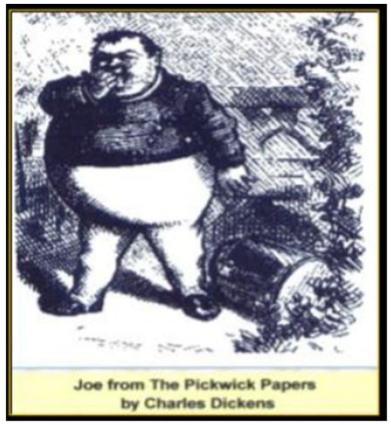
Medical Management of Obesity


Joe from The Pickwick Papers
by Charles Dickens

Brian C Weiner, MD, MS, FACP, AGAF

Medical Director, Appeals and Grievances

Gastroenterology

United Healthcare | Optum Health Education™

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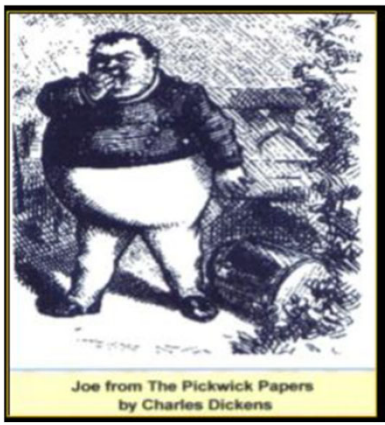
July 10, 2025


Joe from The Pickwick Papers
by Charles Dickens

United Healthcare

Medical Management of Fat, Gluttony, Sloth

Brian C Weiner, MD, MS, FACP, AGAF
Medical Director, Appeals and Grievances
Gastroenterology

March 12, 2025

Disclaimer

The contents of this lecture are created by Dr. Weiner personally and do not reflect any position of United HealthCare or affiliates.

Intellectual property

-Multi-method and Multi-apparatus for Treating Obesity. U.S. Patent #8,926,648, issue date January 6, 2015.
-The Ice Diet and methods of implementing same, U.S. patent #8,775,203, issue date July 8, 2014.
-The Weiner Gastric Balloon, an Inflatable Gastric Device for Treating Obesity. U.S. patent # 4,694,827. Issue date September 22, 1987.
-Medical director, Souvion LLC, publisher of the Ice Diet

Objectives

- Recognize the contribution of obesity to substantial co-morbidity in children and adults.
- Identify the role of evidence-based approaches for the management of obesity and examine the critical role of dietary interventions.
- Discuss the use the different classes of medications available for the management of obesity.

Medical Approaches to Weight Loss Treatment

- Hypocaloric diets
- Behavior modification
- Social support
- Exercise
- Pharmacotherapy
- Gastroenterology Approach - Scope!
- Surgery

