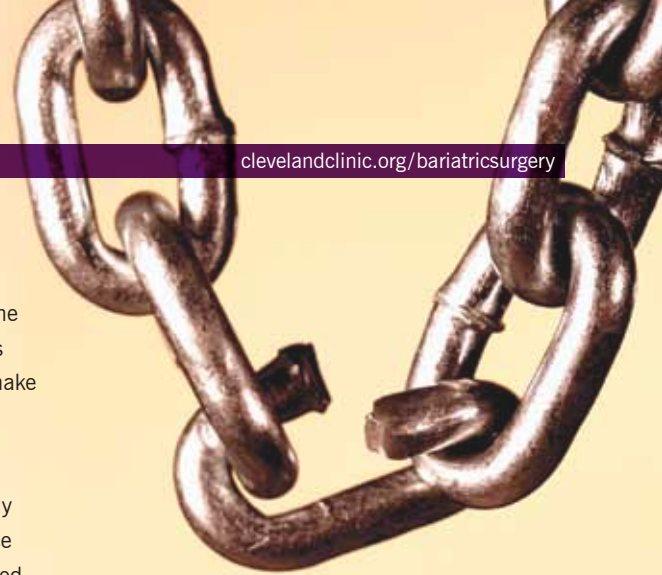


The air pressure is adjusted so that it is just enough to act as an air splint to prevent the upper airway tissues from collapsing during sleep. The air pressure is constant and continuous. CPAP prevents airway closure while in use, but it does not cure sleep apnea and apnea episodes return when CPAP is stopped or if it is used improperly. Other types of positive airway pressure devices are available for people who have difficulty tolerating CPAP.

One problem with CPAP treatment is that compliance is low, with less than 50 percent of patients actually wearing the mask and using the device regularly. When used properly, CPAP is quite effective for treating sleep apnea, however, if a patient does not use CPAP, the risk for health conditions associated with untreated sleep apnea such as hypertension, heart rhythm irregularities, heart attacks and strokes remains high.

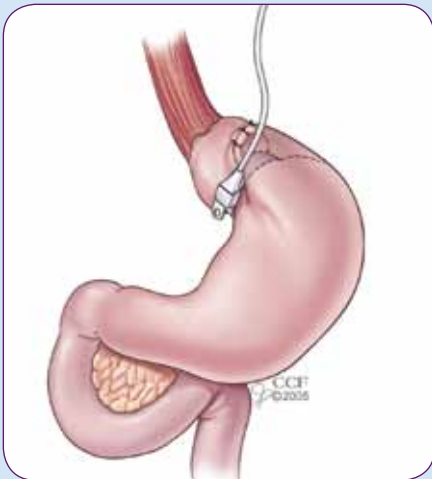
Bariatric surgery is the most effective treatment for obstructive sleep apnea, causing remission in 80 to 85 percent of cases. There are some patients who have such severe sleep apnea that CPAP helps, but doesn't completely resolve their sleep apnea.

CPAP is an effective treatment for sleep apnea, but it does not cure sleep apnea. Surgically induced weight loss can be a lasting resolution for sleep apnea.

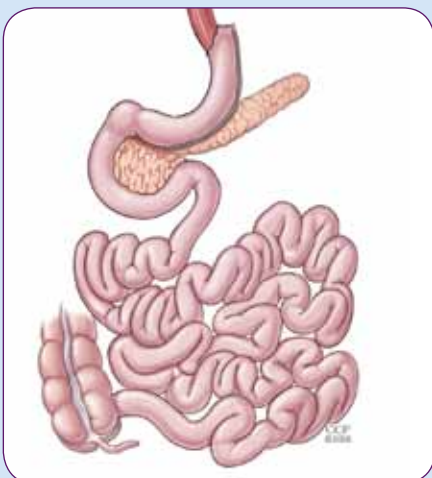




Laparoscopic Roux-en-Y Gastric Bypass



Laparoscopic Adjustable Gastric Banding



Laparoscopic Sleeve Gastrectomy

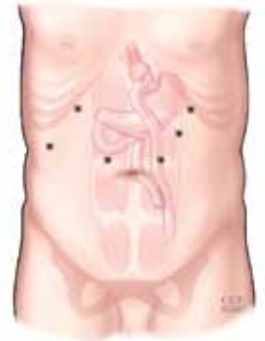
## Proven Procedures

The most common forms of bariatric surgery are Roux-en-Y gastric bypass, adjustable gastric banding and sleeve gastrectomy. Our experts will work with you to determine the procedure that is best for you.

