GEORGIA DIABETES SYMPOSIUM

FOR HEALTH PROFESSIONALS

Saturday, November 12, 2016

8:30am-5:00pm

Atlanta Marriott Marquis

265 Peachtree Center Ave NE,

Atlanta, GA 30303

Disclosures to Participants

Requirements for Successful Completion:
For successful completion, participants are required to be in attendance in the full activity, complete and submit the program evaluation at the conclusion of the educational event.

Conflicts Of Interest and Financial Relationships Disclosures

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Activity-Type : Knowledge-based

This continuing nursing education activity was approved by The American Association of Diabetes Educators, an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation. This program **2016-054** is awarded **6.0** contact hours of continuing education credit.

The AADE is also accredited by the California Board of Registered Nursing (CEP#10977).

The American Association of Diabetes Educators is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. This program provides **6.0** contact hours **(.60 CEU's)** of continuing education credit.

ACPE Universal Activity Number: 0069-0000-16-255-L01-P; 0069-0000-16-256-L01-P; 0069-0000-16-257-L01-P; 0069-0000-16-258-L01-P; 0069-0000-16-259-L01-P; 0069-0000-16-260-L01-P; 0069-0000-16-261-L01-P; 0069-0000-16-263-L01-P; 0069-0000-16-264-L01-P; 0069-0000-16-265-L01-P

Effective Date: November 12, 2016 to November 12, 2017

Sponsored by The Diabetes Association of Atlanta, a designated provider of continuing education contact hours (CECH) in health education by the National Commission for Health Education Credentialing, Inc. This program is designated for Certified Health Education Specialists (CHES) and/or Master Certified Health Education Specialists (MCHES) to receive up to **6** total Category I continue education contact hours.

WellStar Comprehensive Bariatric Services

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Medical Group

Bariatric & Metabolic Surgery for the Treatment of Metabolic Disorders

- Discuss the current surgical options available for the treatment of morbid obesity and obesity related co-morbidities including Type 2 diabetes.
- Discuss the physiological changes created with bariatric surgery and how they may lead to metabolic improvements

Bariatric Surgery and Diabetes

- What is obesity?
  - Conditions linked to obesity
- What is bariatric and metabolic surgery?
  - History
  - Operations
- How is diabetes affected?

Obesity

- From French **obésité**, which is from Latin obesitas, which means "**fatness**," and from obesus, which means "something that's eaten itself fat." Roots are from "**ob**" (which means over) and "**edere**" which means to eat.

Obesity

- More than one-third of the U.S. adult population suffers with obesity.
  - The prevalence of obesity was **36.5%** (crude estimate) among U.S. adults during 2011–2014[(1)].
- Obesity-related conditions include heart disease, stroke, type 2 diabetes and certain types of cancer, some of the leading causes of preventable death.
- The estimated annual medical cost of obesity in the U.S. was $147 billion in 2008 U.S. dollars; the medical costs for people who are obese were $1,429 higher than those of normal weight

Definitions

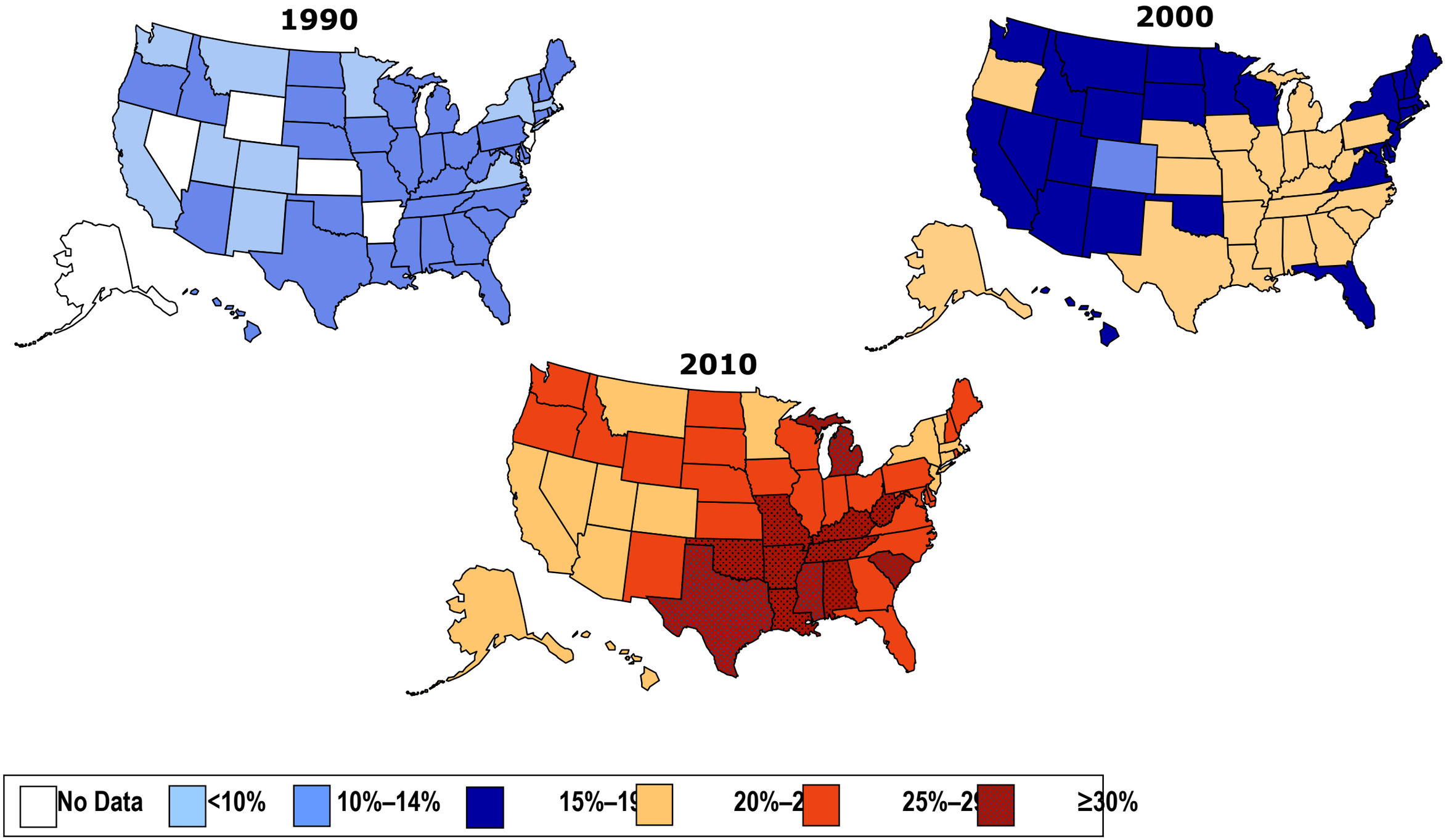
- BMI = **Body Mass Index**
  - Example: A person who is 5 feet 5 inches and weighs 250 pounds has a BMI of roughly 40
- **Overweight**
  - Body Mass Index > 25
- **Obese (Class 1)**
  - BMI > 30
- **Obese (Class 2)**
  - BMI > 35
- **Severe or "Morbid" Obesity (Class 3)**
  - BMI > 35 with medical problems
  - BMI > 40
  - More than 100 pounds over Ideal Body Weight
- **Super Morbid Obesity BMI>50**

Agency for Healthcare Research and Quality. Screening for obesity in adults. Accessed June 22, 2010 from http://www.ahrq.gov/clinic/3rduspstf/obesity/obeswh.htm
Dugdale DC. Obesity. MedlinePlus. Accessed June 22, 2010 from http://www.nlm.nih.gov/medlineplus/ency/article/007297.htm

Obesity Trends* Among U.S. Adults

BRFSS, 1990, 2000, 2010

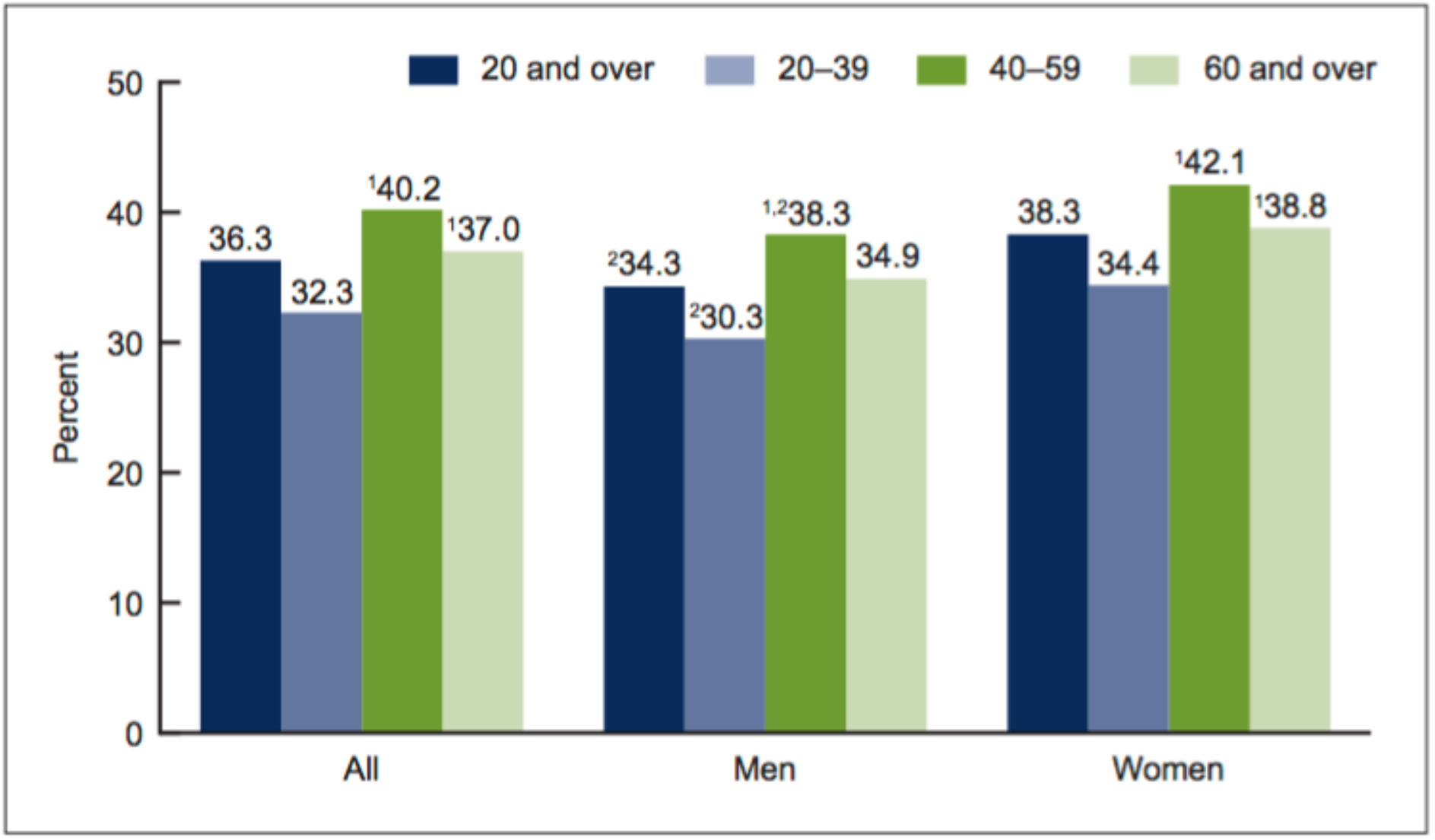
(*BMI ε30, or about 30 lbs. overweight for 5'4" person)



