OBESITY:
A Growing & Dangerous Public Health Challenge

do you know
YOUR GI RISKS?
Obesity’s Staggering Burden upon the Nation’s Health, and Health Care System

The prevalence of obesity in the United States has more than doubled in the past half century, adding a staggering burden to our current health care system. It is commonly assumed that overweight and obesity ensue as a consequence of deficient will power or disproportionate consumption. Recent years have shed light on the complicated science of obesity, enlightening researchers to its complexities. With a new appreciation for obesity as a disease and global well-being in mind, we have an enormous opportunity before us: we can prevent obesity by pushing for change in public policy; commit to educating our children on healthy eating, the benefits of physical activity and illness-prevention habits; and incorporate meaningful tools for weight loss into our prescription for improving patients’ health.

~ Amy E. Foxx-Orenstein, DO, FACG – ACG President 2007-2008

Obesity’s Relevance to the Gastroenterologist

Situation Analysis

ACG’s Obesity Action Plan

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• Recognizing Excellence in Obesity-Related GI Research

Why Obesity Matters to the Gastroenterologist: A Distinct and Additive Role for GI

• Risk of GI Disease Associated with Obesity

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• Waist Circumference — Waist-to-Hip Ratio
• Tools for Patient Counseling — How to Talk to Patients About Their Weight
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Obesity’s Relevance to the Gastroenterologist

Our nation is facing an unprecedented obesity epidemic. Results from the 2003-2004 National Health and Nutrition Examination Survey (NHANES), using measured heights and weights, indicate that an estimated 66 percent of U.S. adults are either overweight or obese. According to more recent data, over 25 percent of U.S. adults now may be defined as obese (body mass index [BMI] > 30 kg/m²) according to self-reported weight and height data from the CDC’s Behavioral Risk Factor Surveillance System (BRFSS). The American College of Gastroenterology recognizes that the epidemic of obesity is a problem at the forefront of American public health concerns and considers it imperative that GI physicians engage in efforts to define new treatment options, refine existing approaches and enhance the management of associated complications.

The growing epidemic of obesity is of particular relevance to gastroenterologists because of the clearly documented associations of obesity with a number of gastrointestinal disease risk factors and outcomes, including mortality rates and unfavorable risk profiles. The health implications posed by overweight and obesity involve a wide spectrum of disease states, including many gastrointestinal diseases, GERD, Barrett’s esophagus, erosive esophagitis, steatohepatitis/nonalcoholic fatty liver disease (NAFLD), cholelithiasis, pancreatitis and cancer, particularly colorectal and esophageal. In the future, gastroenterologists may play an even greater role in treating obesity, not just managing its complications, as the understanding of the GI tract’s role in the control of appetite grows and as new interventions and novel therapeutic approaches related to the gut emerge.

OUR NATION’S “OBESOGENIC ENVIRONMENT” — THE MOST IMPORTANT PUBLIC HEALTH CHALLENGE OF OUR TIME

According to the National Heart Lung and Blood Institute, overweight and obesity are among the most important Leading Health Indicators in Healthy People 2010, the Nation’s health objectives for the first decade of the 21st century. The Surgeon General’s Call to Action To Prevent and Decrease Overweight and Obesity 2001 not only identified overweight and obesity as a national epidemic but designated it the most important public health challenge of our time. The increased prevalence illustrates alarming trends for people of all ages, racial/ethnic groups, and genders.


Situation Analysis

In 1991, obese adults made up less than 15 percent of the population in most U.S. states. By 2004, not a single state could claim that distinction, and in nine states more than 25 percent of the residents were obese. Today, an estimated 149 million adult Americans weigh more than is healthy. According to the Centers for Disease Control and Prevention, data from the NHANES survey reveals that among adults aged 20-74 years, the prevalence of obesity increased to 32.9% (in the 2003-2004 survey).

If this trend continues, almost nine in ten adults may be overweight or obese by 2030 with related health care spending projected to be as much as $956.9 billion, according to national survey data analyzed by researchers at Johns Hopkins and the federal government’s Agency for Health Care Research & Quality (AHRQ). This team predicts that by 2030, half of U.S. adults will be obese, as will 97 percent of black women and 91 percent of Mexican-American men.

Even more alarming, the prevalence of overweight and obesity in children and adolescents is on the rise, and they are becoming overweight and obese at earlier ages. The prevalence of childhood obesity has tripled since 1980 and now almost 20 percent of children suffer from excess weight or obesity.
The College's primary objective in encouraging an enhanced focus on nutrition, metabolism and obesity is to bring the clinical and scientific expertise of GI physicians to bear in formulating solutions to the obesity epidemic — both at the national health policy level and in terms of advancing clinical practice.

The College has invited a distinguished Task Force on Obesity to develop materials for both GI physicians and their patients. The College is grateful to the following physicians for their leadership and contributions to the work of the Obesity Task Force:

- Carol A. Burke, MD, FACG, Cleveland Clinic Foundation
- Michael R. Charlton, MD, Mayo College of Medicine
- Amy E. Foxx-Orenstein, DO, FACG, Mayo College of Medicine
- Hashem B. El-Serag, MD, MPH, Baylor College of Medicine
- Lisa Ganjhu, DO, St. Luke's-Roosevelt Hospital
- David A. Greenwald, MD, FACG, Montefiore Medical Center
- David A. Johnson, MD, FACG, Eastern Virginia Medical School
- Joel E. Lavine, MD, PhD, UC San Diego, Dept. Pediatric GI
- Philip R. Schauer, MD, Cleveland Clinic Foundation

The ACG Annual Scientific Meeting and Postgraduate Course this year feature important clinical updates on the expanding science of obesity. From the lectures and symposia, GI clinicians will garner valuable strategies for managing obesity and its complications. The ACG Educational Affairs Committee, under the leadership of Jean-Paul Achkar, MD, FACG and in conjunction with Postgraduate Course Co-Directors, Brooks D. Cash, MD, FACG, Neena S. Abraham, MD, FACG and Stephen C. Hauser, MD, FACG, has invited several prominent speakers and planned important educational sessions featuring obesity at the 2008 Annual Scientific Meeting & Postgraduate Course.

ACG 2008 Scientific Sessions & Special Lectures Feature Obesity Topics

**State of the Art Lecture at ACG Postgraduate Course**
At the invitation of the College and the Postgraduate Course Co-Directors, Michael R. Charlton, MD of The Mayo Clinic will present the PG Course State of the Art Lecture, "NAFLD — State of the Art and State of the Nation".

**The American Journal of Gastroenterology Lecture**
Each year the College and publisher Wiley-Blackwell sponsor a dynamic lecture. This year the editors have invited two distinguished clinicians to share the latest on "Endoscopic Management of Obesity" with Christopher C. Thompson, MD, FACG, and "Reoperative Bariatric Surgery, When To and Not To" with Michael Sarr, MD.

**Obesity Offerings at ACG Annual Scientific Meeting**
“Appetite Regulation: Curb Your Enthusiasm”
Amy E. Foxx-Orenstein, DO, FACG

“Foie Gras (NAFLD): Too Much of a Good Thing?”
Naga Chalasani, MD, FACG

“Choosing the Right Cut: The Role of Endoscopy and Surgery in Treatment”
Anthony N. Kalloo, MD, FACG

**Obesity Offerings at ACG PG Course**
The PG Course features a session on Sunday, October 5, 2008
“The Expanding Science of Obesity”
Amy E. Foxx-Orenstein, DO, FACG

“GI Complications of Obesity”
Hashem B. El-Serag, MD, MPH

“Medical Management of Obesity”
Mark T. DeMeo, MD, FACG

“Surgical Management of Obesity and Post-Operative Complications”
Peter T. Hallowell, MD

**Recognizing Excellence in Obesity-Related GI Research**
For the first time, the College has created an Abstract Award on an Obesity-Related Topic for the 2008 Annual Scientific Meeting. From among the abstracts submitted, the Educational Affairs Committee identified the best original or basic science oriented work in the area of obesity as it impacts gastrointestinal diseases or treatments. The College is pleased to recognize the winning abstract for the first ACG Obesity Research Award:

“Increased Soluble FAS and FAS Ligand Levels in Patients with Nonalcoholic Steatohepatitis,” Michael Berk, MD, Tamali Bhattacharyya, MD, MS, Lisa Yerian, MD, Arthur McCollough, MD, FACG, Ariel Feldstein, MD, Cleveland Clinic Foundation.
Why Obesity Matters to the Gastroenterologist: A Distinct and Additive Role for GI

Gastrointestinal specialists are on the front line in diagnosing and treating patients with a range of digestive diseases and complications directly related to obesity, particularly colorectal and esophageal cancer, gallbladder and liver disease.