Physiol Rev 2013 Jan; 93(1):359

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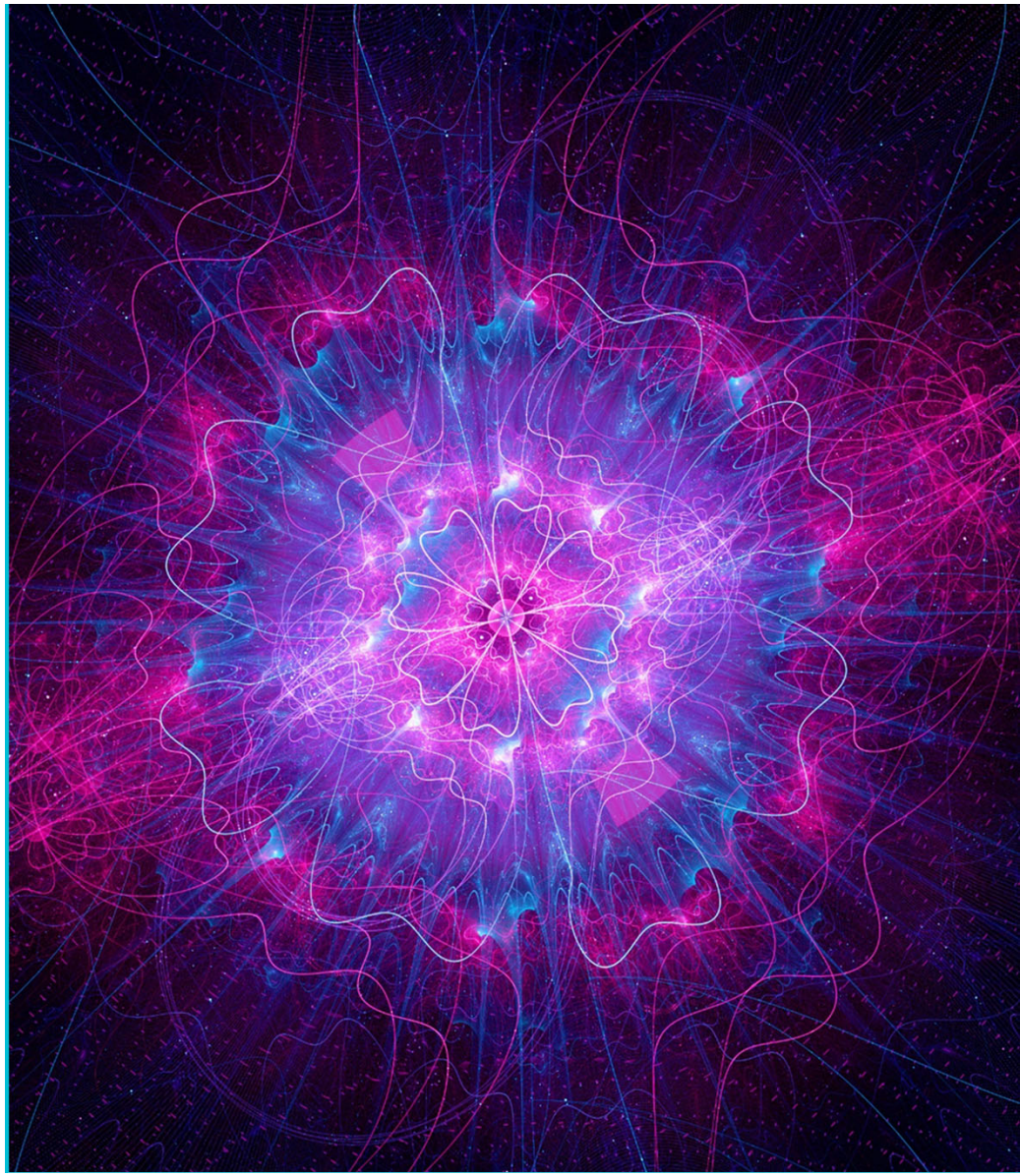
Physiol Rev 2013 Jan; 93(1):359

Higg’s Boson

- one of 17 known subatomic particles
- predicted by Peter Higgs in 1960
- discovered in 2012 at CERN LHC
- thought to confer mass onto other particles



Artist’s conception of the Higgs Boson

World Health Organization

BMI Classification

2016

$BMI = \frac{\text{weight kg}}{\text{height m}^2}$

Classification	BMI (kg/m²) Principal cutoff points	Additional cutoff points
Severe thinness	<16.00	
Moderate thinness	16.00-16.99	
Mild thinness	17.00-18.49	
Underweight	<18.50	
Normal range	18.50-24.99	18.50-22.99 23.00-24.99
Overweight/preobese	≥25.00	25.00-27.49 27.50-29.99
Obese	≥30.00	
Obese class 1	30.00-34.99	30.00-32.49 32.50-34.99
Obese class 2	35.00-39.99	35.00-37.49 37.50-39.00
Obese class 3	≥40.00	

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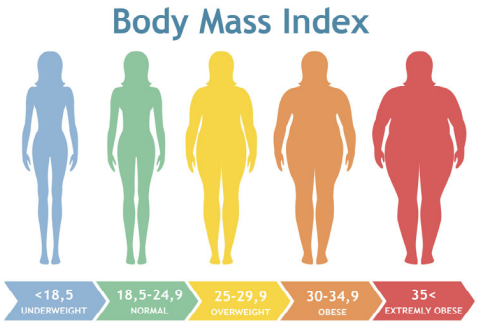
BMI=weight kg / height m^2