Obesity

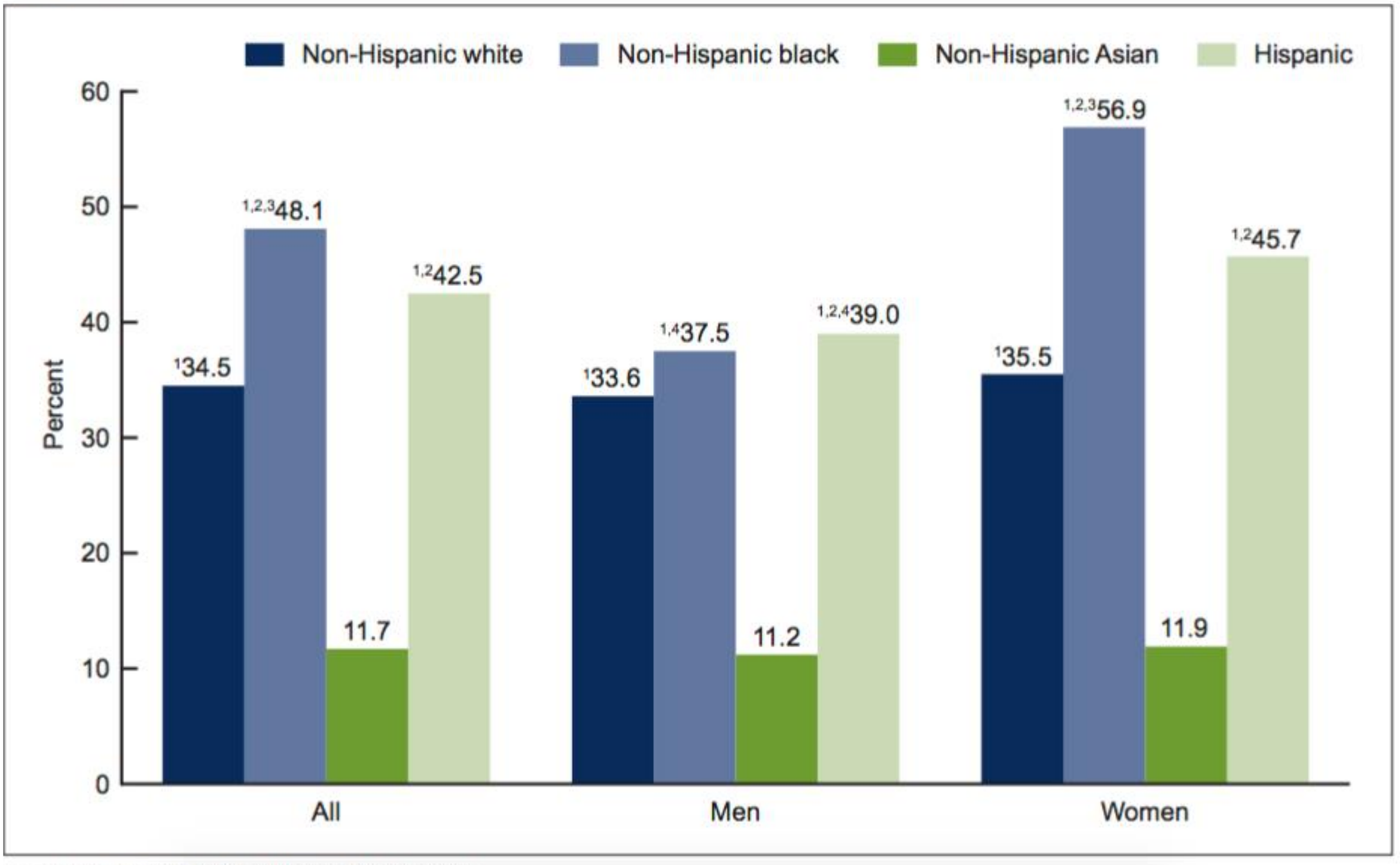
- For centuries due to food scarcity, obesity was associated with affluence, gluttony, health and prosperity.
- Today obesity affects the all socioeconomic classes
- Higher income women are less likely to have obesity than low-income women.

Figure 1. Prevalence of obesity among adults aged 20 and over, by sex and age: United States, 2011–2014



[1]Significantly different from those aged 20–39.
[2]Significantly different from women of the same age group.
NOTES: Totals were age-adjusted by the direct method to the 2000 U.S. census population using the age groups 20–39, 40–59, and 60 and over. Crude estimates are 36.5% for all, 34.5% for men, and 38.5% for women.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2011–2014.

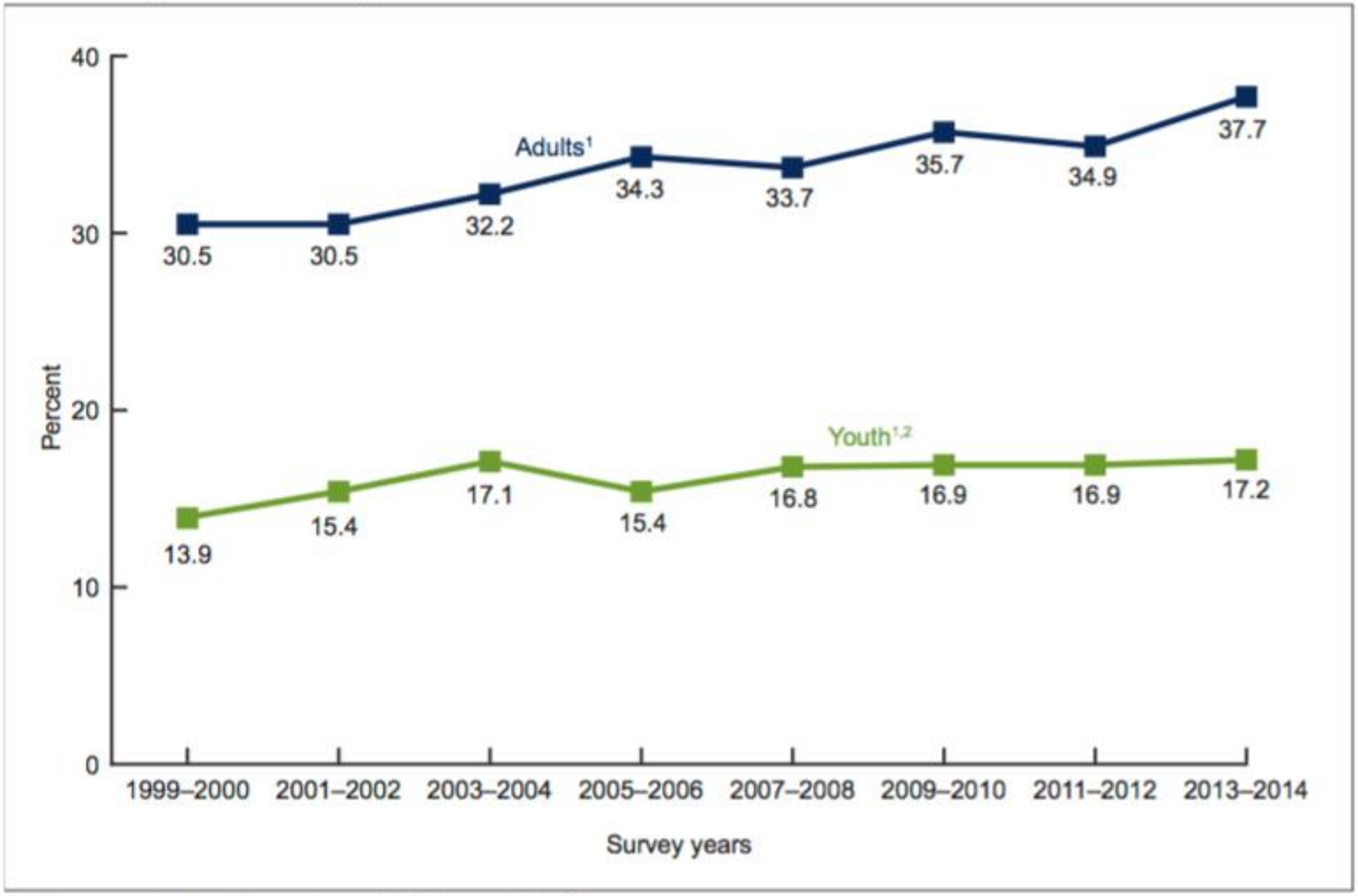
Figure 2. Prevalence of obesity among adults aged 20 and over, by sex and race and Hispanic origin: United States, 2011–2014



[1]Significantly different from non-Hispanic Asian persons.

