



Let's Define Obesity

Obesity is a disease of excess fat:

- Caused by many factors
- Risk for diabetes, heart disease, high blood pressure and other diseases
- Progressive
- Can be life threatening
- Costly
 - Lost wages
 - Medical bills

National Institute of Health, 2010


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Obesity Statistics


- 68% of Americans are overweight or obese
- 34% of those are considered obese
- Since 1980, the prevalence of morbid obesity has quadrupled
- Kentucky ranks 6th in the country for highest adult obesity rates, with 31.5% of population qualifying as obese


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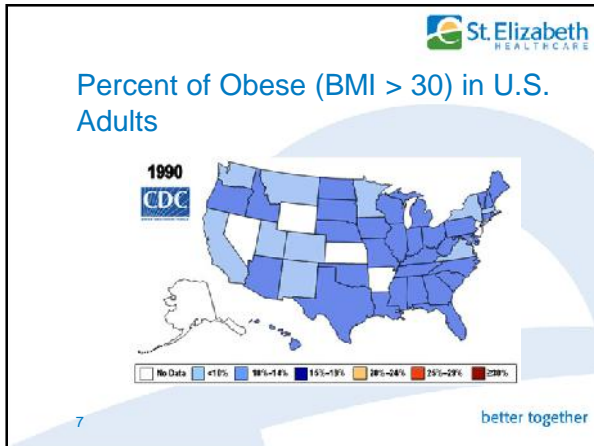
Percent of Obese (BMI > 30) in U.S. Adults

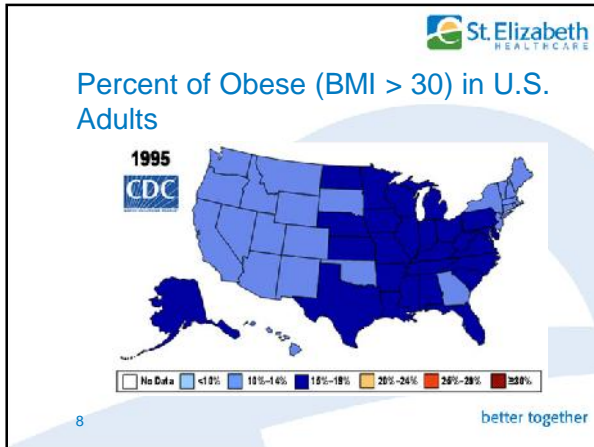
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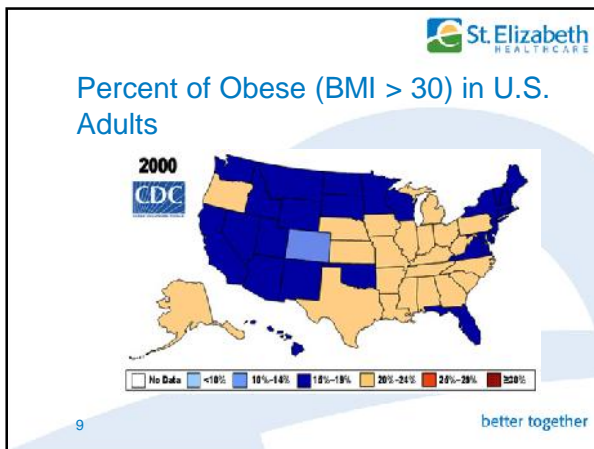