The magnitude of the obesity epidemic, coupled with new understanding of the role of gastrointestinal microflora in metabolism, as well as the role of gut hormones in appetite and weight regulation, points to a role for GI specialists in the management of obesity as the next generation of endoscopic, pharmacological and nutritional therapies emerges. In the short term, the clinical expertise of gastroenterologists is clearly needed to care for the hundreds of thousands of patients undergoing bariatric surgery, and, in the long term, as minimally invasive endoscopic surgical techniques are perfected, the potential exists for GI physicians to participate in the full spectrum of care for the surgical treatment of severe obesity.

### RISK OF GI DISEASE ASSOCIATED WITH OBESITY

**Hashem B. El-Serag, MD, MPH**

**Magnitude of Increased Risk with Obesity**

*(compared to normal or low BMI)*

<table>
<thead>
<tr>
<th>Disease</th>
<th>Magnitude</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ESOPHAGUS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GERD symptoms</td>
<td>50%</td>
<td>Abdominal obesity</td>
</tr>
<tr>
<td>Erosive esophagitis</td>
<td>50%-100%</td>
<td></td>
</tr>
<tr>
<td>Barrett’s esophagus</td>
<td>2-fold</td>
<td></td>
</tr>
<tr>
<td>Esophageal adenocarcinoma</td>
<td>2-fold</td>
<td></td>
</tr>
<tr>
<td><strong>GALLBLADDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stones</td>
<td>2-3 fold</td>
<td>More in women</td>
</tr>
<tr>
<td>Cancer</td>
<td>35-85%</td>
<td>More in women</td>
</tr>
<tr>
<td><strong>PANCREAS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>35-85%</td>
<td>Abdominal obesity</td>
</tr>
<tr>
<td>Worse acute pancreatitis</td>
<td>20-50%</td>
<td></td>
</tr>
<tr>
<td><strong>COLON</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adenoma (especially advanced)</td>
<td>50-100%</td>
<td>Colon (not rectum), more in men, more with abdominal obesity</td>
</tr>
<tr>
<td>Cancer</td>
<td>2-fold</td>
<td></td>
</tr>
<tr>
<td><strong>LIVER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non alcoholic fatty liver disease</td>
<td>2-3 fold</td>
<td>Abdominal obesity</td>
</tr>
<tr>
<td>Advanced HCV-related disease</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>30-50%</td>
<td></td>
</tr>
<tr>
<td>Hepatocellular carcinoma</td>
<td>30-50%</td>
<td></td>
</tr>
</tbody>
</table>

**OBESITY & THE RISK OF ESOPHAGEAL AND COLON DISEASE**

**David A. Johnson, MD, FACG**

**Colon-Related Risks**

**INCREASED RISKS: Colon cancer, precancerous colon polyps**

EVIDENCE BASE: There is a strong association between obesity and the risk of developing colon cancer (relative risk of 1.5-2.8). The association is evident but weaker and less consistent in women (RRs of 1.2-1.5). Further, obesity is associated with an increased risk in premenopausal, but not postmenopausal, women. The relative risks are higher for the colon than for the rectum. Obesity also doubles the risk of the development of colon adenomas. Again, the risk appears to be higher in men than women. Obesity-related risk of adenomas is increased in particular by abdominal (truncal) obesity.


**Esophagus-Related Risks**

**INCREASED RISKS: Gastroesophageal reflux disease (GERD); complications of GERD, including erosive esophagitis, severe erosive esophagitis (LA grade C&D), Barrett’s esophagus, esophageal adenocarcinoma**

EVIDENCE BASE: There are at least eight cross-sectional studies that examined GERD using appropriate validated questionnaires in the general population. The pooled weight related risks of GERD among overweight and obese patients are 1.5 and 2.0, respectively. Similar data is reported for more severe erosive disease (LA grade C and D). The association with Barrett’s esophagitis is evident by same ratios, but not as strong as the association with esophageal adenocarcinoma and adenocarcinoma of the gastric cardia. All of the epidemiologic studies to date have consistently identified obesity with increased risk of esophageal adenocarcinoma (RR 2.1).

Combating a Devastating Trend: Addressing Obesity in the GI Setting

**BMI and Waist Circumference as the “Fifth Vital Sign”**

Make the determination of every patient’s Body Mass Index (BMI) and Waist Circumference a part of your office routine — just like other vital signs.° BMI is calculated by the relationship of weight (in kg) divided by the height (in m²). BMI usually highly correlates with the percent of body fat; however, those individuals with excess muscle mass may have a BMI suggesting obesity. In addition, some people with BMIs in the normal range may have reduced muscle mass and excess fat.³

**Waist Circumference — Waist-to-Hip Ratio**

Waist Circumference provides an independent prediction of risk beyond that of BMI. Waist-to-hip ratio (WHR) is the ratio of your waist circumference to your hip circumference (calculated by dividing the waist circumference by the hip circumference). WHR is a measurement tool that looks at the proportion of fat stored on your waist, and hips and buttocks. Weight concentrated around the middle is often referred to as an “apple” shape; whereas, weight concentrated around your hips is referred to as a “pear” shape. For both men and women, a WHR of 1.0 or higher is considered “at risk” for heart disease and other problems associated with being overweight. A high waist circumference is associated with a high risk ratio for development of type II diabetes, dyslipidemia, hypertension, and cardiovascular disease in individuals with a BMI of 25-35 kg/m².

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**CLASSIFICATION OF OVERWEIGHT AND OBESITY BY BMI, WAIST CIRCUMFERENCE, AND ASSOCIATED DISEASE RISK**

<table>
<thead>
<tr>
<th>BMI (KG/M²)</th>
<th>OBESITY CLASS</th>
<th>MEN 102 CM (40 IN) OR LESS</th>
<th>WOMEN 88 CM (35 IN) OR LESS</th>
<th>MEN &gt; 102 CM (40 IN)</th>
<th>WOMEN &gt; 88 CM (35 IN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Normal +</td>
<td>18.5 - 24.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0 - 29.9</td>
<td>Increased</td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>30.0 - 34.9</td>
<td>I</td>
<td>High</td>
<td>Very High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35.0 - 39.9</td>
<td>II</td>
<td>Very High</td>
<td>Very High</td>
<td></td>
</tr>
<tr>
<td>Extreme Obesity</td>
<td>40.0 +</td>
<td>III</td>
<td>Extremely High</td>
<td>Extremely High</td>
<td></td>
</tr>
</tbody>
</table>

* Disease risk for type 2 diabetes, hypertension, and CVD.

+ Increased waist circumference can also be a marker for increased risk even in persons of normal weight.

BMI Calculators from the NHLBI
The NHLBI has an online BMI calculator using either Standard or Metric measures. http://www.nhlbisupport.com/bmi/

You can also download the BMI calculator to Palm OS or Pocket PC 2003 devices on the NHLBI Web site. http://hp2010.nhlbihin.net/bmi_palm.htm

Tools for Patient Counseling — How to Talk to Patients about Their Weight
Gastroenterologists can provide a valuable clinical service by becoming actively involved in helping their obese patients lose weight. One may think that this is not the job of the gastroenterologist, but that of the primary care provider. That is not the case. This is a battle in which all parties must come together in a united front: patient, primary care provider, and gastroenterologist. In many cases, the internist acts as gatekeeper, managing the patient as a whole, including the many complications of obesity such as hypertension, diabetes, and high cholesterol. The gastroenterologist is invested in the organs of digestion, intestinal transport and absorption and may be called upon to manage such complications of obesity as GERD, colon cancer or NASH. The patient’s role is to commit to change. Patients need to understand that the medical problems from which they suffer are related to obesity and to understand that changes in lifestyle could change their medical outcome.

As a busy gastroenterologist, time is a luxury. Trying to carve out more time to initiate the conversation with patients on obesity may seem taxing or even impossible. The American College of Gastroenterology understands and appreciates these challenges, and has developed the education materials in this kit. Further resources for patients are available at the ACG Web site www.acg.gi.org/obesity. The online tools are offered to help a busy gastroenterologist to start the conversation with their overweight or obese patients, with the ultimate goal of helping patients to better manage their health problems and to change their medical course.

Tips on Starting the Conversation With Patients About Overweight and Obesity
First and most importantly, educate the patient: inform them on the link between overweight and obesity and GI symptoms and illness. Most patients are unaware of the relationship. Let patients know that they have some control in their health. Share the idea that managing their health is their responsibility.