## Minimally invasive techniques

More than 95 percent of all procedures performed at the Bariatric and Metabolic Institute are performed using minimally invasive (laparoscopic) techniques. In fact, our surgeons are pioneers in advanced laparoscopic techniques.

Minimally invasive surgery means faster operations, less anesthesia, much smaller incisions and less scarring, all of which contribute to faster healing and recovery.



### Laparoscopic Roux-en-Y Gastric Bypass

**How it works:** This procedure involves creating a small stomach pouch, so less food can be consumed. The intestine is connected to the pouch and rerouted. Food bypasses the lower stomach, the first segment of the small intestine (duodenum) and part of the second segment (jejunum). A direct connection is created from the small stomach pouch to the lower segment of the small intestine. Patients generally can return to work within three to four weeks.

### Laparoscopic Adjustable Gastric Banding (LAGB)

**How it works:** The laparoscopic adjustable gastric banding procedure involves placing an adjustable, inflatable silicone band around the upper part of the stomach. The technique restricts the amount of food that can be eaten and, when properly adjusted, controls hunger. Patients generally can return to work after two weeks. The inner balloon of the band can be incrementally inflated after surgery to increase the feeling of fullness after eating and improve hunger control. Patients generally recover quickly and return to work within one to two weeks. The disadvantages of LAGB include the need for frequent postoperative visits for band adjustments and band slippage or gastric prolapse through the band (5 to 10 percent), which would require reoperation.

### Laparoscopic Sleeve Gastrectomy

**How it works:** Laparoscopic Sleeve Gastrectomy (LSG) is a restrictive procedure that reduces the size of the stomach and limits food intake. This procedure may be used as part of a staged approach to surgical weight loss. Patients who have a very high BMI, who are at risk for undergoing anesthesia or who have a heart or lung problem and should not undergo a long surgical procedure may benefit from this staged approach.

As a stand alone procedure, there is significant evidence that sleeve gastrectomy is comparable in safety and efficacy to gastric banding. Unlike gastric banding, there is no silicone band and no return visits for adjustments are required. Patients generally can return to work within three to four weeks. Overall, the risks are similar to those seen with the laparoscopic adjustable band, but lower than the risks associated with gastric bypass.

## What you can expect to lose...and gain

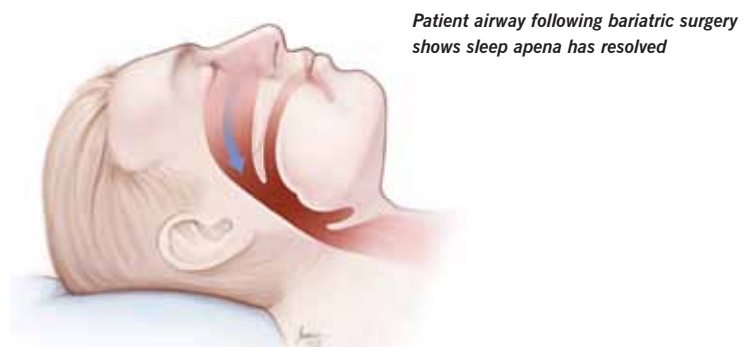
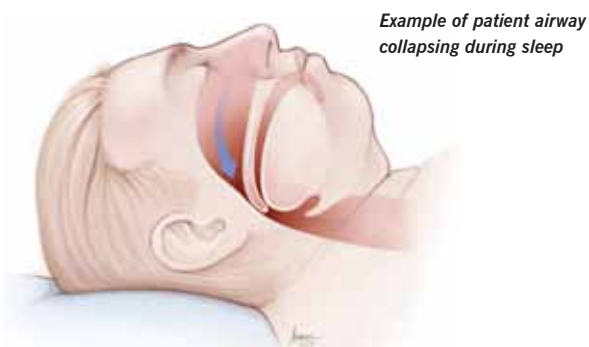
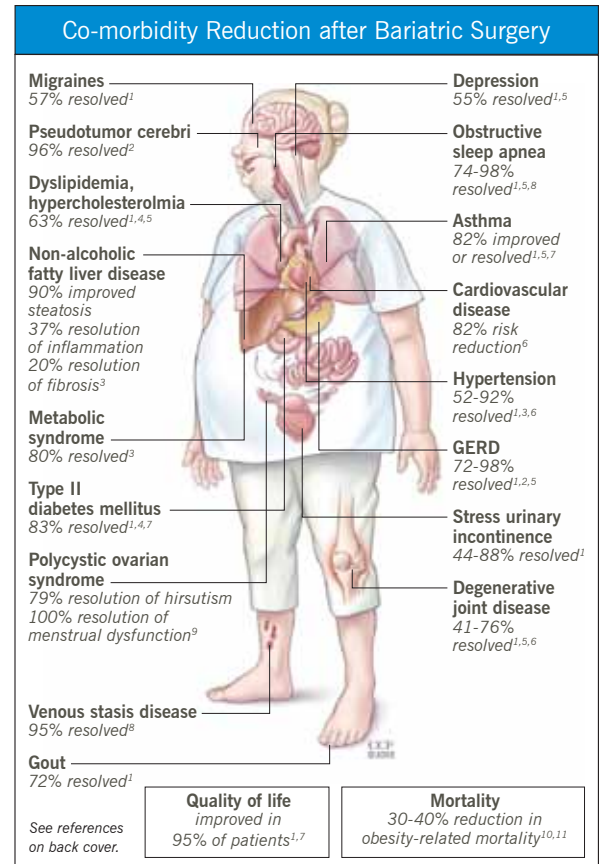
Most of our patients lose between 50 and 80 percent of their excess body weight 18 to 24 months following surgery. When patients lose weight following bariatric surgery, the fatty tissue around the upper airway is decreased which can eliminate the upper airway collapse that occurs with sleep apnea. The weight loss you achieve can only be sustained with your commitment to dietary changes and regular exercise.