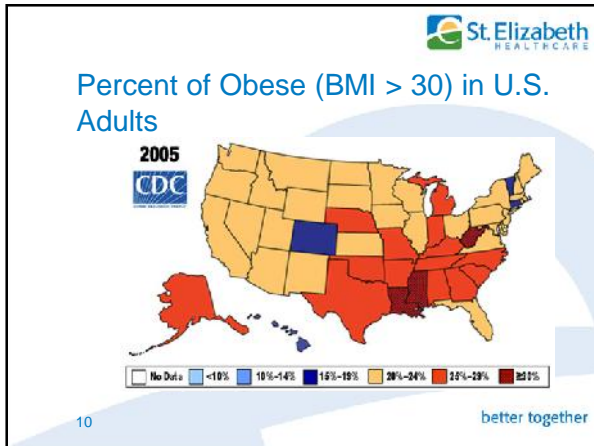


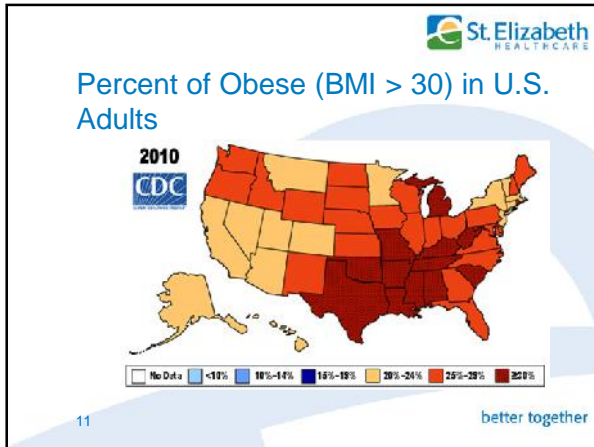
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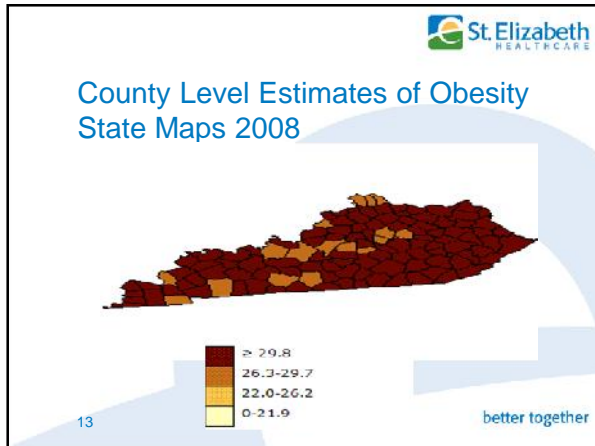