Once they understand and are willing to change, talk to patients about the obstacles they might face. You might ask:
• How did they get to their present weight?
• How do they feel about their weight?
• What are their weight and health goals?
• Do they want to change and are they ready to change?

Discuss their options and whether they have access for help in losing weight:
• Can they do it on their own?
• Do they have a partner who shares the same or similar goals (e.g., a friend, sibling, or spouse)
• Do they have access to a gym or to weight loss programs such as WeightWatchers™?

It is essential to review these issues in a caring, supportive, non-judgmental fashion. Many overweight and obese patients feel discriminated against and get defensive when discussing their weight. It’s also important to create a friendly environment and to develop a community to support your patients in your office. Time management issues can be supported by involving a PA/NP or nutritionist. GI behavior modification support from a mental health care worker may help to overcome the psychological barriers to weight loss.

Using the ACG Poster, “Obesity: Know Your GI Risks,” show patients the BMI and waist circumference charts. Indicate where they fall on the grid and show them the target range for their weight. Encourage patients to set small goals of approximately 5 to 10 percent at time.

Tools to Counsel Overweight & Obese Patients Available at www.acg.gi.org/obesity:
• Food and exercise diary — Studies have shown tracking meals and adjusting intake as they go along will help with weight loss
• Guides to healthy eating at home and dining out — Educating the patients on healthy eating habits and setting up and stocking a healthy kitchen pantry
• Calorie counts on common foods
• Tips on how to choose healthy restaurant and fast food options
• Calorie expenditure chart to help burn off calories
• Internet links to Additional Resources
**Principles of Effective Obesity Counseling**

- Communicate empathetically
- Establish a patient-physician partnership
- Deliver health counseling effectively
- Be sensitive to bias against overweight and obese individuals

**Strategies to Reduce Bias Against Overweight & Obese Patients**

- Recognize that obesity is a chronic medical condition
- Improve your knowledge of nutrition, multi-disciplinary treatments and community resources
- Create a friendly office culture and atmosphere
- Treat the overweight and obese population with respect and support

Source: Adapted from “Communication and Counseling Strategies” American Medical Association 2003 Roadmaps for Clinical Practice, “Assessment and Management of Adult Obesity: A Primer for Physicians”

**Behavior Modification**

Behavioral therapy, in combination with reduced calorie intake and increased physical activity, constitute lifestyle modification. A comprehensive approach of lifestyle modification is effective in inducing and maintaining losses of ~10 percent of initial weight. Losses of this size are associated with the prevention and amelioration of obesity-related health complications including type II diabetes and hypertension.\(^{10}\)

**Resource for Counseling the Obese Patient from NHLBI**

A concise three step approach to initiating discussion about weight management with patients developed by NHLBI offers tips on skillful and empathetic communication including setting an effective tone, assessing patient motivation/readiness and building a partnership with the patient.


**Role of Gastroenterologists in Post-Operative Care for Bariatric Surgery Patients**

Gastroenterologists often evaluate and treat the GI-related anatomic and metabolic complications following surgery for obesity. Given the increasing utilization of bariatric surgery, it is key that GIs understand not only the anatomy of these surgeries, but the endoscopic appearances and appropriate intervention strategies.\(^ {11}\)

Among the resources for gastroenterologists developed by the College for this Obesity Tool Kit are reprints of presentations by Dr. Philip R. Schauer, noted bariatric surgeon, entitled, “BMI>30 What Next?” as well as Dr. David A. Johnson’s 2007 presentation at ACG on “GI Complications of Bariatric Surgery: What the Endoscopist Needs to Know - Anatomy, Strictures, Ulcers.” For these talks, please see Appendix I.

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**Components of Behavior Therapy**

- **Social Support**
- **Cognitive Restructuring**
- **Stimulus Control**
- **Stress Management**
- **Self Monitoring**
- **Problem Solving**
- **Contingency Management**

In 2007, the American College of Gastroenterology saw an immediate and pressing need for physician leadership on obesity at the national level. ACG partnered with the Campaign to End Obesity and is co-chaining a work group on restructuring the healthcare system to deal with the nation's obesity epidemic. In May 2007, members of Congress, representatives of a wide range of consumer advocacy and disease groups and ACG convened at an “Obesity Summit” to develop policy recommendations for federal lawmakers on how to address the challenges presented by obesity. ACG was the only specialty society on the summit's steering committee. Dr. David Greenwald represented the College.

The CEO Obesity Summit made recommendations in three areas: nutrition, physical activity and changes to the healthcare system. For example, the Summit recommended that the federal government “recognize obesity as a complex disease, with strong adverse health effects, establish diagnosis codes, and require coverage for prevention, screening, diagnosis and multi-treatment programs that are coupled to measurement of health outcomes.” The Summit also recommended that the federal government increase “support for basic, clinical, epidemiological and health services research focused on obesity across all agencies of the federal government to bring it in line with investments aimed at solving other major medical problems.”

The Summit was just the beginning of an ongoing cross-disciplinary effort to push federal policymakers to develop and implement policies that will address this growing national crisis. The ongoing work of the summit is being carried on by the Coalition to End Obesity. Currently, Dr. Amy Foxx-Orenstein, as ACG President, serves as Co-Chair of the Health System Restructuring work group, representing the College at the national level, and contributes to the development of legislative and regulatory strategies to address obesity in the United States. This high profile partnership with CEO offers the College a platform for action and a voice in a national dialogue with leaders from medicine, government and industry.

The work of CEO is ongoing and in May 2008, they issued a Call-to-Action to the United States Congress and hosted a Health Policy and Fitness Fair on Capitol Hill. ACG joins CEO in its commitment to making a meaningful contribution to the nation’s public health policy, clinical practice and clinical research relating to obesity and shares CEO’s appeal to Congress and other policymakers to take action to address the national health threat of obesity.

The American College of Gastroenterology has been proud to support the work of the Campaign to End Obesity this year in its crucial efforts to educate policymakers on the nexus between obesity and many of the nation’s major public health challenges. ACG applauds CEO’s efforts to ensure that the U.S. healthcare system can appropriately treat overweight and obese patients and address obesity.

OPPORTUNITIES ACROSS THE POLICY LANDSCAPE TO IMPROVE OBESITY PREVENTION, MANAGEMENT & TREATMENT — FROM THE CAMPAIGN TO END OBESITY

Samples of a selection of CEO’s priorities for Congressional action span the policy spectrum and aim to improve key elements of the world in which people live — their education, health care, finances, worksites and communities. These positions are adapted from CEO’s “Call-to-Action” delivered to Congress in May 2008, and while ACG supports CEO and its efforts, the College does not endorse any of these specific priorities.

**Education**
- Require schools to report on the quantity and quality of physical education offered to students on school district and state report cards
- Provide incentives for schools that meet national standards for physical education
- Increase investment in the USDA Fruit and Vegetable Program so that vulnerable students in all states can have access to this program

**Health Care and Public Health**
- Expand coverage for Medical Nutrition Therapy to patients at risk for and suffering from obesity
- Pilot reimbursement for managing and treating obesity
- Authorize coverage for services to manage and treat pediatric obesity via SCHIP

**Finances**
- Increase assistance via Federal food programs such as food stamps for purchasing fruits and vegetables
- Allow physical activity expenses to be deducted as medical expenses
- Provide a tax credit for physical activity participation to low income families

**Work Environment**
- Reduce financial barriers to worksite obesity prevention and intervention initiatives by amending the IRS Code to:
  - Exclude offsite health club or gym benefits from taxable income
  - Provide employers with a tax credit for the costs of qualified wellness programs
  - Provide employees with a tax credit for participating in qualified wellness programs
  - Include bicycle commuting allowances as qualified transportation fringe benefit

**Public Policy Issues — About ACG’s Role in the Campaign to End Obesity “CEO”**

ACG applauded CEO’s efforts to ensure that the U.S. healthcare system can appropriately treat overweight and obese patients and address obesity.
Key Obesity Articles for the Busy GI Clinician


Endocrine Reviews. December 2006, Volume 27, Number 7. This volume covers pathophysiology, genetics of obesity, role of gut peptides, etc.


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Physician Education & CME Resources

**NHLBI Professional Resources**

NHLBI has numerous offerings for health care professionals, including slides to download for community education, such as the excellent “Portion Distortion” presentation.