After surgery, patients typically notice a significant improvement in their sleep apnea symptoms – less snoring (if/when not wearing CPAP) and less daytime sleepiness – within the first three months. By one year after surgery, about 80 to 85 percent of patients experience remission of their sleep apnea and can be weaned off their CPAP. It is critical for patients to maintain their weight loss, as regaining a significant amount of weight will likely cause sleep apnea to return.

Surgery also helps resolve related health conditions in more than 70 percent of cases. Patients also experience a 30 to 40 percent reduced chance of sleep-apnea related death.

## Effects of surgery on airway obstruction

Obese patients have a larger amount of fatty tissue around their upper airways. When they go to sleep, the muscles of the body, including the throat, relax and the surrounding weight of the soft tissue partially or completely collapses the upper airways. After surgery, reduction of surrounding fat allows the airway to open which corrects sleep apnea.



## Recovery and Support

After surgery early postoperative visits focus on potential complications and dietary changes. Diet is progressively advanced from liquid to solid food over the first month in consultation with a dietitian. Later follow-up visits focus on psychological support, nutritional assessment, vitamin supplementation and exercise programs. Monthly patient support groups cover topics such as nutrition, fitness, plastic surgery and psychosocial issues. After surgery, patients are referred back to their primary care physicians for their routine healthcare. Following up with your sleep disorders specialist also is recommended.

	1 wk	1 mo	3 mos	6 mos	9 mos	1 yr	Annually
Surgical follow-up	✓	✓	✓	✓	✓	✓	✓
Lab work				✓		✓	✓
Dietary counseling		✓	✓	as needed			
Psychological counseling		✓	as needed				
Exercise prescription			✓	as needed			
Sleep apnea evaluation					✓		



## Find out the advantages of Cleveland Clinic

The Bariatric and Metabolic Institute at Cleveland Clinic is a comprehensive program providing you with personalized attention as you work toward your goals of sleep apnea resolution and weight loss. An entire team of professionals, led by board-certified surgeons, medical weight loss specialists and endocrinologists, works to provide superior care for our patients. The team comprises professionals from many disciplines: surgeons, physicians, anesthesiologists, psychologists, specialized nurses, dietitians, coordinators and more. This team is backed by a wide range of Cleveland Clinic specialists – from sleep disorders specialists, gastroenterology/nutrition, cardiology and internal medicine – who assist in patient care before and after surgery.

Our specialists will work with your primary care physician and sleep disorders specialist, keeping in close communication with them about your course of surgery and recovery, including any special needs or medication changes as a result of weight-loss surgery.

## Are you eligible for surgery?

Bariatric surgery is major surgery, and should be considered only after non-surgical treatments for sleep apnea have proven unsuccessful or undesirable. If you're considering weight-loss surgery, you must make a serious, lifelong commitment to lifestyle changes, and follow up with your bariatric team.