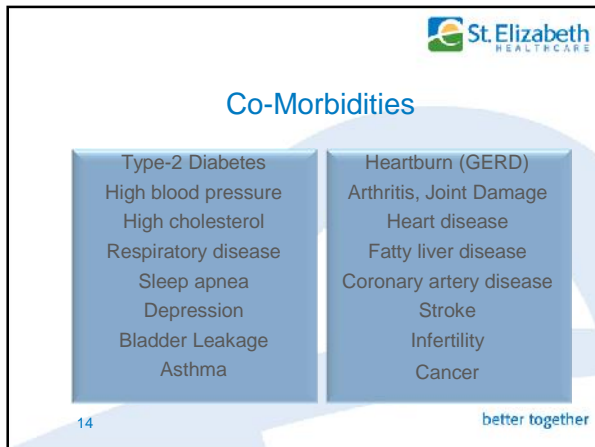


2010 State Obesity Rates

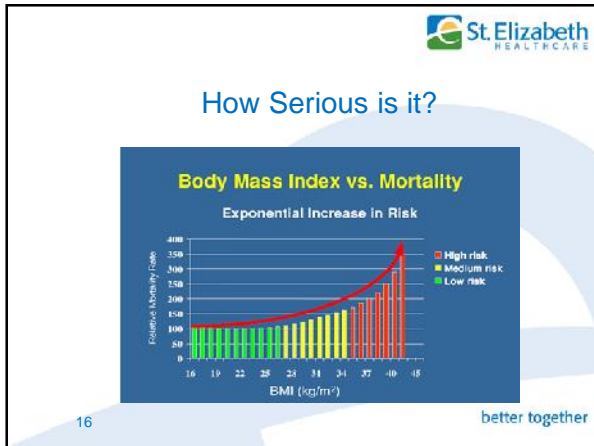
State	% State	% State	% State	% State			
Alabama	32.2	Illinois	28.2	Montana	23.0	Rhode Island	25.5
Alaska	24.5	Indiana	25.6	Nebraska	26.9	South Carolina	31.5
Arizona	24.3	Iowa	26.4	Nevada	22.4	South Dakota	27.3
Arkansas	30.1	Kansas	29.4	New Hampshire	25.0	Tennessee	30.9
California	24.0	Kentucky	31.3	New Jersey	23.8	Texas	31.0
Colorado	21.0	Louisiana	31.0	New Mexico	25.1	Utah	22.5
Connecticut	22.5	Maine	26.8	New York	23.9	Vermont	23.2
Delaware	28.0	Maryland	27.1	North Carolina	27.8	Virginia	26.0
District of Columbia	22.2	Massachusetts	23.0	North Dakota	27.2	Washington	25.5
Florida	26.6	Michigan	30.9	Ohio	29.2	West Virginia	32.5
Georgia	29.6	Minnesota	24.8	Oklahoma	30.4	Wisconsin	26.3
Hawaii	22.7	Mississippi	34.0	Oregon	26.8	Wyoming	25.1
Idaho	26.5	Missouri	30.5	Pennsylvania	26.6		

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National Estimated Cost of Obesity

- The medical care costs of obesity in the United States are staggering. In 2008 dollars, these costs totaled about **\$147 billion** (Finkelstein, 2009).

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The Brain

- **CNS changes in obesity are less well known, although studies suggest a link between certain degenerative brain disease and obesity**


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The Obesity/Brain Association

- Studies concerning degenerative brain diseases support the idea that obesity has a negative impact on brain function
- Increased body wt. is known to be a risk factor for cognitive decline and AD
- The association between obesity and dementia is independent of other comorbid conditions.


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The Obesity/Brain Association


- Central obesity may also be associated with a high risk of other neurologic disorders such as Parkinson's disease
- Studies are supporting the idea that obesity has a negative impact on brain function.
- Obesity may disrupt cognition, with deficit in learning, memory, and executive function

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Brain Structural Changes with Obesity


- Both age and obesity were associated with decrease in brain volume
- Seems to be seen mainly in the frontal lobe
- Enlarged orbitofrontal white matter
- Decrease in focal grey matter volume
- Due to frontal lobe white matter being more prone to the affects of aging other than other lobes could reflect accelerated aging in the obese person.

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Brain Disorders Associated with an Increase of IR/Diabetes and/or Obesity


- Psychiatric Disorder
 - Schizophrenia
 - Bipolar Disorder
 - Major Depressive Disorder
- Neurodegenerative Disease
 - Alzheimer's Dementia
 - Vascular Dementia
 - Parkinson's Disease
 - Huntington's Disease

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Other Brain Changes

- Normal and pathological conditions such as nutrients, oxygen, inflammatory factors, stress and hormones, have immediate impact on the brain.
- Obesity is considered a state of chronic low grade inflammation. chronic obesity is associated with abnormal insulin, cytokine, adipokine(leptin and resistin) function.


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Other Brain Changes

- Recent studies have suggested that obesity could change the area of the brain that helps control appetite and body weight(hypothalamus):
 - Changes could start as early as a day of eating a high fat meal
 - May explain why so hard to keep the weight off
 - Results from inflammation of the hypothalamus after just 1 day of high fat meal
 - After a week body mounts a defense by call cells that repair and protect
 - The inflammation subside
 - Then returns after about a month and then continues


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Other Brain Changes

- Studies cont.:
 - Upon trying to correlate these findings to humans it was found that obese individuals had more of the repair activity in the hypothalamus then lean individuals.