**NHLBI PORTION DISTORTION SLIDES**


NHLBI Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults

The National Heart, Lung, and Blood Institute (NHLBI), in cooperation with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), released the first Federal guidelines on the identification, evaluation, and treatment of overweight and obesity in 1998.


This 2000 guide was developed in cooperation with the National Heart, Lung, and Blood Institute (NHLBI). It is based on the Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: Evidence Report developed by the NHLBI Expert Panel and released in June 1998. The panel used an evidence-based methodology to develop key recommendations for assessing and treating overweight and obese patients. The goal of the guide is to provide the tools physicians need to effectively manage overweight and obese adult patients.


**Centers for Diseases Control & Prevention**

**CDC WEIGHT MANAGEMENT “RESEARCH TO PRACTICE” SERIES**

Developed by the CDC to summarize the science on weight management topics for health professionals.

[http://www.cdc.gov/nccdphp/dnpa/nutrition/health_professionals/practice/index.htm](http://www.cdc.gov/nccdphp/dnpa/nutrition/health_professionals/practice/index.htm)
The Obesity Society — CME Offerings
The Obesity Society offers evidence-based obesity education and online professional continuing education programs.
http://www.obesityonline.org/cme/index.cfm

Bariatric Surgery for the Treatment of Obesity
In this talk, Samuel Klein, MD and Harvey Sugerman, MD present an overview of surgical therapies for the management of severe obesity. They discuss the indications, contraindications, postoperative complications, and expected long-term results from each of the bariatric surgical procedures currently being performed in the U.S.

Weight Bias and Its Social, Economic, and Health Impact
In this slide talk, Kelly Brownell, PhD and Rebecca M. Puhl, PhD present the growing body of scientific evidence which demonstrates that in the United States, weight bias exists towards people of all ages — including very young children, as well as adults who are obese, and being a target of weight bias leads to multiple negative outcomes, including consequences for emotional, social, and physical health.

Weight Bias in Health Care Settings
This slide talk presents data on how weight loss, combined with treatment for the other risk factors associated with the metabolic syndrome, has been shown to reverse all components of atherogenic dyslipidemia and reduce the risk of onset of adverse cardiovascular events.

Office Management of Obesity ** Includes Reimbursement Tips
The objective of this program is to educate participants about diet and counseling suggestions, physical guidelines and reimbursement information. Support for this activity was provided by an unrestricted educational grant from Abbott Laboratories. http://www.obesitycme.org/

Assessment and Management of Overweight and Obesity in Adults
Developed jointly with the National Heart, Lung, and Blood Institute (NHLBI), the objective of the two modules in this program is to educate participants about the importance of weight management, health risks, treatment, weight loss motivations, and appropriate strategies. http://obesitycme.nhlbi.nih.gov/

Patient Education Resources
National Heart, Lung and Blood Institute
NHLBI Publications “aim for a healthy weight”
The NHLBI guidelines provide patients with a new approach for the measurement of overweight and obesity and a set of steps for safe and effective weight loss.

National Institute of Diabetes and Digestive and Kidney Diseases
Weight-Control Information Network (WIN)
NIDDK’s Weight-Control Information Network provides the general public, health professionals, the media, and Congress with up-to-date, science-based information on weight control, obesity, physical activity, and related nutritional issues.
Weight-Control Information Network (WIN)
1 WIN Way • Bethesda, MD 20892-3665
Phone: (202) 828-1025 • Toll-free number: 1-877-946-4627
FAX: (202) 828-1028 • Email: win@info.niddk.nih.gov

For more information on health risks and treatment options for obesity, refer to these weight-control Information Network (WIN) publications:
CDC — PATIENT BROCHURE EAT MORE WEIGH LESS
CDC has developed a colorful pamphlet on adding low calorie, nutrient dense foods to the diet as a weight control strategy.

CDC — AT-A-GLANCE 2008 PHYSICAL ACTIVITY AND GOOD NUTRITION: ESSENTIAL ELEMENTS TO PREVENT CHRONIC DISEASES AND OBESITY

CDC — NUTRITION PHYSICAL ACTIVITY OBESITY SECTION
CDC’s main Web portal to online resources for professionals and patients http://www.cdc.gov/nccdphp/dnpa/

U.S. Department of Health and Human Services
OFFICE OF WOMEN’S HEALTH
Materials from the National Women's Health Information Center include Food & Diet Tools including menu planners and trackers.

FOOD AND DIET TOOLS http://www.4woman.gov/tools/#food
• Healthy Weight Menu Planner
• How to Read a Food Label
• MyPyramid.gov - Steps to a Healthier You
• MyPyramid Tracker

American Medical Association
A useful series of templates and trackers for patient counseling regarding weight loss is available to download from the American Medical Association, including a food diary, physical activity log and other helpful tips.

AMA ROADMAPS FOR CLINICAL PRACTICE SERIES: ASSESSMENT AND MANAGEMENT OF ADULT OBESITY
Produced with support from the Robert Wood Johnson Foundation, and developed in 2003 in collaboration with the U.S. Department of Health and Human Services, Assessment and Management of Adult Obesity consists of 10 booklets that offer practical recommendations for addressing adult obesity in the primary care setting.

The primer offers practical advice on:
• evaluating patients for current and potential health risks related to weight — beginning with a measure of the body mass index (BMI);
• understanding medication and surgical options;
• improving communication and counseling; and
• making office environments more accommodating to obese patients.

The clinical tools and patient handouts that appear throughout the booklets also can be downloaded as PDF files.
Booklet 1 - Introduction and clinical considerations
Booklet 2 - Evaluating your patients for overweight or obesity
Booklet 3 - Assessing readiness and making treatment decisions
Booklet 4 - Dietary management
Booklet 5 - Physical activity management
Booklet 6 - Pharmacological management
Booklet 7 - Surgical management
Booklet 8 - Communication and counseling strategies
Booklet 9 - Setting up the office environment
Booklet 10 - Resources for physicians and patients

CLINICAL TOOLS
• Assessment of health risks
• Assessment of patient readiness
• Treatment options
• The office environment

To link to the AMA’s Roadmaps for Clinical Practice Series on Managing Adult Obesity http://www.ama-assn.org/ama/pub/category/10931.html

Weight Loss Resources
AMERICAN DIETETIC ASSOCIATION
http://www.eatright.org
216 West Jackson Boulevard
Chicago, IL 60606-6995
(800) 366-1655

AMERICAN OBESITY ASSOCIATION
http://www.obesity.org
c/o The Obesity Society
8630 Fenton Street, Suite 918
Silver Spring, MD 20910
301-563-6526

AMERICAN SOCIETY FOR METABOLIC & BARIATRIC SURGERY
http://www.asbs.org
100 SW 75th Street, Suite 201
Gainesville, FL 32607
Phone: 352-331-4900
Fax: 352-331-4975

FOOD AND NUTRITION INFORMATION CENTER
http://www.nal.usda.gov/fnic/
National Agricultural Library
10301 Baltimore Avenue, Room 105
Beltsville, MD 20705
Phone: (301) 504-5414
Fax: (301) 504-6409

FOOD SAFETY INFORMATION
http://www.foodsafety.gov/
Of Further Interest

**Weight Bias**

According to the Obesity Society, “there is accumulating evidence of clear and consistent bias, stigmatization, and in some cases discrimination, against obese individuals.” The Obesity Society issued a policy statement on weight bias in 2005. A review of the scientific literature found evidence of clear and consistent stigmatization of obese individuals in three domains of living: employment, education, and health care. (Puhl and Brownell, 2001). Further, according to the Obesity Society, recent studies have also documented automatic negative associations with obese people among health professionals (Schwartz et al., 2003; Teachman & Brownell, 2001.)

For more information on weight bias and the Obesity Society's advocacy efforts see

http://www.obesity.org/about/20050501.asp

**WEIGHT BIAS FACT SHEET**

http://www.obesity.org/information/weight_bias.asp

**NEAT (Non-Exercise Activity Thermogenesis)**

Non-exercise activity thermogenesis (NEAT) is all activity that occurs during a 24-hour period that is not voluntary activity. This includes the energy expenditure of daily activities such as sitting, standing, walking, talking, and fidgeting. Levine et al. at Mayo Clinic have been interested in whether energy expenditure can interact with an increased food energy availability to determine who gains weight and who does not. Their research reveals that NEAT is significantly greater in the lean than in the obese.

http://mayoresearch mayo.edu/mayo/research/levine_lab/about.cfm — link to Dr. Levine’s lab at Mayo Clinic

http://www.obesityonline.org/commentaries/al_abstract.cfm?abs_id=abs_007 — link to slides on NEAT from the Obesity Society


**Fructose**

The effects of dietary fructose have been researched for years. Fructose can elevate serum triacylglycerol concentrations in healthy and diabetic subjects, which could be atherogenic. Following ingestion of fructose (even if mixed with other sugars), there is a significant immediate lipogenic effect that is associated with higher serum triglyceride concentrations. There is evidence suggesting that fructose causes hyperlipidemia postprandially directly, and indirectly by increasing liver re-esterification of fatty acids from all sources.