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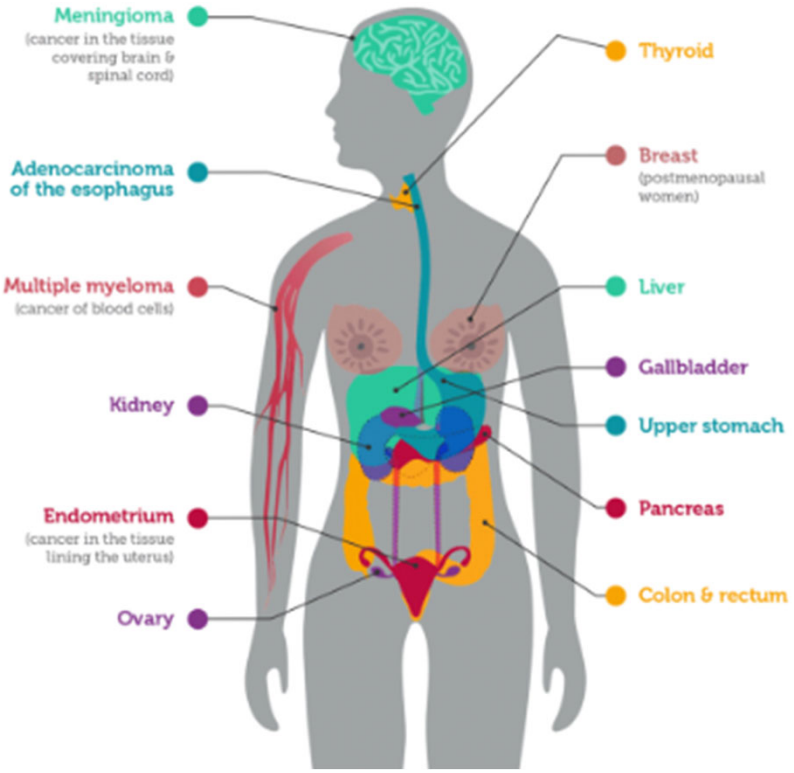
Obesity Associated Morbidities

- Atherosclerosis/Coronary artery disease
- Blunted growth hormone response
- Body habitus problems
- Chronic renal failure/kidney stones
- Cushing syndrome
- Degenerative joint disease
- Dementia
- Diabetes/ fatty liver disease
- Gallstones/pancreatitis
- GERD
- Hyperlipoproteinemia
- Hypertension
- Hypoventilation/COPD/Sleep apnea
- Infertility
- Skin disorders
- Social stigma/psychiatry disorders
- Thromboembolism
- Urine incontinence

Obesity Associated Cancers

- Biliary tract
- Breast
- Colon and rectum
- Endometrial
- Esophagus adenocarcinoma
- Kidney
- Liver, especially in fatty liver disease
- Meningioma
- Ovary
- Pancreas
- Prostate
- Thyroid



Obesity Risk Factors

- positive energy balance
- obesogenic environment
  - abundance of food
  - energy-dense
  - highly palatable foods
  - large portions
- decreasing physical activities
- increasing sedentary activities
- medications
- inadequate sleep
- genetic predisposition/ethnicity
- psychological factors, life events
- life stage, as pregnancy, menopause
- increased age
- male sex
- family history
- fructose consumption

Physio Rev 2013 Jan; 93(1):359

Medications associated with obesity

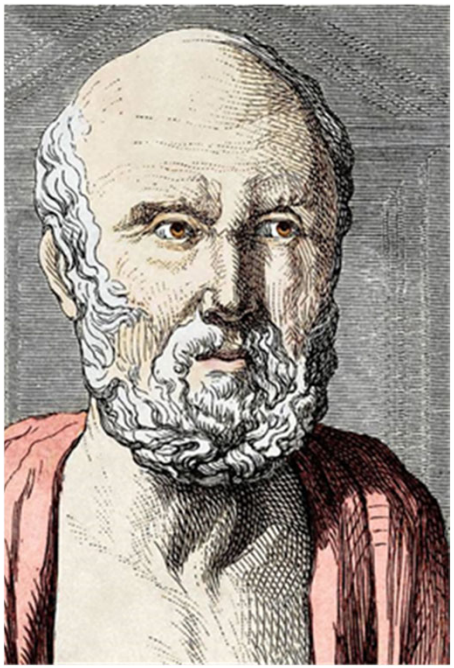
- Anti convulsants
- Anti depressants
- Anti histamines
- Anti hypertensives
- Anti psychotics
- Anti retroviral
- Benzodiazepines
- Chemotherapy
- Diabetes medications
- Hypnotics
- Lithium
- Opioids
- Steroids

Obesitymedicine.org/blog/medications-that-cause-weight-gain/

What is the role of the physician?