Trends in Obesity

Figure 5. Trends in obesity prevalence among adults aged 20 and over (age-adjusted) and youth aged 2–19 years: United States, 1999–2000 through 2013–2014



[1]Significant increasing linear trend from 1999–2000 through 2013–2014.
[2]Test for linear trend for 2003–2004 through 2013–2014 not significant ($p > 0.05$).
NOTE: All adult estimates are age-adjusted by the direct method to the 2000 U.S. census population using the age groups 20–39, 40–59, and 60 and over.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.

Changes in perception

- In **2004**, Medicare removed language from its coverage manual saying obesity was not a disease.
- The Obesity Society (TOS) in **2008** moved to recognize obesity as a disease [(2)].
    - “Obesity is a complex condition with many causal contributors, including genetic ones and many environmental factors that are largely beyond individuals’ abilities to choose or control”

Recognized in 2013

- “Corpulency, when in an extraordinary degree, may be reckoned a disease, as it in some measure obstructs the free exercise of the animal functions; and hath a tendency to shorten life, by paving the way to dangerous distempers.” — Malcolm Flemyng, 1760 [3]

Obesity Impacts Nearly Every Organ System

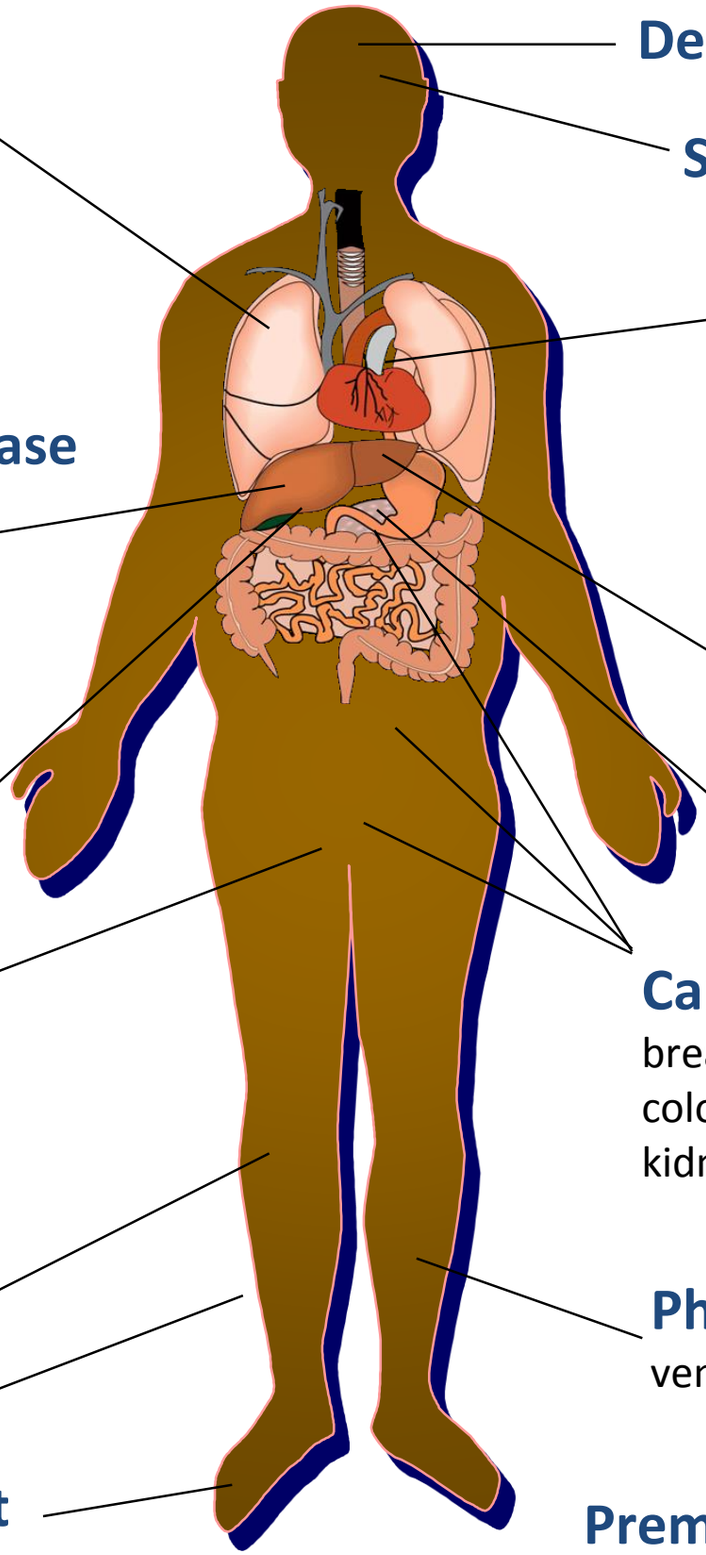
Pulmonary disease
abnormal PFTs
obstructive sleep apnea
hypoventilation syndrome

Depression

Stroke

Cardio/Metabolic Syndrome
diabetes
dyslipidemia
hypertension
metabolic syndrome

Nonalcoholic fatty liver disease
steatosis
steatohepatitis
cirrhosis



GERD

Severe pancreatitis

Gallbladder disease

Gynecologic abnormalities
abnormal menses
infertility
polycystic ovarian syndrome
stress incontinence

Cancer
breast, uterus, cervix
colon, esophagus, pancreas
kidney, prostate

Osteoarthritis

Skin

Gout

Phlebitis
venous stasis

Premature Death

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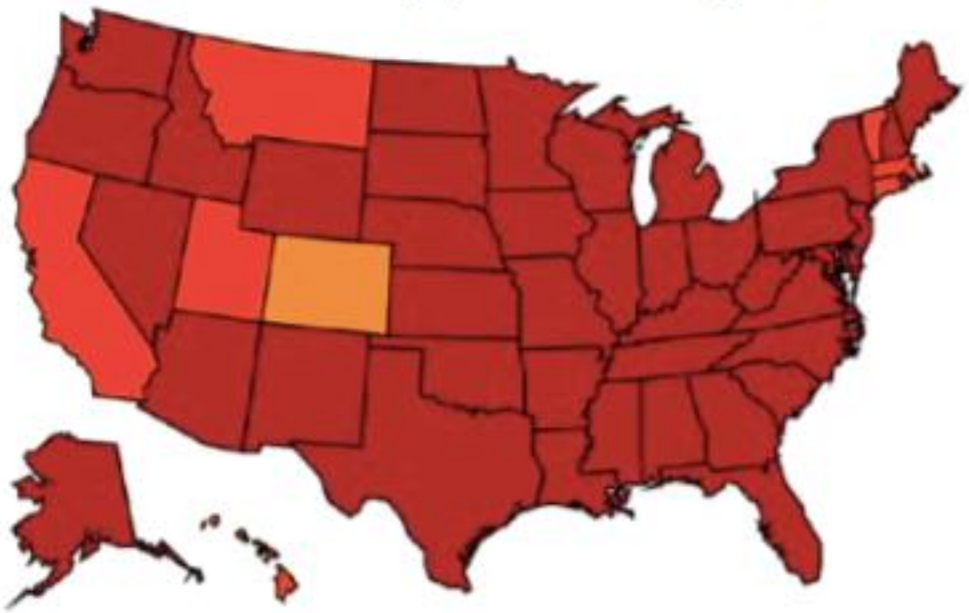
Obesity & Diabetes

- From 1999-2014 the prevalence of obesity and the prevalence of diagnosed diabetes rose in all states. In 1994, all but two states had prevalence of obesity less than 18% and no state exceeded 22%. In 2014, no state had less than 18% and all but two states exceeded 22%. Similarly for diagnosed diabetes, in 1994, almost all states had prevalence less than 6.0%. In 2014, all states exceeded 6.0%; 28 of these exceeded 9.0%.

Age–Adjusted Prevalence of Obesity and Diagnosed Diabetes Among US Adults

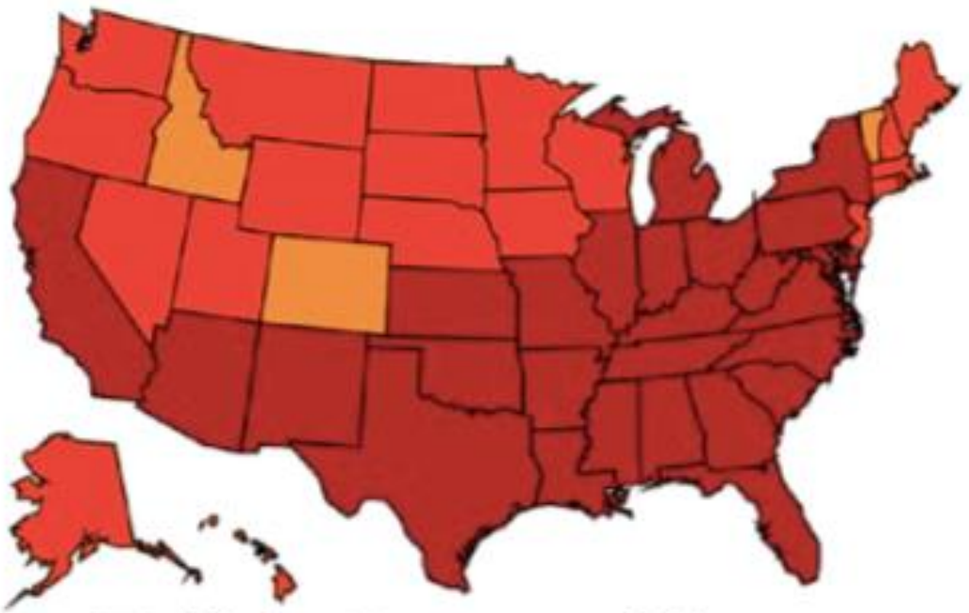
2014

Obesity (BMI≥30 kg/m²)



Missing Data
14.0%–17.9%
22.0%–25.9%
<14.0%
18.0%–21.9%
≥26.0%

Diabetes



Missing data
4.5%–5.9%
7.5%–8.9%
<4.5%
6.0%–7.4%
≥9.0%

CDC's Division of Diabetes Translation. United States Diabetes Surveillance System available at http://www.cdc.gov/diabetes/data

Bariatric or Metabolic Surgery

- In the 1990s, bariatric surgery was somewhat experimental and not universally adopted. By 2000, bariatric surgery gained significant steam and became standard surgical practice.