**Obesity in Children**

The prevalence of obesity is rising in all ages, races and genders in the United States but the relative increase is greatest among our children. The increase in early obesity is responsible for an increase in obesity-related diseases in children, such as type 2 diabetes, that were previously considered “adult” diseases.

Overweight is a serious health concern for children and adolescents. Data from two National Health and Nutrition Examination (NHANES) surveys (1976-1980 and 2003-2004) show that the prevalence of overweight is increasing: for children aged 2-5 years, prevalence increased from 5.0% to 13.9%; for those aged 6-11 years, prevalence increased from 6.5% to 18.8%; and for those aged 12-19 years, prevalence increased from 5.0% to 17.4%.12

**WEIGHT ISSUES IN CHILDREN, AMERICAN ACADEMY OF FAMILY PHYSICIANS**

A concise overview of weight issues in children including practical tips on better eating habits.


**CDC’s BMI-FOR-AGE CALCULATOR**


This calculator provides BMI and the corresponding BMI-for-age percentile on a CDC BMI-for-age growth chart. Use this calculator for children and teens, aged 2 through 19 years old. For adults, 20 years old and older, use the Adult BMI Calculator.

**CHILDREN THE TARGET OF FOOD ADS**

“The nation's largest food and beverage companies spent about $1.6 billion marketing their products — mainly soda, fast food and cereal — to children in 2006, according to a Federal Trade Commission report on food marketing to children released yesterday.”

Washington Post, July 30, 2008
Footnotes


5 http://www.cdc.gov/nccdphp/dnpa/obesity/index.htm


11 Johnson DA. “GI Complications of Bariatric Surgery,” 2007 ACG Annual Scientific Meeting Symposium “Spotlight on Obesity”.


Appendices

Appendix 1

Amy E. Foxx-Orenstein, DO, FACP, “Appetite Regulation: Are We Programmed to Be Fat?”

Philip R. Schauer, MD, “BMI>30 What Next?”

APPETITE REGULATION: ARE WE PROGRAMMED TO BE FAT?
Amy E. Foxx-Orenstein, DO, FACG

Slide 1

Appetite Regulation:
Are We Programmed to Be Fat?

Amy Foxx-Orenstein, D.O., FACG, FACP
Mayo Clinic

Slide 2

Evolution Has Programmed Us To Eat As Much As We Can Whenever We Can

Nature never planned for what could happen when unchecked appetites were met by unchecked resources

67% of the US population is overweight or obese. 17% of children aged 6-19

Slide 3

Fat Stores Are Determined by Net Balance of Energy Intake and Energy Expenditure

- Law of thermodynamics
  energy intake > expenditure = storage as adipose

Slide 4

Genetic Changes May Account for Increased Prevalence in Obesity

- Bisphenol-A (BPA), environmental toxin
- Hormone activity:
  - ↑ onset and incidence of DM II
  - Disrupts brain dopaminergic reward system in animals
- Linked to obesity and certain cancers

Slide 5

Does Intestinal Microflora Affect Weight?
Metagenomics: Genetics of intestinal microbial environments

Gut microbes break down indigestible foods
Transplanting gut microbes from normal to germ-free mice increased body fat without increase in food consumption

Slide 6

Gut Microbes Improve Efficiency of Energy Extracted from the Diet

N=12, >30 kg/m² adults
- Carb R
- Fat R
1 yr gut flora testing
Weight loss increased Bacteroidetes species (P=0.001) and decreased Firmicutes (P=0.002), irrespective of diet type
Slide 7

"ob/ob" microbiome has an increased capacity for dietary energy harvest

Slide 10

What Makes Us Eat More?

<table>
<thead>
<tr>
<th>Time Of Day</th>
<th>Conditioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sight</td>
<td>fMRI: brain patterns of liked foods are different than foods not liked</td>
</tr>
<tr>
<td>Smell</td>
<td>Induces insulin secretion which induces hunger</td>
</tr>
<tr>
<td>Refined carbohydrates</td>
<td>Cause a rapid decline in blood sugar</td>
</tr>
<tr>
<td>Variety</td>
<td>cravings</td>
</tr>
<tr>
<td>Temperature</td>
<td>Colder temperatures induces hunger</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Impairs judgment</td>
</tr>
</tbody>
</table>

Slide 8

Factors Influencing Food Intake

Slide 11

Similarities in nutrient-sensing mechanisms: taste-receptors and enteroendocrine cells

Intracellular Ca++ triggers neurotransmitters that relay information to the hindbrain

Slide 9

Should I…

Brain

Vagus Nerve

Exercise

Stomach

Eat

Shouldn’t I?

Slide 12

Neuropeptides

<table>
<thead>
<tr>
<th>Neuropeptides</th>
<th>Orexigenic</th>
<th>Anorexigenic agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>Neuropeptide Y (NPY) Melanin-concentrating hormone (MCH) Orexin/ hypocretin Agouti-related peptide (AGRP)</td>
<td>Cocaine and amphetamines regulated transcript (CART) Melanocortin 4 (POMC) Corticotropin releasing factor (CRF) Serotonin (5-HT) Neurotensin</td>
</tr>
<tr>
<td>Peripheral</td>
<td>Ghrelin</td>
<td>Peptide YY Cholecystokinin (CCK) Leptin Amylin Insulin Glucagon-like peptide (GLP-1) Bombesin Oxyntomodulin (OXM) Pancreatic polypeptide (PP)</td>
</tr>
</tbody>
</table>

Amy E. Foxx-Orenstein, DO, FACG
GLP-1: powerful incretin

- Release proportional to amount consumed
- Regulated by constituents consumed (fat, glucose)
- Multiple actions: ↑ gastric emptying, ↓ release of insulin and glucagon, ↓ appetite
- Basis for new DMT2 therapies (e.g., exenatide)

Hypothalamic orexigenic neuropeptides
- Neuropeptide Y
- Endocannabinoids
- Melanin-concentrating hormone
- Agouti-related peptide
- Orexins
- Galanin
- Endogenous opioids

Leptin: adipocyte derived hormone signals energy sufficiency
- Protein product of ob/ob gene
- Central and peripheral targets
- Circulates at levels proportional to body fat mass
- Glucose metabolism and PPAR influence leptin expression

Leptin acts on two distinct populations in the arcuate nucleus
- Stimulates POMC and CART
  - Reduces appetite
- Inhibits NPY and AgRP
  - Stimulates appetite by activating orexigenic NPY and inhibiting anorexigenic MC-4
- No leptin agonist or NPY antagonist in development

Endocannabinoids: endogenous lipids that regulate synaptic neurotransmission
- Derived from arachidonic acid
- G-protein coupled membrane receptors: CB1, CB2
- Wide distribution
- CB1 signaling mediates expression of orexigenic and anorectic mediators in the hypothalamus
- CB1 antagonist, Rimonabant™

Serotonin: central mediator of food intake

<table>
<thead>
<tr>
<th></th>
<th>Lorcaserin, (APD356)</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase Ia (4 weeks)</td>
<td>Dose</td>
<td>1 mg (n=75)</td>
</tr>
<tr>
<td>Mean Wt Δ, kg</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Phase Ib (12 weeks)</td>
<td>Dose</td>
<td>18 mg</td>
</tr>
<tr>
<td>Mean Wt Δ, kg</td>
<td>1.8</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Peripheral mechanisms targeted for weight loss – phase I-III

- Pancreatic Lipase inhibitor
- Cellstat (ATL-962)
- Human GH lipolytic fragment
- AOD9604, Phase II: FA oxidation and inhibits reesterification
- β3 adrenergic receptor agonist
- L-796568, induces thermogenesis
- Peptide-YY nasal spray
- Activates NPY/Agrp neurons; vagally mediated anorexia, intestinal L cells; low levels in obese
- Oxynatriuretin
- Mediated by GLP-1 energy intake and expenditure
- Ghrelin antagonists - none
- Leptin antagonists - none

Issues with High Energy GES for Obesity

Potential problems with high-energy GES
- Consumption of energy >> traditional stimulators
- Possible tissue adaptation (long-term efficacy)
- Potential side effects
A possible solution
- On-demand (timed) stimulation
- Individually optimized stimulation