Hippocrates and Pythagoras

Both recommended hypocaloric diet and exercise



"Proper exercise, food and drugs maintain or restore the body's economy, which is health." Hippocrates

"No man, who values his health, ought to trespass on the bounds of moderation, either in labour, diet or concubinage." Pythagoras

Corpus hippocraticum. D Guthrie. A history of medicine. [London: Thomas nelson and sons, 1945, pg 52; Mackenzie, the history of health. Pg 72

Published diets used for weight loss

1. Mediterranean diet [fruits, vegetables, breads, cereals, beans, nuts, seeds, olive oil, limited red meat and sweets]
2. Low carbohydrate/ High fat [Atkins, Zone, South Beach]

3. Low fat
4. High protein
5. Low glycemic index
6. moderate CHO/AA/fat
7. DASH Dietary Approach to Stop Hypertension
8. Vegetarian
8. Volumetric/portion control
9. Meal replacement
10. Very low-calorie diet [<800 cal/d]
11. Paleolithic [unprocessed meat, fish, eggs, fruits, vegetables, and nuts, excludes industrial products such as dairy, margarine, oils, refined sugar, legumes, and cereal grain products]
12. Intermittent fasting
13. Commercial weight loss diets
14. Specific food types

Technical problems with diet studies

- small patient sample sizes
- underrepresentation of men
- limited generalizability
- lack of blinding
- lack of data on adherence to assigned diets
- large loss to follow-up
- novelty of the diet
- media attention
- enthusiasm of the researchers

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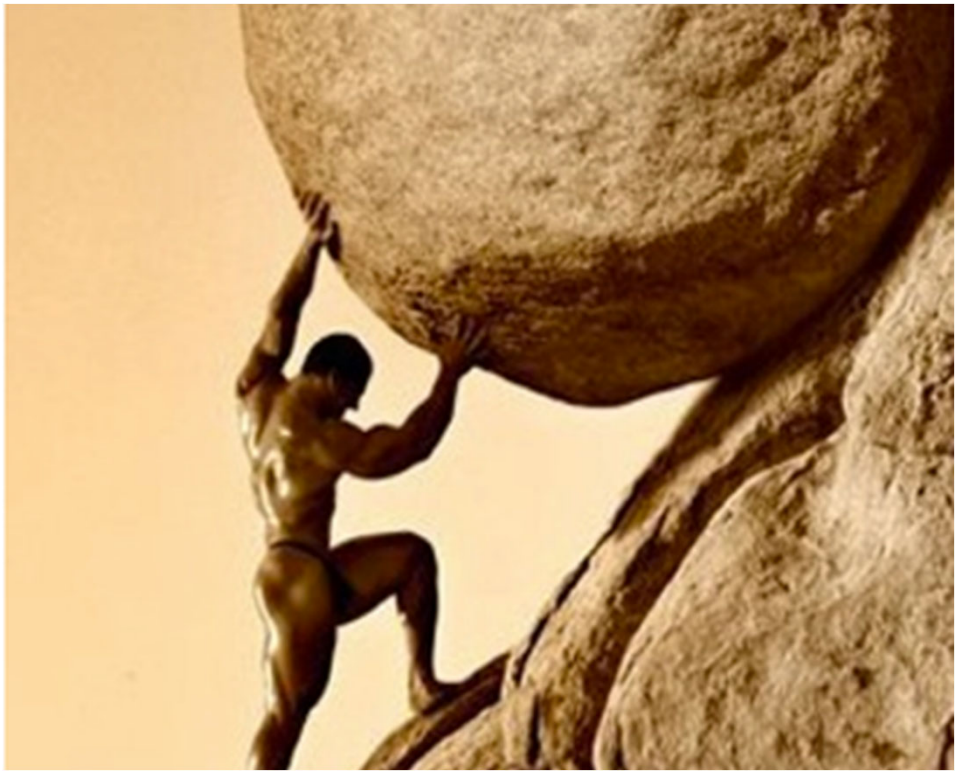
Efficacy of dieting

- 33 studies of dieting
- Up to 15% weight loss by 15 months
- High drop out rates (nearly 50%)
- Weight reduction of 4% by 30 months
- Weight reduction of 3.5% by 48 months