- The relationship between bariatric surgery and improvement in diabetes may be traced to a 1992 case report in the New England Journal of Medicine that described improvement in diabetes following a gastrojejunostomy.

Surgery for Metabolic Diseases

- Certain patients *might* benefit from surgical intervention
- *It's not for everyone*
- It's not a substitute for nutrition, exercise
- Is used in conjunction with long-term monitoring and counseling

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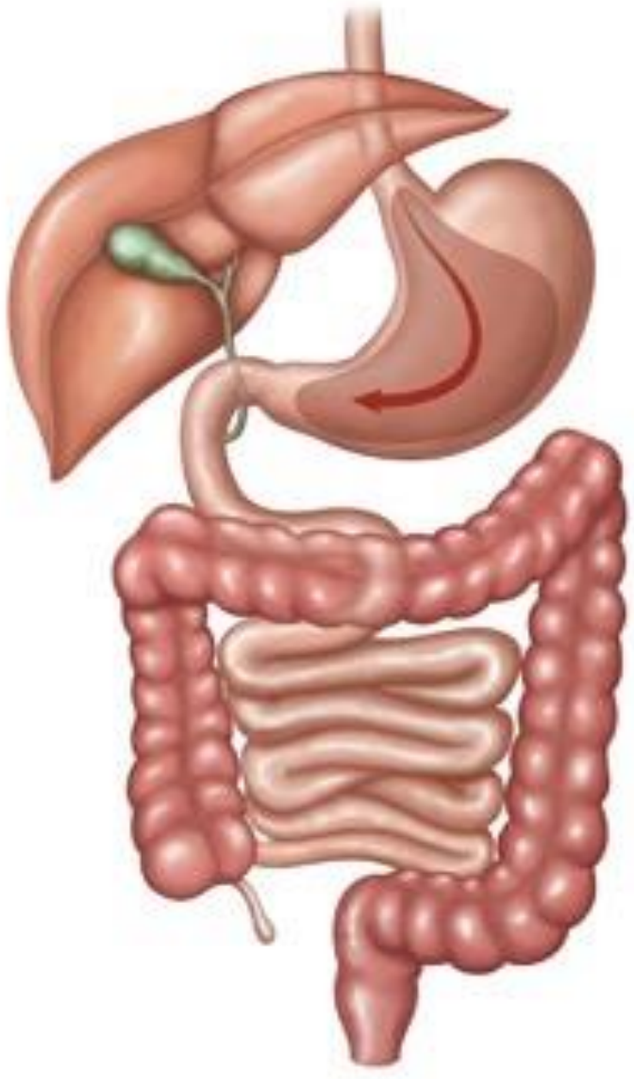
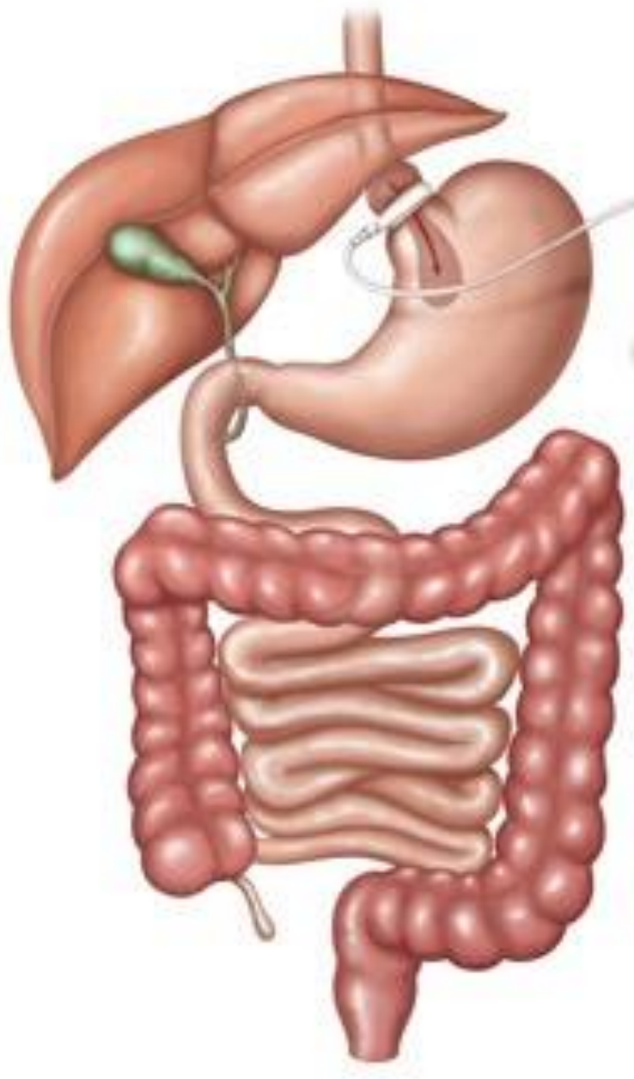
There are **NO** “One-size-fits-all” Solutions

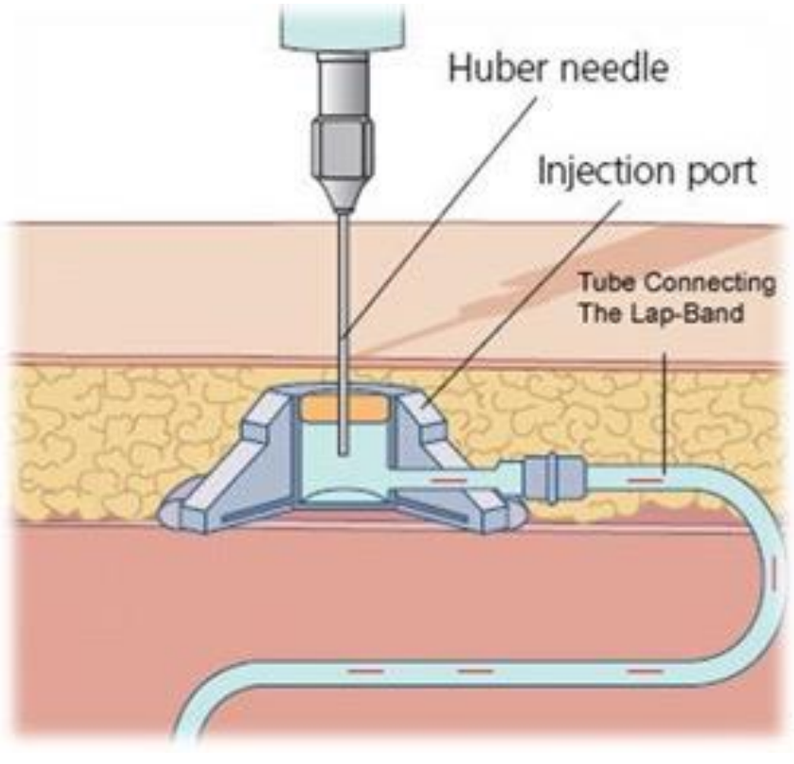
Lap Band



Digestive System
Before Surgery



Digestive System
After Surgery



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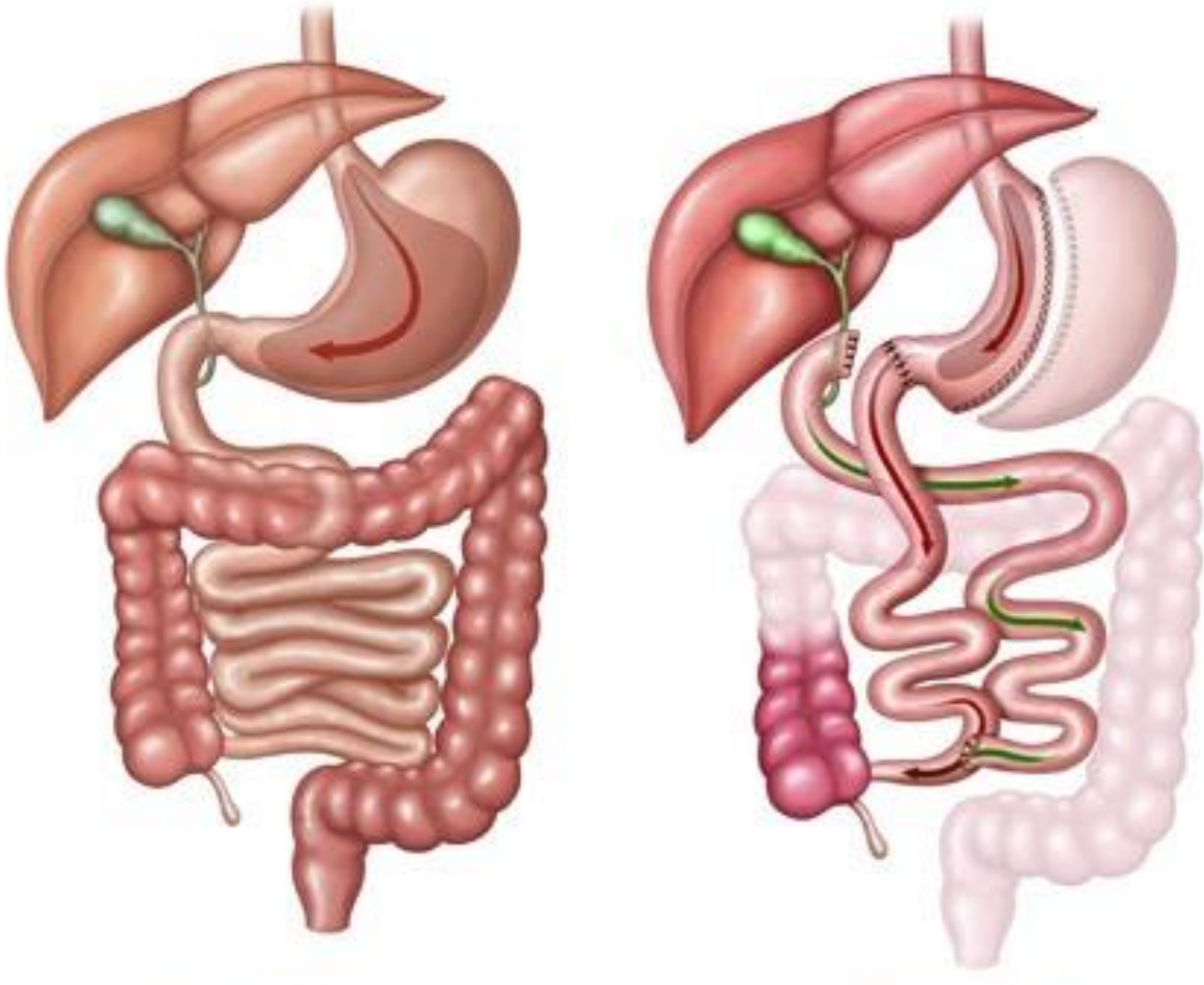
Duodenal Switch