Gastric Bypass

- Most effective obesity treatment
- Dual effect on weight loss:
  - induces malabsorption
  - alters appetite
- Effects of gut peptide release
  - Increase PYY
  - Increase oxyntomodulin
  - Increase GLP-1
  - Decrease ghrelin

Feedback-controlled GES

- Volume change to initiate GES
- Contraction or slow wave to control stimulator strength

Summary

- Improved understanding of the mechanisms that control appetite and energy balance
- High degree of redundancy does not preclude efficacy of treatment
- Modulation of satiety signals pharmacologically, surgically or electrically may curb this worldwide health threat
BMI > 30: WHAT’S NEXT?
Philip R. Schauer, MD

Slide 1: Bariatric Surgery is Standard of Care Treatment for Severe Obesity
Philip Schauer, MD
Professor of Surgery,
Cleveland Clinic Lerner College of Medicine
Cleveland, Ohio Schauer@ccf.org

Slide 4: Disproportional Increase in Severe Obesity
More than 1,000,000 U.S. adults now have a BMI >50

Slide 2: Obesity Treatment
- Founded 1983
- 3,000 members
  - 1,600 surgeons
  - 1,200 allied health professionals
- Mission: Advancing surgical treatment of severe obesity; patient care, research, education
- www.asmbs.org

Slide 5: A Guide to Selecting Treatment

BMI category
Treatment 25-26.9 27-28.5 29-34.9 35-39.9 ≥ 40

- Diet, physical activity, and behavior therapy
- With metformin
- Withlist
- Pharmacotherapy
- Withlist
- Surgery
- Withlist

Evaluation of Obesity Management
- Don’t confuse prevention with treatment
- Must measure effect of intervention
- Evidence based decisions
What is the medical evidence that lifestyle modification, dietary therapy, can be effective in treating severe obesity?

Change in Comorbidities N=104*

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>#</th>
<th>% Unchanged</th>
<th>% Improved</th>
<th>% Resolved</th>
</tr>
</thead>
<tbody>
<tr>
<td>OABVD</td>
<td>44</td>
<td>48</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>62</td>
<td>4</td>
<td>33</td>
<td>23</td>
</tr>
<tr>
<td>GERD</td>
<td>56</td>
<td>4</td>
<td>24</td>
<td>35</td>
</tr>
<tr>
<td>HBP</td>
<td>57</td>
<td>12</td>
<td>18</td>
<td>70</td>
</tr>
<tr>
<td>Sleep Apnea</td>
<td>44</td>
<td>5</td>
<td>19</td>
<td>74</td>
</tr>
<tr>
<td>Hypertensive glycaemia</td>
<td>43</td>
<td>14</td>
<td>29</td>
<td>35</td>
</tr>
<tr>
<td>Depression</td>
<td>36</td>
<td>37</td>
<td>47</td>
<td>8</td>
</tr>
<tr>
<td>Peripheral Edema</td>
<td>31</td>
<td>4</td>
<td>16</td>
<td>44</td>
</tr>
<tr>
<td>Urinary Incontinence</td>
<td>18</td>
<td>11</td>
<td>30</td>
<td>44</td>
</tr>
<tr>
<td>Asthma</td>
<td>18</td>
<td>12</td>
<td>69</td>
<td>15</td>
</tr>
<tr>
<td>Diabetes</td>
<td>18</td>
<td>0</td>
<td>18</td>
<td>82</td>
</tr>
</tbody>
</table>


Operations for Severe Obesity:2007

- Gastric Banding: 23%
- RY-Gastric Bypass: 75%
- BPD: 2%

Diabetes Surgery?

- Journal: Annals of Surgery
- Title: Who would have thought it? An operation proves to be the most effective therapy for adult-onset diabetes mellitus
- Authors: Pories WJ, Swanson MS, MacDonald KG, et al
- Key point: 
  - Surgery is more effective than medical therapy in treating diabetes
  - 83% of type 2 diabetic subjects euglycemic

Bariatric Surgery: A Systematic Review and Meta-analysis

- Excess Weight Loss:
  - All Patients: 61.2% (58.1%-64.4%)
  - Gastric Banding: 47.5% (40.7%-54.2%)
  - Gastric bypass: 61.6% (55.7%-66.5%)
  - Gastric restriction: 68.2% (61.5%-74.8%)
  - BPD/DS: 70.1% (66.3%-73.9%)
- Operative mortality (30 days):
  - Restrictive procedures: 0.1%
  - Gastric bypass: 0.5%
  - BPD/DS: 1.1%
- Comorbidity Resolution:
  - Diabetes: 76.8%
  - Hypertension: 70.0% (improved not resolved)
  - Hypertension: 61.7%
  - Obstructive sleep apnea: 85.7%

Gastric Bypass Effect on Diabetes

- 83% have remission of Type 2 Diabetes
- Dramatic reduction in medication requirement
- Patients with early disease have greatest potential for remission

*Schauer et al. Annals of Surgery Oct 2003*
Myths about Bariatric Surgery

1. Bariatric surgery is dangerous
2. Results are variable
3. Patients eventually regain their weight after surgery
4. Bariatric surgery is expensive
5. Patients may lose weight but it does not alter their life-span
6. Only surgeons endorse bariatric surgery

#1 Bariatric Surgery is Dangerous

Operative mortality (30 days)
- Restrictive procedures: 0.1%
- Gastric bypass: 0.5%
- BPD/DS: 1.1%
- Avg.: 0.28%

Buchwald et al. JAMA. 2004;292:1724-1737

#2 Results are Variable

Quality Assurance Programs from ASBS and ACS have established Center of Excellence Designations that ensure consistent and excellent results
**Slide 19**

**ASBS COE Requirements**
- Essential resources in place
- Adequate volume and experience
- Standardized procedures and care paths
- Long-term follow-up of 75% for five years
- Bariatric surgeons with proper coverage
- Reporting and sharing of outcomes according to templates
- Verified by site inspections

**Slide 20**

**ASBS Database Statistics**

<table>
<thead>
<tr>
<th>Performance of 176 Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Number of Patients</strong></td>
</tr>
<tr>
<td><strong>Hospital Mortality</strong></td>
</tr>
<tr>
<td><strong>Operative Mortality at 30 days (76 + 89 = 165)</strong></td>
</tr>
<tr>
<td><strong>Operative Mortality at 90 days (76+89+31 = 196)</strong></td>
</tr>
<tr>
<td><strong>Re-admissions</strong></td>
</tr>
<tr>
<td><strong>Re-operations</strong></td>
</tr>
</tbody>
</table>

**Slide 22**

#3 Patients eventually regain their weight after surgery

**Slide 23**

[Surgical Study Image]

**Slide 24**

[Graph: Weight Gain After Short- and Long-Limb Gastric Bypass in Patients Followed for Longer Than 10 Years]
**Slide 25**

Gastric Banding Long Term WT. Loss

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>12</th>
<th>24</th>
<th>36</th>
<th>48</th>
<th>60</th>
<th>72</th>
<th>84</th>
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<tbody>
<tr>
<td>Belachew et al. 2002(7)</td>
<td>763</td>
<td>64</td>
<td>50-60%*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>O’Brien et al. 2002(16)</td>
<td>506</td>
<td>47</td>
<td>51</td>
<td>84</td>
<td></td>
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<tr>
<td>Celso et al. 2002(11)</td>
<td>652</td>
<td>58</td>
<td>58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dingman, 1999 [12]</td>
<td>590</td>
<td>56</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topino et al. 1995 [21]</td>
<td>561</td>
<td>52</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fillingham et al. 1994 [18]</td>
<td>554</td>
<td>53</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Novich and Dunn, 1997(16)</td>
<td>526</td>
<td>60</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botteron et al. 1999(17)</td>
<td>520</td>
<td>65</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Percentage reduction of mean weight for patients with greater than 10% loss


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**Slide 28**

Cost Effectiveness of Weight Loss Surgery


The initial costs of surgery can be recouped in 3.5 years.

---

**Slide 26**

#4 Bariatric Surgery is Expensive

---

**Slide 29**

#5 Patients may lose weight but surgery does not alter their life-span

---

**Slide 27**

Cost Effectiveness of Weight Loss Surgery

Time to cost-saving.