Our program follows the National Institutes of Health (NIH) guidelines for patient selection. If you have a BMI (Body Mass Index) of 35 or more with sleep apnea and/or other illnesses related to excess weight, you probably are a candidate for bariatric surgery. In some cases of inadequately controlled sleep apnea, patients may be eligible for bariatric surgery even if they have a BMI of less than 35. Our center accepts candidates between the ages of 12 and 70, with some exceptions.

If you do not meet these guidelines, or we find that you are not eligible for bariatric surgery for health reasons, the Sleep Disorders Center at Cleveland Clinic can help you control your sleep apnea by utilizing the latest advancements in the field of sleep disorders.

## Every surgery has risks

All surgical procedures carry risks that must be balanced with their benefits. Your surgeon will discuss potential risks of surgery with you so you can make an educated and informed decision.



## Confidence in our program

The Cleveland Clinic Bariatric and Metabolic Institute has been named a Bariatric Surgery Center of Excellence by the American Society for Metabolic and Bariatric Surgery. We also have been accredited as a Level 1 facility by the Bariatric Surgery Center Network (BSCN) Accreditation Program of the American College of Surgeons (ACS). Additionally, several major insurance providers have designated the Bariatric and Metabolic Institute as a distinguished program, including Anthem Blue Cross Blue Shield, Aetna and Medical Mutual of Ohio.



## Information/Appointments

For more information about the Cleveland Clinic Bariatric and Metabolic Institute, visit our Web site at [clevelandclinic.org/bariatricsurgery](http://clevelandclinic.org/bariatricsurgery). You also may call 216.445.2224 or 800.CCF.CARE (223.2273), ext. 52224, or email us at [weightmanagement@ccf.org](mailto:weightmanagement@ccf.org).

**We look forward to helping you beat sleep apnea while losing weight and improving your health and longevity!**

# Is Surgery the Cure for Sleep Apnea?



## Bill Klonaris

With his weight constantly fluctuating after trying countless unsuccessful diets, Bill Klonaris turned to gastric bypass surgery in hopes of losing weight and becoming more involved with his family. Following the procedure, Bill shed more than 132 pounds – his sleep apnea resolved, no longer making him dependent on CPAP. He now enjoys a good night's sleep, without CPAP and snoring. His wife sleeps better too!

Bill Klonaris was a busy automotive industry professional, always on-the-go, turning to fast food whenever he had a break. A self-proclaimed “junk food junkie,” his weight had been a problem for years. Bill tried several fad diets that got his hopes up with their short-lived success. His wife, a vegetarian, urged him on a daily basis to eat healthier.

Because of his weight, Bill was also battling a serious case of sleep apnea, which left him feeling tired all the time. His sleep was very restless at night and his snoring was so loud that it regularly woke his wife.

Bill's doctor ordered a CPAP machine to help him breathe at night. “I wore the mask for a couple of nights,” Bill recalled. And then he boxed it up and put it in the closet. “I just couldn't face sleeping with that for the rest of my life.” But it wasn't long before Bill realized the CPAP machine was a necessity for him to sleep through the night. He began wearing it again and soon became completely dependent on it for eight years.

By 2007, Bill found himself at 316 pounds, his heaviest weight ever. “I felt like I was missing out on life,” Klonaris said, “I wanted to be a healthy, active dad while my kids were still young.” That's when he began to consider bariatric surgery at Cleveland Clinic. After a comprehensive preparation process, Bill underwent gastric bypass surgery at Cleveland Clinic on August 26th, 2008.

Today, Bill weighs in at 184 pounds and has a new outlook on life. Bill was surprised to find that as quickly as the first week after surgery, his sleep apnea symptoms had disappeared. He is no longer forced to rely on a CPAP machine to breathe. He now sleeps soundly through the night and his snoring has been eliminated. In the morning, he wakes up feeling refreshed and ready for the day ahead. “It's amazing,” Bill said. “I really feel so much better.”