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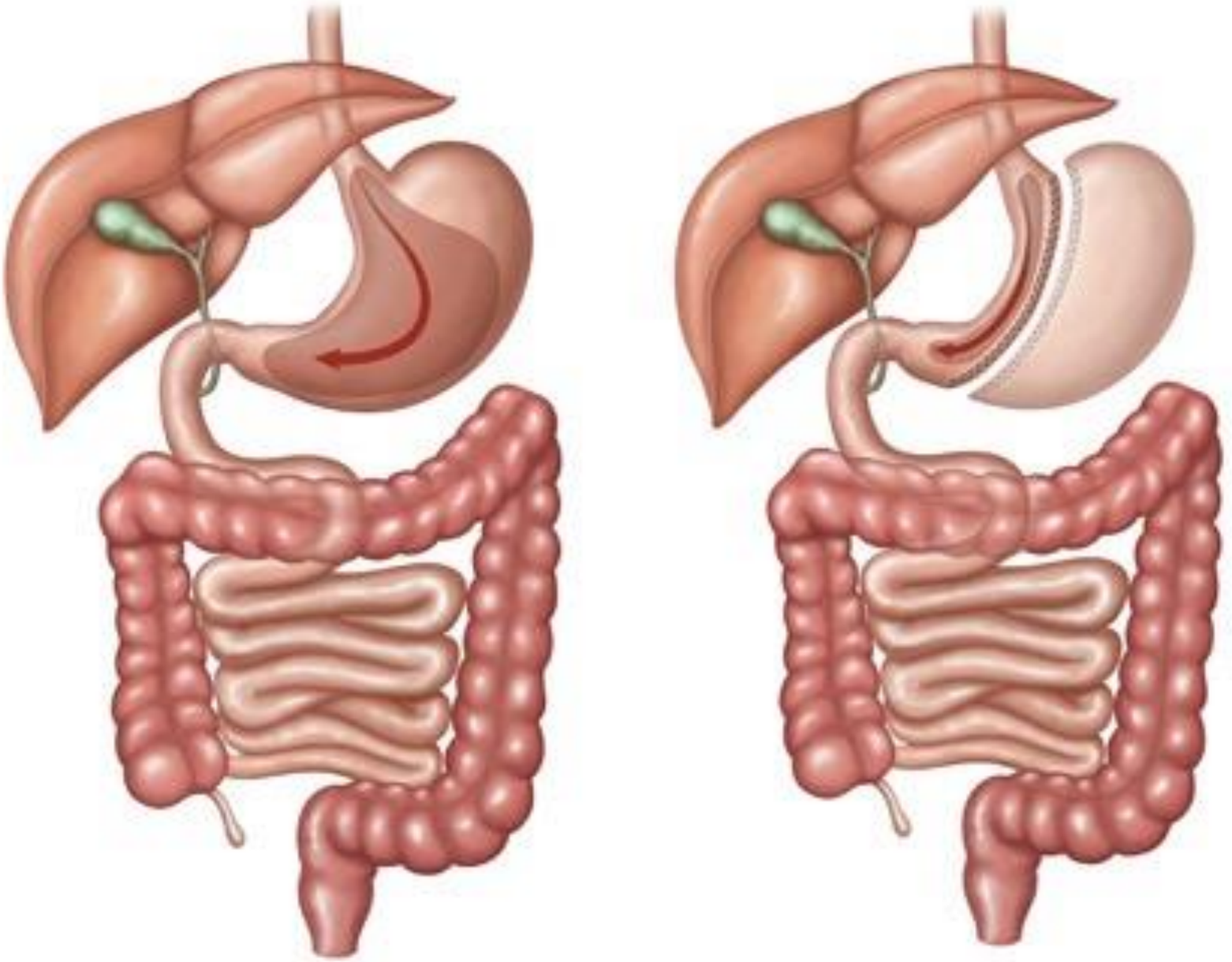
Sleeve Gastrectomy



Digestive System
Before Surgery

Digestive System
After Surgery

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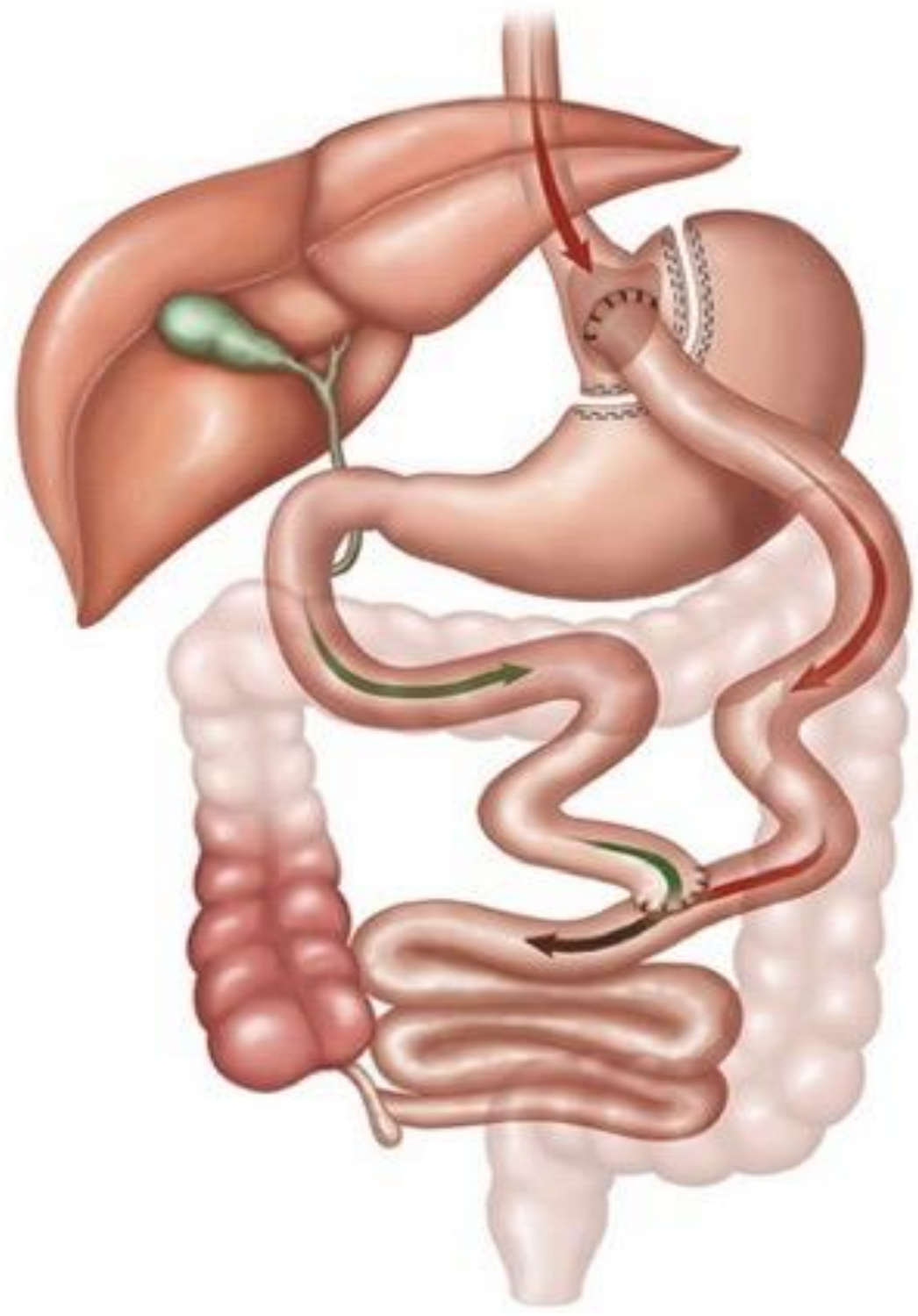
Gastric Bypass (Roux-en-Y)



Changes in metabolic hormones

- Serum Ghrelin,
- Leptin,
- Insulin, growth hormone,
- GLP-1, Peptid YY

Hormones continued

- Food avoiding contact with gastric oxyntic glands has been implicated in the reduced production of the appetite stimulating hormone Ghrelin

- Accelerated gastric emptying has been shown to increase secretion of GLP-1 and Peptid YY

- Changes in gastric pH and bile acids have also been implicated in weight loss[6]

- Good weight loss responders have a more anorectic postprandial hormonal profile consisting of an increased GLP-1 production and more pronounced ghrelin suppression in response to a meal challenge.

- Weight loss alone is not the mechanism by which these surgeries improve diabetes mellitus. Changes in b cell responsiveness, incretin levels (e.g., glucagon- like peptides), and bile salt regulation also play a role

Bariatric (Metabolic) Surgery

- **Surgical Therapy and Medications Potentially Eradicate Diabetes Efficiently, (STAMPEDE) 2010.**
  - evaluate the efficacy of two bariatric surgeries (laparascopic sleeve gastrectomy) and gastric bypass (Roux-en-Y) vs advanced medical therapy in patients with T2DM with modest obesity with BMI of **27–42** kg/m2.
- This single site, prospective, randomized controlled trial, enrolled 150 subjects.
- The primary end point; rate of biochemical resolution of T2DM at 1 year as measured by HbA1c < 6%. (Subsequent 3 yr and 5 yr data has been reported)
- The safety and adverse event rates were compared between the three arms of the study.