- Pinkelstein BA et al. Am J Managed Care, 2006. Takes into account:
  - Additional days of work lost (5.1 days/yr)
  - Increased health expenditures ($22,230/yr) for obese patients.
  - Cost of surgery $20,000
  - Workdays required for recovery (15)
  - 75% decrease in obesity related costs after surgery

- After 5 years these operations become cost saving

---

**Slide 30**

Effect on Long-term Mortality Compared to Non-Operated Controls

<table>
<thead>
<tr>
<th>Study</th>
<th>Procedure</th>
<th>F/U</th>
<th>Mortality Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacDonald, 1997</td>
<td>RYGB</td>
<td>9 yrs</td>
<td>68%</td>
</tr>
<tr>
<td>Plum, 2004</td>
<td>RYGB</td>
<td>4.4 yrs</td>
<td>33%</td>
</tr>
<tr>
<td>Christou, 2004</td>
<td>RYGB</td>
<td>5 yrs</td>
<td>39%</td>
</tr>
<tr>
<td>Sorenson, 2007</td>
<td>RYGB</td>
<td>4.4 yrs</td>
<td>33%</td>
</tr>
<tr>
<td>O’Brien, 2006</td>
<td>LAGB</td>
<td>12 yrs</td>
<td>73%</td>
</tr>
<tr>
<td>Adams, 2007</td>
<td>RYGB</td>
<td>8.1 yrs</td>
<td>40%</td>
</tr>
<tr>
<td>Sjostrom, 2007</td>
<td>VBG/other</td>
<td>14 yrs</td>
<td>31%</td>
</tr>
</tbody>
</table>
#6 Only Surgeons Endorse Bariatric Surgery

“Never ask a barber if you need a haircut”

Warren Buffet

---

Poor Access to Surgical Treatment Nationwide

- Minority of 3rd party carriers cover bariatric surgery
- Carriers are withdrawing coverage eg. Florida BCBS
- Barriers commonly placed to deny coverage
- Employers believe that return on investment not realized

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Management of Severe Obesity

CMS National Coverage Decision Feb, 06
- Obesity is a disease
- Bariatric surgery is standard of care for severe obesity
- All Medicare patients have access

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Bariatric surgery is the only effective therapy for severe obesity
NIH consensus of 1991 concluded:
"Diet alone cannot be considered a reasonable option for permanent weight loss."

"Drug therapy for clinically severe obesity has been disappointing."

Surgical intervention including Roux-en-Y Gastric Bypass is the most appropriate treatments for obesity as defined by:
- BMI >40 or
- BMI >35 with co-morbidities

Access to Surgical Treatment of Severe Obesity Must be Improved

OR

- Disability of severe obesity will increase
- Mortality of severe obesity will increase
- Costs to treat comorbidity of severe obesity will increase
Obesity has become a major health problem in most industrialized nations. In the United States, obesity may be responsible for more than 300,000 deaths per year. Additionally, obesity has costs from medical expense and lost productivity that are estimated to exceed $100 billion per year. Obesity has particular relevance for gastroenterologists because of the associated causality of GI disorders such as cholelithiasis, pancreatitis, liver disease and GI cancers (particularly colon and esophageal). Additionally, gastroenterologists often evaluate and treat the GI-related anatomic and metabolic complications following surgery for obesity. Given the increasing utilization of bariatric surgery, it is key that GIs understand not only the anatomy of these surgeries, but the endoscopic appearances and appropriate intervention strategies.

Understanding the anatomy

Roux-en Y gastric bypass
This is the most commonly performed bariatric procedure in the U.S. The standard is for the creation of a small gastric pouch (typically less than 30 mL) the lesser curvature. The pouch is anastomosed to a Roux limb in an end to side fashion creating a gastrojejunostomy with a stomal diameter of approximately 10–12 mm. The length of the Roux limb is typically between 60–75 cm.

Laparoscopic adjustable silicone band
In this procedure, a band composed of an inflatable balloon is placed around the gastric cardia via the retroesophageal space and the angle of His. A catheter that leads from the Lap-Band is connected to a port reservoir which is implanted in the subcutaneous layer of the abdominal wall over the rectus fascia. This allows adjustment of the band to the desired degree of constriction.

Vertical banded gastroplasty
The VBG is a purely restrictive operation which is less commonly performed today. The key components include the creation of a vertically oriented gastric channel that has a volume of 15 mL or less and an outlet from the channel to the remainder of the stomach. There is a polypropylene mesh collar of silastic ring to prevent stomal dilation.

Biliopancretic diversion and duodenal switch
This surgery which is not commonly done, is primarily a malabsorptive procedure which creates a distal gastrectomy, which results in reduction of oral intake, and a long limb Roux-en-Y anastomosis with a short (approximately 50 cm) common alimentary channel.

A modification of this surgery is a duodenal switch procedure which uses a sleeve gastrectomy rather than distal gastrectomy.

Jejunal-ileal bypass
This procedure creates a defunctionalized segment of small intesting which drains into the colon with a short segment of duodenum (35 cm) attached to a the distal ileum (10 cm). This surgery is no longer done in the U.S. due to the myriad of metabolic complications.

Indications for endoscopy
1. Evaluation of symptoms: nausea, vomiting, unexplained abdominal pain, dysphagia.
2. Unexplained weight gain-evaluation for dehiscence or disruption.

Endoscopic principles
1. Know the anatomy before starting.
2. Discuss the surgery with the surgeon if possible (many modifications possible).
3. Review the operative report and all imaging studies available—prior to endoscopy.
4. Anticipate needs and insure necessary equipment is available.
5. Define appropriate time lines of intervention—in particular for sequential dilation of strictures.

REFERENCES
GI Complications of Bariatric Surgery: What the Endoscopist Needs to Know
Anatomy, Strictures, Ulcers

David A. Johnson MD FACG
Professor of Medicine
Chief of Gastroenterology
Eastern VA Medical School
Norfolk VA

GOALS/OUTLINE
- Magnitude of problem of obesity in US
- Operative strategies
- Endoscopic evaluation of post operative patient
  - Understanding anatomy
  - Indications for endoscopy
- GI complications of bariatric surgery
  - Recognition and management
- Develop clinical judgment/expand experience

BMI Categories

- Normal BMI
  - 18.5 – 24.9

- Overweight
  - 25 – 29.9

- Class I obesity
  - 30 – 34.9

- Class II obesity
  - 35 – 39.9

- Class III obesity
  - 40 Plus

Obesity Trends Among US Adult

Technical Term
Body Mass index (BMI) defined as

\[
\frac{\text{Weight in Kilograms}}{(\text{Height in Meters})^2}
\]

Obesity in the US: Magnitude of the problem
- 2004 prevalence: 60% obese or overweight
- 1 in 5 obese
- >6 million CLASS III obesity (BMI >40)
- 300,000 deaths per year
- $117 BILLION health care costs/yr
GI Complications of Obesity
GERD
- Strong relationship between obesity and GERD
- Overweight/Obesity increased prevalence:
  - GER symptoms
  - Erosive esophagitis presence
  - Erosive esophagitis severity
  - Barrett esophagus
  - Esophageal adenocarcinoma

GI Complications of Obesity
Elements and Vitamin Deficiency
- Calcium (duodenum/proximal jejunum)
- Vitamin D (jejenum/ileum)
- Fat soluble vitamins: esp. A and E
  - Most common post BPD
- Trace elements: rare
  - Magnesium, zinc, selenium
- Sensory and motor neuropathies


GI Complications of Obesity
- Metabolic
  - Fatty liver disease (NASH/NAFLD)
  - Gallstones
  - Pancreatitis
- Degenerative
  - Cryptogenic cirrhosis

GI Complications of Obesity
- Thiamine deficiency
- Wernicke’s Encephalopathy
  : Developed 2-18 months post op
- Classic triad
  : ataxia, confusion, nystagmus
  : evident in only 20%
- Other symptoms/signs: seizures, asterixis
- Clinical setting of intractable vomiting

Neurology 2007;68:897-11

Absorptive Complications: Gastric Bypass
- Iron deficiency: common
- B12 deficiency: common
  - Reported also for the restrictive surgeries
- Trace element deficiency rare
  - More common in long segment exclusions
  - Present with neuropathy/muscular weakness
- NJ bypass steatosis/encephalopathy issues


GI Complications of Obesity
- Neoplastic
  - Esophageal
  - Colon
  - Gallbladder
  - Pancreatic
  - Hepatocellular

ALTERATIONS IN:
- Hormones
- Cytokines
- Neurotransmitters
- TNF
- Adiponectin
- Insulin Resistance
- Leptin
- Angiotensionogen
- Resistin
- Leptin
Operative Strategies: Bariatric Surgery