## Directions to the Bariatric & Metabolic Institute

### From the South

Take I-77 or I-71 North to downtown Cleveland. I-77 and I-71 merge with I-90 East. Take I-90 East to Chester Ave. exit and turn right. Take Chester Ave. to Cleveland Clinic's main campus.\*

### From the Southeast or East

Take I-80 West to I-480 (exit 187), or take I-480 West to I-271 North (do not use express lanes) to the Cedar Rd. exit. Turn right on to Cedar Rd. Take Cedar to Carnegie Ave. (approximately eight miles). Take Carnegie Ave. west to E. 105 St. and turn right. Take E. 105 St. to Chester Ave. and turn left. Proceed to Cleveland Clinic's main campus.\*

Or take I-90 West to Martin Luther King, Jr. Dr. (MLK) exit. Turn left on to MLK. Take MLK to E. 105th St. and turn right. Take E. 105th St. to Chester Ave. and turn right. Take Chester Ave. to Cleveland Clinic's main campus.\*

### From the West

Take I-90 East to Chester Ave. exit and turn right. Follow Chester Ave. to Cleveland Clinic's main campus.\*

\* Parking is available in various garages/lots. If you are visiting a patient at the main hospital, park in Parking 1, located on E. 93rd Street between Chester and Euclid avenues. Please see map on opposite side to locate the parking garage nearest to your appointment location. Check in at desk M60.

## Notes

- Greeters in red coats are available to assist you.
- Valet parking is available at the H Main Entrance, at the Crile (A) Building, Cole Eye Institute (i) and at Taussig Cancer Center (R). Patients are responsible for parking fees.
- Information desks are indicated on the map with (?) question marks.
- The H (\*) Main Entrance is the patient drop-off and pick-up for most buildings (F, G, H, M, S, T).



9500 Euclid Avenue, Cleveland, OH 44195

The Endocrinology & Metabolism Institute is one of 26 institutes at Cleveland Clinic that group multiple specialties together to provide collaborative, patient-centered care. The institute offers specialized centers of care for diabetes, and thyroid, pituitary and weight disorders. Our surgeons perform the most endocrine surgeries in the region, and the bariatrics program is designated a Bariatric Surgery Center of Excellence by the American Society for Metabolic and Bariatric Surgery. Cleveland Clinic is a nonprofit, multispecialty academic medical center. Founded in 1921, it is dedicated to providing quality specialized care and includes an outpatient clinic, a hospital with more than 1,000 staffed beds, an education institute and a research institute.

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## References

1. Schauer PR, Ikramuddin S, Gourash W, et al. Outcomes after laparoscopic Roux-en-Y gastric bypass for morbid obesity. *Ann Surg.* 2000; 232(4):515-529. 2. Sugerman HJ, Felton WL, 3rd, Sismanis A, et al. Gastric surgery for pseudotumor cerebri associated with severe obesity. *Ann Surg.* 1999; 229(5):634-640; discussion 640-642. 3. Mattar SG, Velcu LM, Rabinovitz M, et al. Surgically induced weight loss significantly improves nonalcoholic fatty liver disease and the metabolic syndrome. *Ann Surg.* 2005;242(4):610-620. 4. Schauer PR, Burguera B, Ikramuddin S, et al. Effect of laparoscopic Roux-en-Y gastric bypass on type 2 diabetes mellitus. *Ann Surg.* 2003;238(4):467-484; discussion 484-485. 5. DeMaria EJ, Sugerman HJ, Kellum JM, et al. Results of 281 consecutive total laparoscopic Roux-en-Y gastric bypasses to treat morbid obesity. *Ann Surg.* 2002;235(5):640-645; discussion 645-647. 6. Christou NV, Sampaolis JS, Liberman M, et al. Surgery decreases long-term mortality, morbidity, and health care use in morbidly obese patients. *Ann Surg.* 2004;240(3):416-423; discussion 423-424. 7. Wittgrove AC, Clark GW. Laparoscopic gastric bypass, Roux-en-Y - 500 patients: technique and results, with 3-60 month follow-up. *Ann Surg.* 2000;130(3):233-239. 8. Sugerman HJ, Sugerman EL, Wolfe L, et al. Risks and benefits of gastric bypass in morbidly obese patients with severe venous stasis disease. *Ann Surg.* 2001;234(1):41-46. 9. Eid GM, Cottam DR, Velcu LM. Effective treatment of polycystic ovarian syndrome with Roux-en-Y gastric bypass. *Surg Obes Relat Dis.* 2005;1:77-80. 10. Adams TD, Gress RE, Smith SC, et al. Long-term mortality after gastric bypass surgery. *N Engl J Med.* 2007;357:753-761. 11. Sjostrom L, Narbro K, Sjostrom D, et al. Effects of bariatric surgery and mortality in Swedish obese subjects. *N Engl J Med.* 2007;357:741-752.