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Now and the Future of Obesity and the Brain

- Individuals may have a greater extent of brain atrophy due to obesity or due to factors that promote obesity and that atrophy may predispose them to future cognitive impairment and dementia.
- Implications include
 - Amplified morbidity/mortality in the elderly
 - Higher health care cost
 - Emotional and other non-financial burden of caretakers and healthcare providers


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Now and the Future of Obesity and the Brain

- In some studies it has shown some partial reversibility in the structural abnormalities with dieting.


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Conclusion

- It is important to continue to strive to get a better understanding the mechanism by which nutrition and in particularly obesity can affect neuroplasticity and cognitive function.
- There is compelling evidence that obesity modulates brain responses and may accelerate brain aging and age related neurodegeneration


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Conclusion


- Even though it is not known how obesity disrupts the brain homeostasis during aging, many studies both human and rat have strongly linked diet induced metabolic disturbances
- Further studies need to be initiated to better understand the relationship between obesity and the way it impacts brain functioning.

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**HOW DO WE MANAGE OBESITY
AT ST. ELIZABETH WEIGHT
MANAGEMENT CENTER**


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Preoperative Nutritional Assessment

1. Anthropometrics
2. Weight history
3. Medical history
4. Labs
5. Psychological evaluation
6. Dietary intake: food/water
7. Physical activity
8. Psychosocial
9. Postoperative intake

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"I try to eat healthy. I never sprinkle salt on ice cream, I only eat decaffeinated pizza, and my beer is 100% fat free."



Anthropometrics

- **Body Composition**
 - Body Fat % and lbs.
 - Muscle mass % and lbs.
 - Body water % and lbs.
- **Body area measurements:**
 - Neck
 - Chest
 - Arms
 - Waist
 - Hips
 - Legs

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Weight History


- **Nutritional History**
 - Occupation
 - Are you currently following any particular diet
 - Food cravings
 - Food allergies and avoidance
 - Body weight history : highest/lowest/usual/birth weight
 - Prior weight loss attempts including medications
 - Eating habits:
 - ◊ Skipped meals
 - ◊ Snacks
 - ◊ Meal planning
 - ◊ Grocery shopping
 - ◊ Who prepares the meals
 - ◊ Eating outside the home

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- Eating habits: (cont.)
 - ◊ Do they read food labels
 - ◊ ? Eat in the car
 - ◊ ? Eat watching TV
 - ◊ ? Eat when stressed, bored, anxious, lonely
 - ◊ ? Eat when they are not hungry
 - ◊ ? Awaken hungry in the middle of night
 - ◊ Are there some foods that you find impossible to stop eating once started
 - ◊ Do you clean your plate even if already full?
 - ◊ Do you use food as a reward?
 - ◊ Do you feel sometimes your eating is out of control
 - ◊ Is income a factor in your selection of food
- Beverage consumptions
 - ◊ Water
 - ◊ Juice
 - ◊ Soda
 - ◊ Iced tea
 - ◊ Milk
 - ◊ Coffee
 - ◊ Alcohol


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Medical History

- Present status:
 - Are you in good health at present time?
 - Are you under a doctor's care at present time?
 - Are you taking any medications?
 - ◊ Prescription Medications
 - ◊ Over-the-Counter Medications
 - Vitamins
 - Supplements
 - Asa
 - Allergies:
 - ◊ Medications
 - ◊ Latex
 - ◊ Seasonal
- Serious Injuries


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Medical history

- Previous Bariatric Surgery
 - Type
 - Date
 - Original weight
 - Lowest weight
 - Any complications?
- Non-Bariatric Surgical History
- Family History


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Medical History

- Gynecologic History:
 - Pregnancies
 - Delivery type
 - Menstrual history
 - ?pcos
 - Hormone Replacement
 - BCP's
 - Last checkup date
- PMH check list questionnaire
- Tobacco History