- Global malabsorption
  - J1 bypass
- Pure restriction
  - Vertical banded gastroplasty
  - Laparoscopic adjusted silicone gastric band
- Combined restriction/minimal malabsorption
  - Roux-en-Y gastric bypass
- Selective malabsorption and malabsorption
  - Bilio-pancreatic diversion (BPD)

Restrictive Surgery: Vertical Banded Gastroplasty (VBG)

- Vertical gastric pouch
- Calibrated to 15 cc
- Reinforced mesh collar
- Laparoscopic approach possible
- Significant dietary restrictions needed
- Dilation rarely effective

Bariatric Surgery Indications

- NIH consensus panel
  - BMI > 40 kg/m²
  - Failed non-surgical methods
- Selected circumstance (35–40 kg/m²)
  - Comorbid conditions

Restrictive Surgery: Lap. adjustable silicon gastric band

- Newest attempt
- “Minimally invasive”
- Silicone collar
  - Prevents erosion
- Ability to adjust gastric outflow tract

Jejunoileal Bypass

- Defunctionalized segment drains into sigmoid colon
- Bacterial overgrowth risk
- Cirrhosis/hepatic failure
- High nutrient/vitamin malabsorption risk
- No longer performed
- Colonoscopy before conversion

Roux-en-Y Bypass

- Combines restriction minimal malabsorption
- Most frequently done
- 30 cc gastric pouch
- 1 cm anastomosis to jejunum
- Length typically 75 cm
  - Longer (150) for super-morbid BMI > 50
- Dumping syndrome if large sugar content
Biliopancreatic diversion
- No blind limb
- avoids overgrowth
- Selective malabsorption
- fat/starch
- Biliary/pancreatic secretion enters distally
- 50 cm common channel
- Super obese
- Need fat soluble vitamins

Bariatric Surgery Complications
- **Late: > 30 days**
  - Anastomotic stricture
  - Bowel obstruction
  - GI or intra-abdominal bleeding
  - Cholelithiasis
  - Incisional hernia
  - Marginal ulceration
  - Dehisence/fistulization
  - Nutritional deficiencies

Bariatric Surgery in U.S.

<table>
<thead>
<tr>
<th>Year</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>12,775</td>
</tr>
<tr>
<td>2002</td>
<td>70,295</td>
</tr>
<tr>
<td>2005</td>
<td>140,000</td>
</tr>
</tbody>
</table>

Arch Surg 2005;140:1198-1202

Risks of Bariatric Surgery Incidence Data
- 10-20% patients require f/u operations to correct complications
  - Abdominal hernia most common
- 30% develop nutritional deficiencies
  - Anemia, osteoporosis, metabolic bone disease
  - Vitamin and trace element deficiency

Pre-Endoscopic Evaluation of the Post Operative Bariatric Patient
- Know the anatomy!
- Discuss with the surgeon if possible
  - Modifications are common!
- Review all imaging studies
- Select the equipment and accessories to meet the need
- Set appropriate goals and time frames

David A. Johnson, MD, FACG
**Slide 25**

**Bariatric Surgery**
**Endoscopic Evaluation**

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**Slide 26**

**Indications for Endoscopy**
**Postoperative Bariatric Patient**
- Evaluation of symptoms
- Management of complications
- Evaluation of failure of weight loss

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**Slide 27**

**Nausea and Vomiting**
- Nausea extremely common
- Vomiting
  - Most commonly due to inappropriate eating habits
  - Large volumes or bolus site
  - Remember low volume preps for colonoscopy
- Intractable vomiting
  - Protein calorie malabsorption / Wernicke's / neuropathy
  - Remember THIAMINE before glucose!

J Clin Gastroenterol 1987;5:549-52
Obes Surg 2002;12:213

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**Slide 28**

**Abdominal/Retrosternal Pain**
- Think stomal ulceration
- If prosthetic device - erosion

Obes Surg 1998;8(5):505-16

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**Slide 29**

**Stomal Complications:**
**Gastric Bypass**
- Stomal ulceration 2-16%
- Stenosis 9-20%
- Risks of development highest first 2 months
- Gastrografin studies with the first 2 weeks?
- Usually managed by conservative therapy
  - Pharmacologic/endoscopic

Obes Surg 1998;8(5):505-16

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**Slide 30**

**Stomal Ulceration**
- Most commonly staple line failure
  - Development of fistula
- NSAID use
  - Overt or surreptitious
- Ischemia at anastomosis site
- Bleeding risk

Amer Surg 1991;57:286-8
Obes Surg 2002;12:30-3
Slide 31

**KEY POINT**

Anastomotic Stricture Dilation  
Higher risk: Go SLOWLY

Slide 34

**Failure to lose weight**

- Remember eating disorders  
- Fistulization  
- Dehiscence

Slide 32

**GI Bleeding: Roux-en-Y Bypass**

- Stomach distal to anastomosis difficult to image  
  - Patients should avoid NSAIDs  
- Bleeding is uncommon  
  - Blunted gastrin release due to eating  
  - Abnormal vagal secretory response  
  - Practically no acid in pouch  
- Bypassed stomach reachable  
  - Pediatric colonoscope or duodenoscope

_Gastrointest Endosc 2003;57:86-94_

Slide 35

**Forthcoming Endoscopic Management Strategies**

Lest we throw stones.....

- Space occupying devices (remember Garrin?)  
  - Bariatric intragastric balloon (BioEnterics)  
  - Bowtie (Wilson Cook)  
- Ulceration (1-30%)  
- Obstruction (1-3%)  
- Perforation (1%)

_Gastroenterol Clin NA 2005;143-50_

Slide 33

**Gastric Cancer Risk**

- Not appear to be associated with gastric CA  
- Only 3 cases reported  
- No recommendations-routine surveillance

_Obes Surg 2002;12:118-20  

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**Forthcoming Endoscopic Management Strategies**

Lest we throw stones.....

- Gastric reduction/partitioning  
  - Endocinch (Bard)  
  - Eagle Claw (Olympus)  
  - TOGA (Satiety)  
  - ? (Endogastric Solutions)
Slide 37

**Conclusions - Bariatric Surgery**  
**Issues for the Gastroenterologist**

- Prevalence of obesity
- GI complications - without surgery
- GI complications - with surgery
- Rationale for management

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Slide 38

**Conclusions - Bariatrics**  
**GI Complication Management**

- Rule 1 - Understand the anatomy  
- Rule 2 - Do not forget rule #1  
- Rule 3 - Have appropriate equipment  
- Rule 4 - Set appropriate goals (especially for dilation)  
- Rule 5 - Stand by for future problems we may create...with endo therapies
Facts About Obesity

Courtesy of the Campaign to End Obesity

**America’s Obesity Epidemic**
- The 2003-2004 NHANES survey found that an estimated 66 percent of U.S. adults are either overweight or obese
- The rate of childhood obesity more than doubled from 1980 to 2000
- More than 9 million children are overweight or obese

**The Economic Impact of Obesity**
- According to *Health Affairs* Journal and RAND, 83 cents of every health care dollar in America is spent on a patient that is overweight or obese
- According to the Department of Health and Human Services, the total cost of obesity in the U.S. is $117 billion each year
- Statistics from the National Business Group on Health indicate that obesity was responsible for 39 million lost work days and 63 million physician visits

**Obesity and Physical Activity**
- 52 percent of adults do not meet minimum physical activity recommendations
- Only 35.8 percent of high school students are physically active 60 minutes or more, 5 days per week; only 33 percent attend physical education classes daily

**Obesity and Nutrition**
- Only 12 percent of adults and 2 percent of children eat a healthy diet consistent with federal nutrition recommendations
- According to the USDA, healthier diets could prevent at least $71 billion per year in medical costs, lost productivity and lost lives

**Obesity Risk for Minority Populations**
- Nearly 30 percent of Mexican-American men are obese
- 81.6 percent of black women and 75.4 percent of Mexican-American women are overweight or obese compared to 58 percent of white women
- Type 2 diabetes affects half of the Pima Indians

**Obesity’s Impact on America’s Health**
- According to the American Cancer Society, obese adults are at increased risk for all cancers especially endometrial, gall bladder, uterine, ovarian, colorectal and prostate
- According to the CDC, obesity contributes to two-thirds of all heart disease
- Over 75 percent of hypertension cases are directly related to obesity
- More than 80 percent of people with type 2 diabetes are overweight

Source: [http://obesitycampaign.org/obesity_facts.asp](http://obesitycampaign.org/obesity_facts.asp)