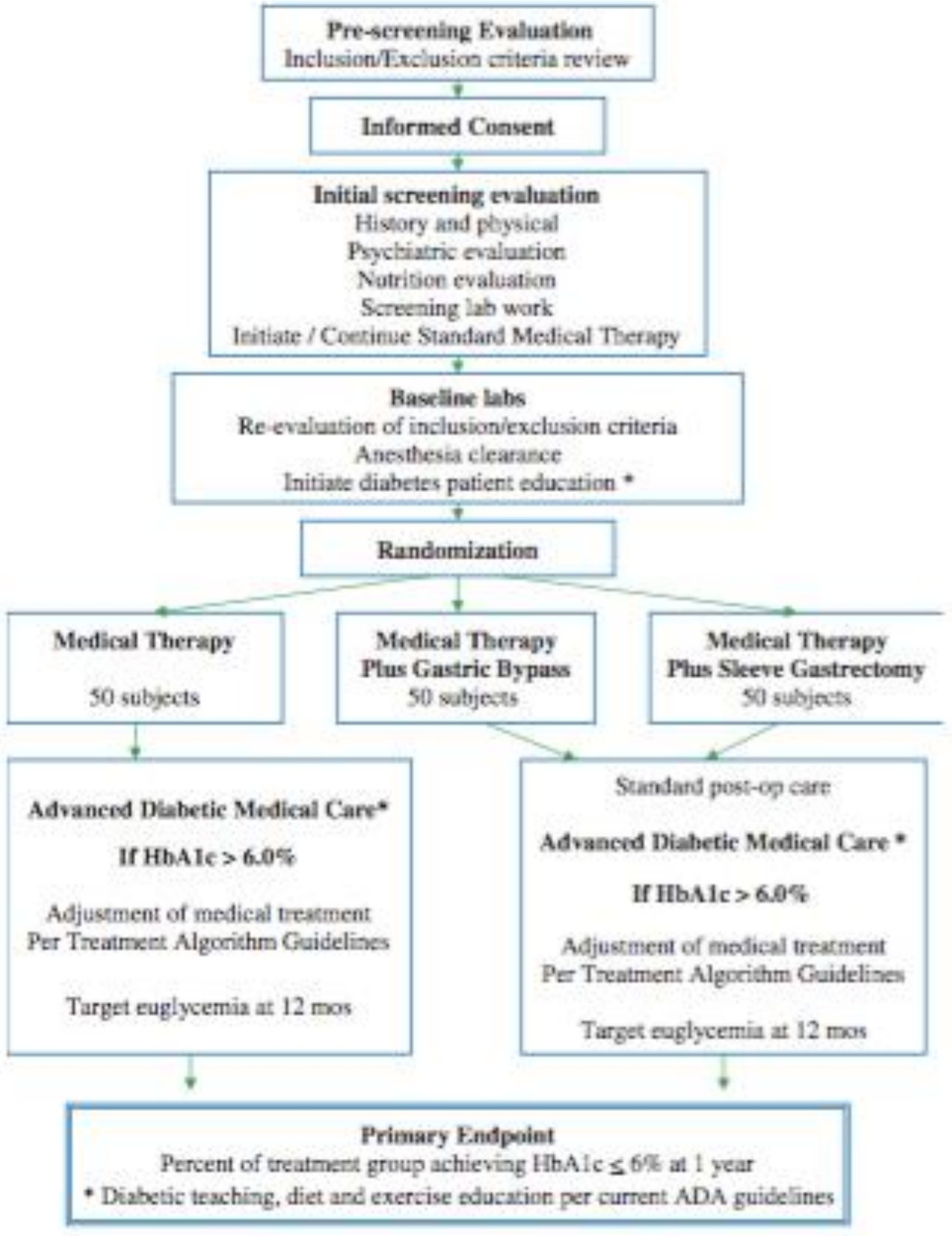


Figure 2. Overview of trial design and patient flow.

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3yr Results

- The long-term follow-up of this study, the STAMPEDE II trial, shows a lasting advantage of surgery over medical therapy for controlling diabetes

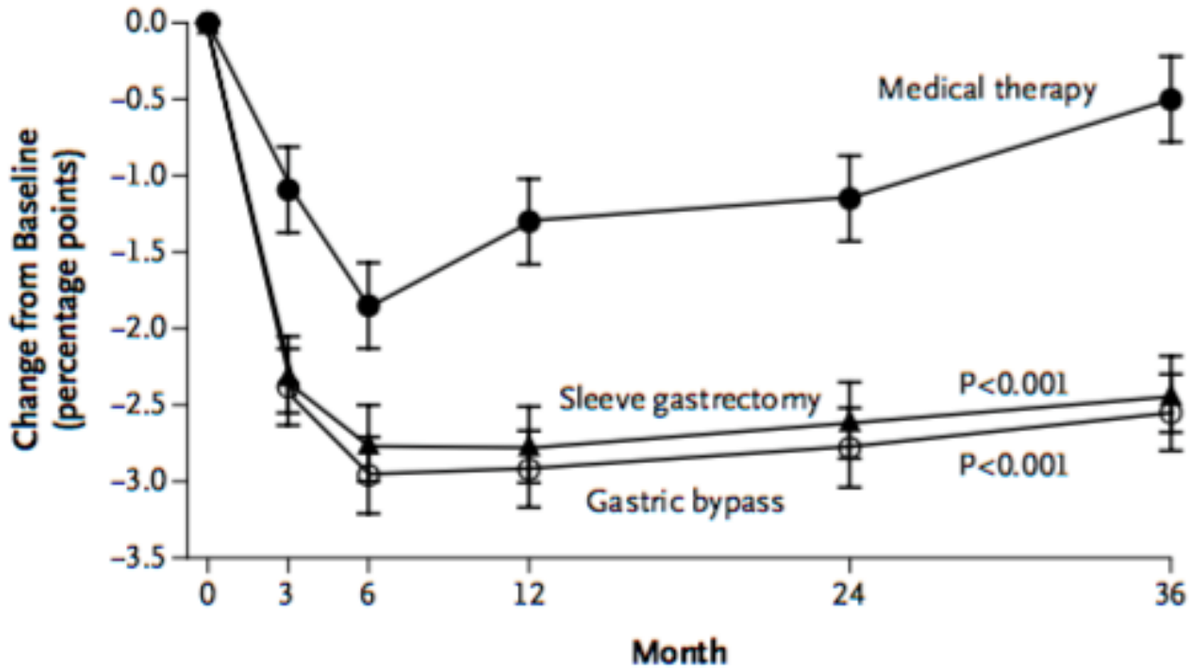
- Criterion for endpoint (% of treatment group with <6.0 % HgbA1c)

  - Medical therapy **5%**

  - Sleeve Gastrectomy **24%**

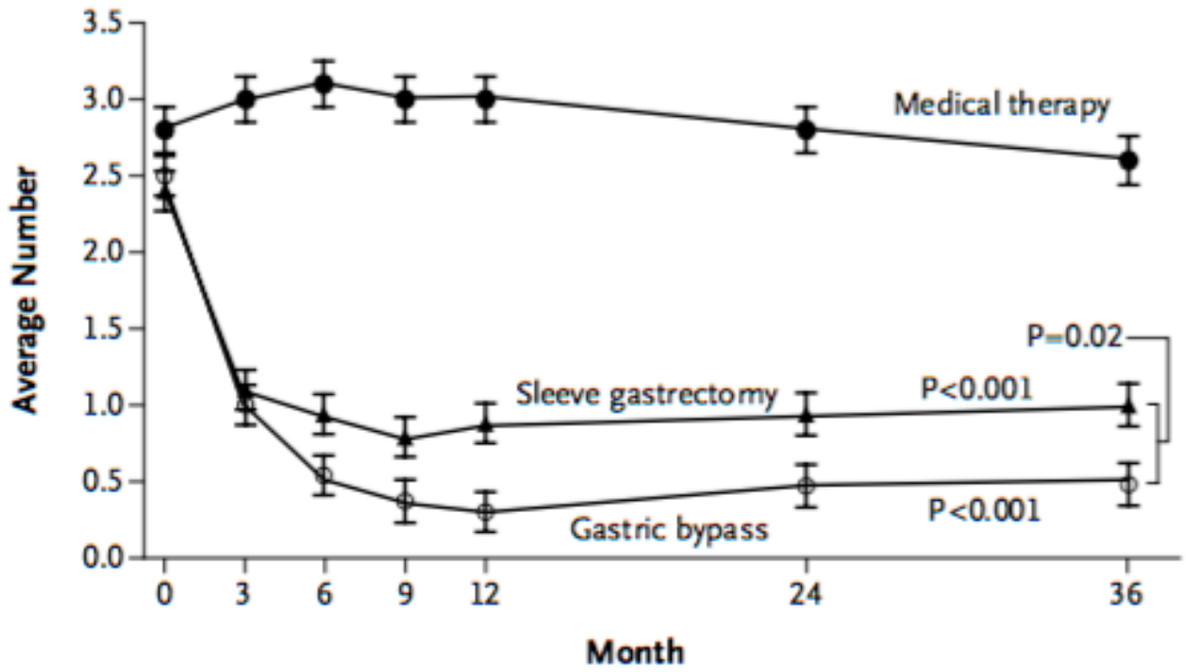
  - Roux-en-Y Gastric Bypass **38%**

A Glycated Hemoglobin



Value at Visit					
Medical therapy	9.0 (8.5)	7.1 (6.8)	7.5 (6.9)	7.7 (7.3)	8.4 (7.6)
Sleeve gastrectomy	9.5 (8.9)	6.7 (6.4)	6.6 (6.4)	6.8 (6.8)	7.0 (6.6)
Gastric bypass	9.3 (9.2)	6.3 (6.2)	6.3 (6.1)	6.5 (6.4)	6.7 (6.6)