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Labs

CBC	Zinc
CMP	Thiamine
Lipid Profile	PreAlbumin
TSH	TIBC
Free T3	Folate/RBC
Free T4	Ferritin
HgA1C	Serum Iron
Fasting Insulin	Cortisol
Vitamin D 25OH	
Vitamin B12	
Vitamin A	


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Other Testing

- EKG as per MD/Insurance requirement
- Cardiac clearance as per MD/Insurance
- Pulmonary clearance as per MD/Insurance
- Sleep Study as per MD
- EGD/UGI/H.pylori as per Insurance


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Psychological Evaluation

- Functional/educational/psychosocial History
 - Are you able to read and write?
 - Highest level of education
 - How do you learn best?
 - Limitations to learning
 - Learning disabilities
 - Speak and understand English?
 - Any vision loss?
 - Any hearing loss?
 - Any speech limitations?
 - Any physical limitations?
 - Able to perform the activities of daily living?


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Psychological Evaluation

- Individual evaluation with Clinical Psychologist
- Full psychosocial history
- DSM IV Diagnosis
- R/O eating disorders/substance abuse
- Evaluate patients readiness for change


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Dietary Intake: Food/Drink

- Assess skipped meals
- Time of day and types of food typically eat
 - Breakfast /Lunch/Dinner/Snack
- Patient Food and Activity Log
 - Minimal 3 days
- Beverage Intake: (number servings per day)
 - water
 - Soda
 - Juice
 - Iced tea
 - Milk
 - Coffee
 - Alcohol


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Physical Activity

- Activity Level:
 - **Inactive** - no regular physical activity with sit down job
 - **Light** - no organized physical activity during leisure time
 - **Moderate** - occasionally in activities such as weekend golf, tennis, jogging, swimming, cycling
 - **Heavy** - consistent lifting, stair climbing, heavy construction, etc., or regular participation in jogging, swimming, cycling, or active sports at least three times per week
 - **Vigorous** - participation in extensive physical exercise for at least 60 minutes per session 4 x per week
- Activity Log

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DECISION BETWEEN MEDICAL VS SURGICAL INTERVENTION


- Both pathways are available through the same center.

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INDIVIDUALIZED PROGRAM


- Initial patient work up drives individualized program
- Metabolic indicators impact type of dietary modification
- Past history and current weight drive exercise prescription
- Social and psychological patient report determines counseling and/or psych referral needs.

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FOLLOW UP


- Frequently scheduled office visits during weight loss phase.
- Regularly scheduled laboratory testing at key intervals to determine metabolic changes.
- Individualized plans developed for maintaining weight loss.
- Individualized recovery plans developed if any weight gain occurs.


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Customized Plan: One Size does not fit all


Very Low Calorie Diet (VLCD)	Low Calorie Diet (LCD)
Men: 800-1000 kcalories Women: 600 -800 kcalories	Men: ≥ 1200 kcalories Women: ≥ 1000 kcalories
All products	Combination of products and meals

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Customized Plan

Very Low Calorie Diet (VLCD)	Low Calorie Diet (LCD)
Indications: BMI ≥ 30 ≥ 40 pounds to lose (F) > 50 pounds to lose (M)	Indications: ≥ 10 pounds to lose
Weight Loss Averages: 4-7 pounds the first week 2-3 pounds per week	Weight Loss Averages: 2-3 pounds the first week 1-2 pounds per week

50 



Surgical Options Available

- **Center of Excellence** Bariatric Surgery Program
- Separate **Free** Informational Seminars for Surgery
- Insurance-Required Diet Trial Program Now Available

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Are You a Candidate for Weight Loss Surgery ?

- BMI of 40
- BMI of 35-39 with significant co-morbidities
- Dietary attempts not working

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BMI DETERMINATION

Weight Category	BMI (kg/m ²)
Healthy Weight	18.5-24.9
Overweight	25-29.9
Obese	30-34.9
Severely Obese	35-39.9
Morbidly Obese	40

	Height (ft/in)									
	4'9"	4'11"	5'1"	5'3"	5'5"	5'7"	5'9"	5'11"	6'1"	6'3"
154	33	31	29	27	26	24	23	22	20	19
165	36	33	31	29	28	26	24	23	22	21
176	38	36	33	31	29	28	26	25	23	22
187	40	38	36	33	31	29	28	26	25	24
199	43	40	37	35	33	31	29	28	26	25
209	45	42	40	37	35	33	31	29	28	26
220	48	44	42	39	37	35	33	31	29	28
231	50	47	44	41	39	36	34	32	31	29
243	52	49	46	43	40	38	36	34	32	30
254	55	51	48	45	42	40	38	35	34	32
265	57	53	50	47	44	42	39	37	35	33
276	59	56	52	49	46	43	41	39	37	35
287	62	58	54	51	48	45	42	40	38	36
298	64	60	56	53	50	47	44	42	39	37
309	67	62	58	55	51	48	46	43	41	39
320	69	64	60	57	53	50	47	45	42	40


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Are You a Candidate?


Normal Weight (BMI 18 to 24.9)




Overweight (BMI 25 to 29.9)




Obese (Class I) (BMI 30 to 34.9)



Severely Obese (Class II) (BMI 35 to 39.9)




Morbidly Obese (Class III) (BMI 40 or more)




54 * BMI (Body Mass Index): A measurement of an individual's weight in relation to height (kg/m²). Allergan (2011)

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How Surgery Works

- Mal-absorption
 - Bypass small intestine
 - Absorb fewer calories
- Restriction
 - Reduce size of stomach



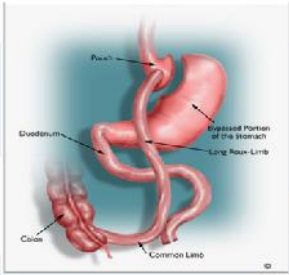
National Institute of Health (2011) **better together**

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Roux-en-Y Gastric Bypass

- Gold Standard
- First surgery performed in 1967
- First laparoscopic surgery 1983



National Institute of Health (2011) **better together**


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How Does the Gastric Bypass Work?

Surgery factors:


- Smaller meals (restriction)
- Fewer calories absorbed
- Decreased appetite



Patient factors:

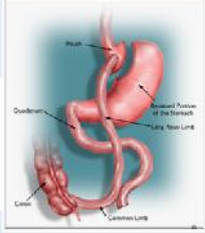
- Calorie intake
- Exercise

57 • Behavior changes **better together**




Complications of Gastric Bypass

- Intestinal leakage 0.6%
- Blood clot <1%
- Obstruction 1.6%
- Death 0.1%



Sekhar et al (2007)

58 better together

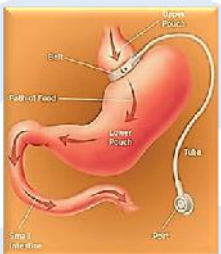


Laparoscopic Adjustable Gastric Banding (LAGB)

Lap Band® (Allergan)


- FDA approved 2001
- Realize® (Ethicon)
- FDA approved 2007

Most common bariatric operation (2009)



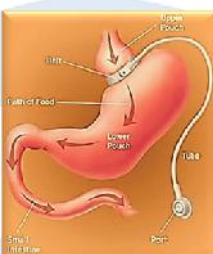
Allergan (2010)

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How Does LAGB Work?