C Diabetes Medications

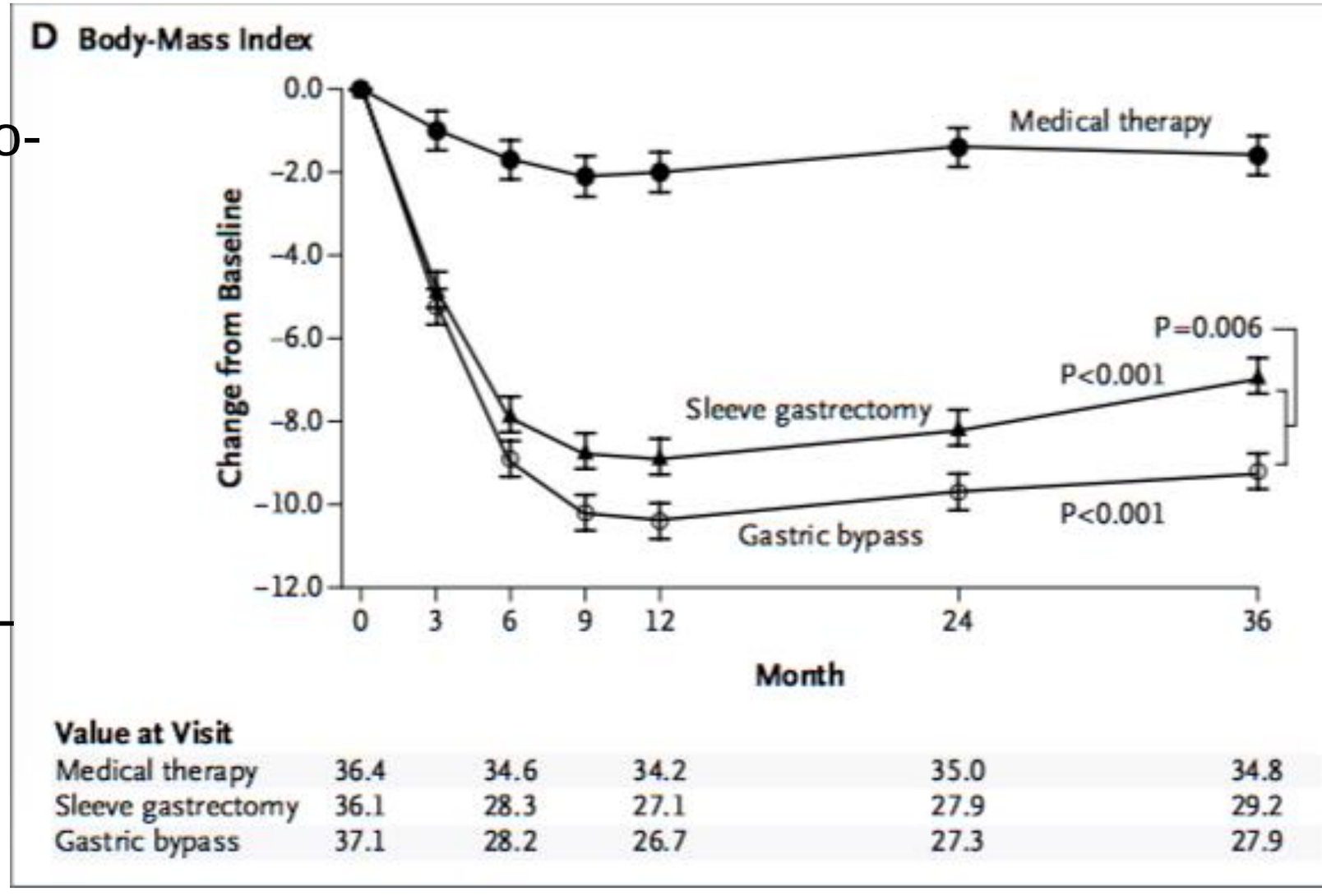


Value at Visit					
Medical therapy	2.8	3.1	3.0	2.8	2.6
Sleeve gastrectomy	2.4	0.94	0.88	0.94	1.0
Gastric bypass	2.5	0.54	0.3	0.47	0.48

Secondary Outcomes

- At 3 years, reductions in body weight, BMI, waist circumference, and waist-to-hip ratio were greater after gastric bypass and sleeve gastrectomy than after intensive medical therapy.

- Decreases in triglyceride levels and increase in high-density lipoprotein (HDL) cholesterol levels



Value at Visit					
Medical therapy	36.4	34.6	34.2	35.0	34.8
Sleeve gastrectomy	36.1	28.3	27.1	27.9	29.2
Gastric bypass	37.1	28.2	26.7	27.3	27.9

Discrepancies in DM remission

- Estimates of remission rates reported in the literature range from 25% to 81%

  - Some studies reported complete remission vs partial remission or both,

  - Some reported other definitions, such as HbA1c of 5.7% or lower with no antidiabetic medication, HbA1c of 6.0% or less and no antidiabetic medication other than metformin, and HbA1c <= 6.0% with or without antidiabetic medications.

Longevity

- Numerous RCTs with postoperative follow-up ranging between 1 and 5 years have consistently documented sustained diabetes remission in 30–63% of patients.

- Data suggest an erosion of diabetes remission over time: 35–50% or more of patients who initially achieve remission of diabetes eventually experience recurrence.

- However, the median disease-free period among such individuals with Roux-en-Y gastric bypass (RYGB) is ***8.3 years***

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Benefits for BMI <35 kg/m^2

The current eligibility criteria for bariatric surgery originated from the National Institutes of Health consensus panel in 1991, which considers patients with T2D and a body mass index (BMI)≥35 kg/m$_2$ eligible for bariatric surgery

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Update our view

- Most patients with T2D fall into a BMI category<35 kg/m^2
  - Data were retrieved from the American College of Surgeons–National Surgical Quality Improvement Program (ACS-NSQIP) data sets (2005–2014).
  - included patients ≥18 years old with BMI≥25 but<35 kg/m_2, who were receiving active medical treatment for T2D and underwent primary bariatric surgery.
    - LSG, RYGB, LAGB, DS

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Aminian et al.

- Mean BMI of the 1300 patients who met the inclusion criteria was 33.5±1.6 kg/m^2.
  - Fifty-five patients had a BMI<30 kg/m^2.
    - 40% were on insulin with the remaining on oral hypoglycemic medications.
- Concluded that bariatric surgery, which is a 2-hour procedure requiring a 2-day hospital stay, is a relatively well-tolerated option in patients with T2D and mild obesity. RYGB and SG had comparable early postoperative morbidity.

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June 2016

- The 2nd Diabetes Surgery Summit (DSS-II), released their recommendations from an international consensus conference.

- Collaboration with leading diabetes organizations to develop global guidelines to inform clinicians and policymakers about benefits and limitations of metabolic surgery for T2D

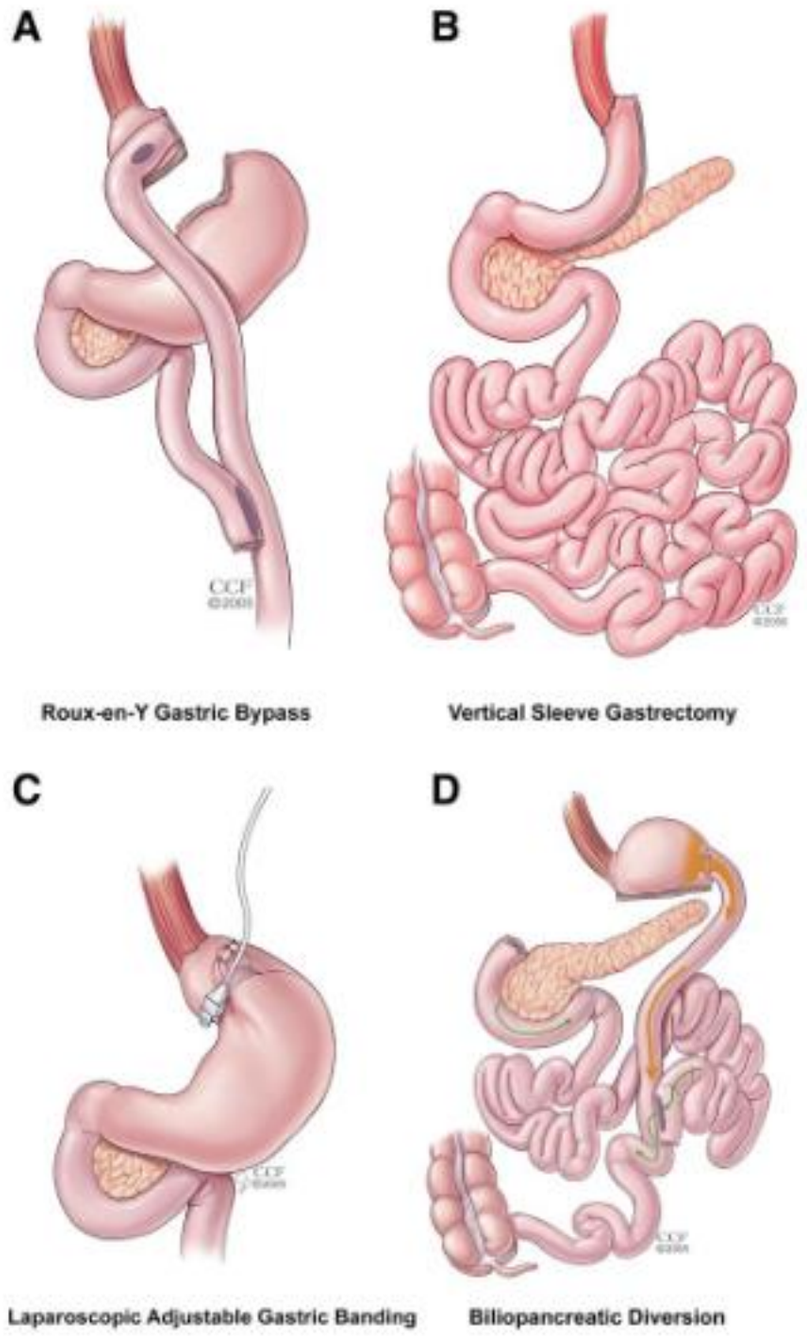
- A multidisciplinary group of 48 international clinicians/scholars (75% nonsurgeons)

DDS-II

- 6 leading international diabetes organizations:
  - American Diabetes Association,
  - International Diabetes Federation,
  - Chinese Diabetes Society,
  - Diabetes India,
  - European Association for the Study of Diabetes, and
  - Diabetes UK.

New Recommendations

1. Metabolic surgery ***should be a recommended*** option to treat T2D in appropriate surgical candidates with class III obesity (BMI ≥40 kg/m_2), regardless of the level of glycemic control or complexity of glucose-lowering regimens, as well as in patients with class II obesity (BMI 35.0–39.9 kg/m_2) with inadequately controlled hyperglycemia despite lifestyle and optimal medical therapy.



New Recommendations

2. Metabolic surgery ***should also be considered*** to be an option to treat T2D in patients with class I obesity (BMI 30.0–34.9 kg/m$_2$) and inadequately controlled hyperglycemia despite optimal medical treatment by either oral or injectable medications (including insulin).

3. All BMI thresholds should be reconsidered depending on the ancestry of the patient.

   - For example, for patients of Asian descent, the BMI values above should be reduced by 2.5 kg/m$_2$.

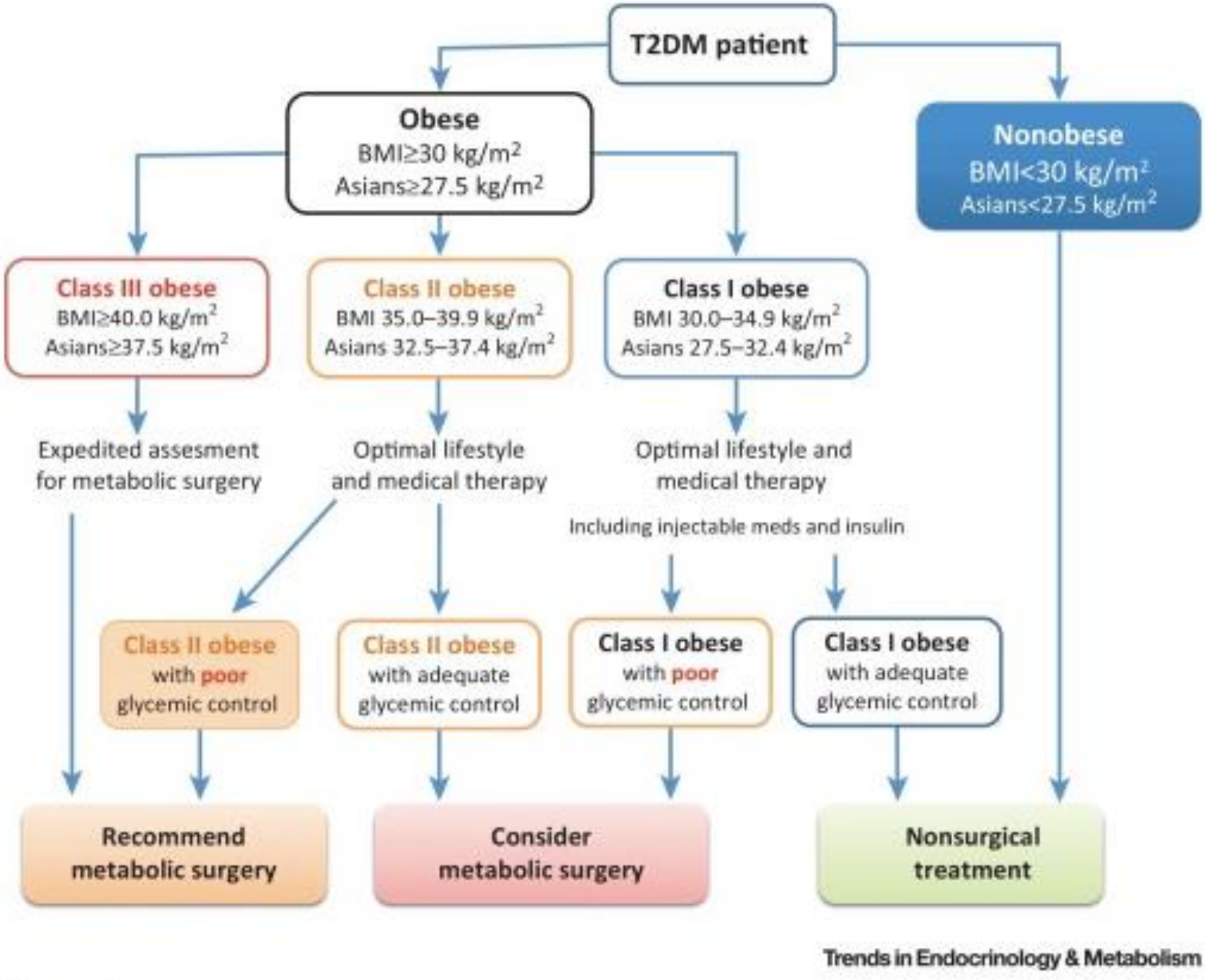


Figure 1.

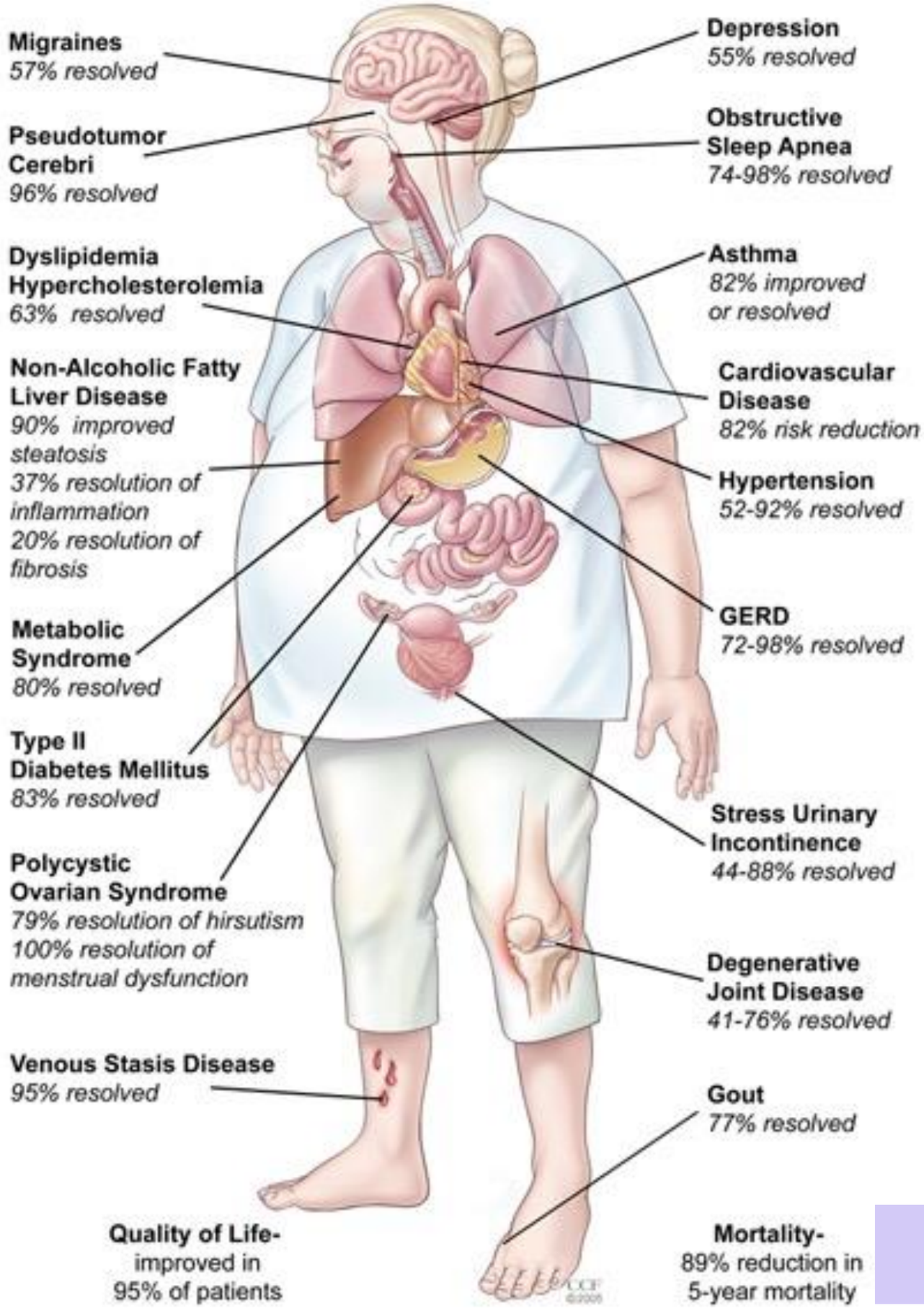
Type 2 Diabetes Mellitus (T2DM) Algorithm Derived from the Second Diabetes Surgery Summit. The figure shows the key recommendations that have emerged from the Summit for the treatment of T2DM by surgical interventions. See main text for details. Abbreviation: BMI, body mass index.

Summary

- Bariatric surgery is known to be the most effective and long lasting treatment for morbid obesity and many related conditions, but now mounting evidence suggests it may be among the most effective treatments for metabolic diseases and conditions
  - type 2 diabetes, hypertension, high cholesterol, non-alcoholic fatty liver disease and obstructive sleep apnea.

Bariatric Surgery and Diabetes

- What should we be offering our obese patients with diabetes?
- Should bariatric surgery be offered sooner?
  - and to lower BMIs?


Migraines
57% resolved
Pseudotumor Cerebri
96% resolved
Dyslipidemia Hypercholesterolemia
63% resolved
Non-Alcoholic Fatty Liver Disease
90% improved steatosis
37% resolution of inflammation
20% resolution of fibrosis
Metabolic Syndrome
80% resolved
Type II Diabetes Mellitus
83% resolved
Polycystic Ovarian Syndrome
79% resolution of hirsutism
100% resolution of menstrual dysfunction
Venous Stasis Disease
95% resolved
Quality of Life-
improved in
95% of patients
Depression
55% resolved
Obstructive Sleep Apnea
74-98% resolved
Asthma
82% improved or resolved
Cardiovascular Disease
82% risk reduction
Hypertension
52-92% resolved
GERD
72-98% resolved
Stress Urinary Incontinence
44-88% resolved
Degenerative Joint Disease
41-76% resolved
Gout
77% resolved
Mortality-
89% reduction in
5-year mortality

Future??

- As more research surfaces purporting the beneficial effect of bariatric surgery not only on ***diabetes*** but also on ***cancer reduction, cardiovascular-related mortality, and nonalcoholic steatohepatitis,*** it is anticipated that bariatric surgeries will become more prevalent and performed earlier.

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Thank you!

References

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