- Surgery factors:
 - Smaller meals (restriction)
 - Decreased appetite
- Patient factors:
 - Calorie intake
 - Exercise
 - Behavior changes



Allergan, 2010

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Laparoscopic Adjustable Gastric Banding



Advantages

- No stomach stapling, cutting, or intestinal rerouting
- Low surgical complication rates
- Low malnutrition risk
- Adjustable—customized per patient
- Reversible
- Minimally invasive
- Makes you feel full (satiety)
- Needs an overnight hospital stay


Disadvantages

- Slower initial weight loss than gastric bypass
- Regular follow-up and adjustments critical for optimal results
- Requires implanted medical device

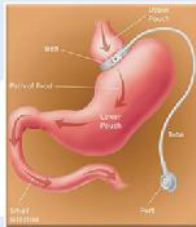
Allergan (2011)

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Complications of Banding




- Band prolapse <3%
- Port/tubing problem <5%
- Band Erosion <1%
- Death .05%



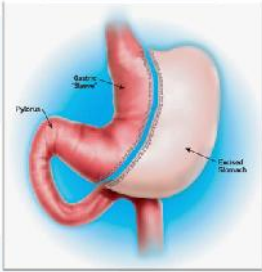
National Institute of Health (2011)

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Sleeve Gastrectomy




- Offered Since 2010
- Insurance coverage varies
- Medium range research data available
- ASMBS endorsed operation as primary option



ASMBS (2011)

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How Does the Sleeve Work?

- Surgery factors:
 - Smaller meals (restriction)
 - Decreased appetite
- Patient factors:
 - Calorie intake
 - Exercise
 - Behavior changes

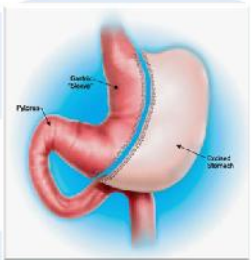
ASBMS (2011)

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Complications of Sleeve

- Leaks 1.2%
- Bleeding 1.6%
- Stricture 0.9%
- Death 0.24%



ASBMS, 2011

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Review of Procedures

Procedure	Laparoscopic Adjustable Gastric Banding (LAGB)	Roux-en-Y Gastric Bypass (RYGB)	Laparoscopic Sleeve Gastrectomy
	<ul style="list-style-type: none"> ➢ No change in the anatomy or stomach stapling is required ➢ Regular follow-ups allow for optimal results 	<ul style="list-style-type: none"> ➢ Requires cutting and stapling of stomach and bowel 	<ul style="list-style-type: none"> ➢ Requires cutting and stapling of stomach
Short-term (1 year) excess weight loss	<ul style="list-style-type: none"> ➢ 49.6% average excess weight loss approximately 11 months (48 weeks) after surgery 	<ul style="list-style-type: none"> ➢ 67% average excess weight loss 1 year after surgery 	<ul style="list-style-type: none"> ➢ 46% to 83% excess weight loss 1 year after surgery
Long-term (> 5 years) excess weight loss	<ul style="list-style-type: none"> ➢ 55% average excess weight loss 5 years after surgery 	<ul style="list-style-type: none"> ➢ 58% average excess weight loss 5 years after surgery 	<ul style="list-style-type: none"> ➢ No follow-up reported >3years ➢ May require second surgery

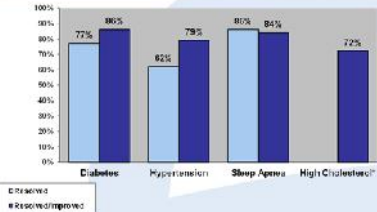
ASBMS (2011)

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Resolving other Health Conditions


Following bariatric surgery, most patients resolve or improve their co-morbid conditions



Condition	Resolved/Improved	Resolved
Diabetes	80%	77%
Hypertension	79%	82%
Sleep Apnea	84%	80%
High Cholesterol	72%	0%

Buchwald, et al. JAMA Oct 2004

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Obesity classification

BMI = $\text{wt. in Kg} / \text{ht. in m}^2$ or $\text{wt. in lbs.} / \text{ht. in inches}^2 \times 703$

BMI in kg/m ²	Classification	Risk
Below 18.5	underweight	
18.5-24.9	normal range	low
25.0-29.9	overweight	guarded
30-34.9	obesity class 1	elevated
35-39.9	obesity class 2	high
40 +	obesity class 3	severe

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THANK YOU

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