GMS Health Technol Assess. 2013 Jun 10;9:Doc06. doi: 10.3205/hta000112

AACE/ACE 2016 recommendations

structured lifestyle intervention program

healthy meal plan

physical activity

behavioral interventions (AACE/ACE grade A, Best evidence level 1)

reduce total caloric intake (AACE/ACE grade A, Best evidence level 1)

suggested general diet strategies include 500-750 calorie daily deficit

diet individualized to patient culture and preferences

consider macronutrient composition to optimize adherence, eating patterns, weight loss, metabolic profiles, risk factor reduction, and/or clinical outcomes (AACE/ACE grade A, Best evidence level 1)

American Association of Clinical Endocrinologists/American College of Endocrinology

https://pro.aace.com/clinical-guidance/2016-clinical-practice-guideline-and-algorithm-medical-care-patients-obesity

AACE/ACE 2016 recommendations

- No diet consistently affects weight loss compared to others with similar caloric intake
  - Mediterranean diet
  - low-carbohydrate diet
  - low-fat diet
  - high-protein diet
  - low glycemic index/load diet
  - moderate-carbohydrate/moderate-protein diet
  - DASH (Dietary Approaches to Stop Hypertension) diet
  - vegetarian diet
  - volumetric diet
  - meal replacement Obes Rev 2019 Apr;20(4):569-587.
  - very low calorie diet

American Association of Clinical Endocrinologists/American College of Endocrinology

https://pro.aace.com/clinical-guidance/2016-clinical-practice-guideline-and-algorithm-medical-care-patients-obesity

Academy of Nutrition and Dietetics 2021-2022

- Dietician has a role
- Medical nutrition therapy
- Adopt goals and interventions
- Coordinate care
- At least 5 contacts
- At least 1 year
- At least every 3 months

- Group or individual
- Assess dietary patterns
- Nutritionally adequate diet
- Behavioral strategies
- Physical activity
- realistic rate of weight loss 1-2 lbs/week
- initial weight loss goal of up to 10% of body weight and at least 3%-5% of body weight if cardiovascular risk factors present

www,andeal.org/topic.cfm?menu=5276&cat=6109

Intermittent fasting?

Intermittent fasting?

- Herodotus, Greek historian, 5th century BCE:

"The Egyptians vomit and purge themselves thrice every month, with a view to preserve their health, which in their opinion is chiefly insured by their aliment…"

- Diordorus Siculus, Greek historian, 1st century BCE:

"Prevent distempers by glisters*, purging, vomiting, or fasting every second, third or fourth day…"

- Dr. Andrew Borde, Oxford, England 1490:

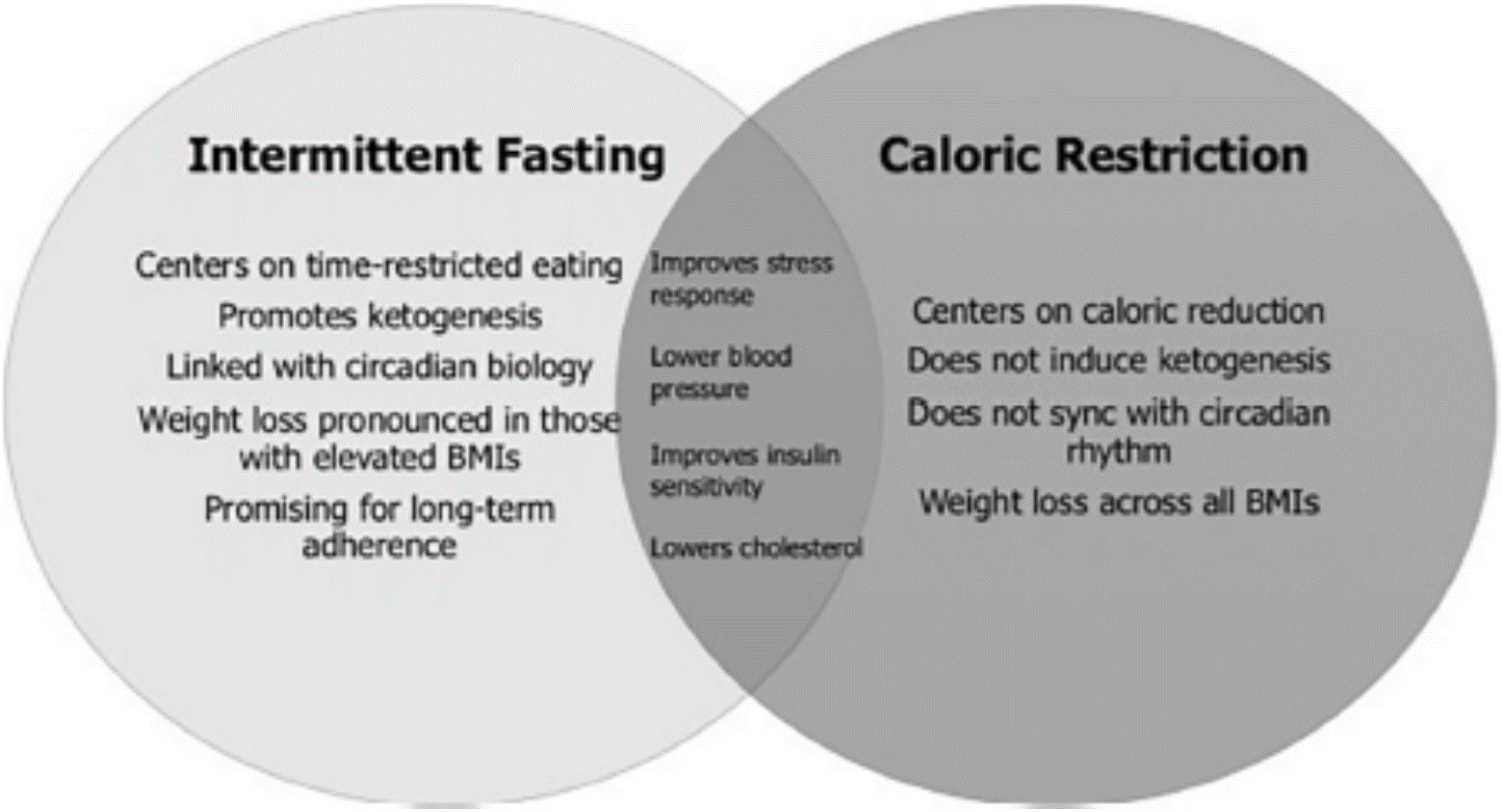
"Abstinence is the best remedy for overeating."

*Glister = Clyster or enema

Intermittent fasting?

- Low carbohydrate, high fat diets are ketogenic [Atkins, Zone, South Beach, Caveman/Paleo]
- Intermittent fasting [16:8 hours, 2:5 days] intensifies the ketosis
- Decreases appetite
- Improves mood
- Better glucose regulation
- Decreases insulin resistance
- Weight loss
- Improves lipid profiles
- Extends life?

Intermittent fasting?



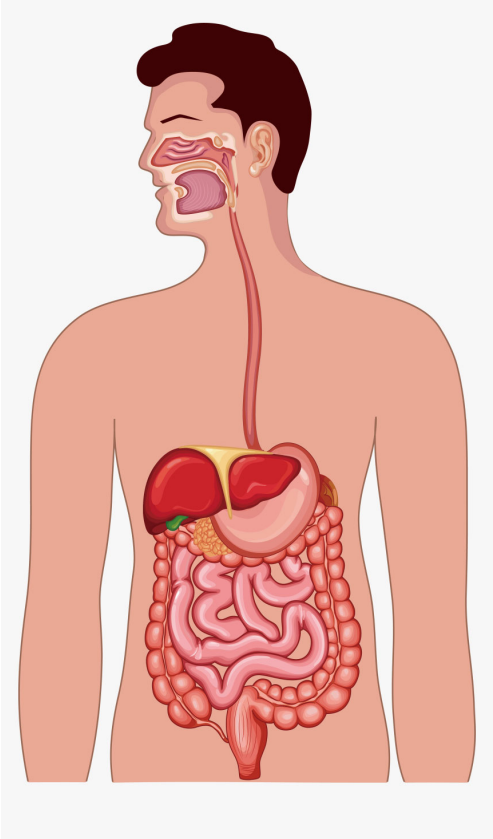
Am J Med. 2020 Aug;133(8):901-907

N Engl J Med 2019; 381:2541-2551

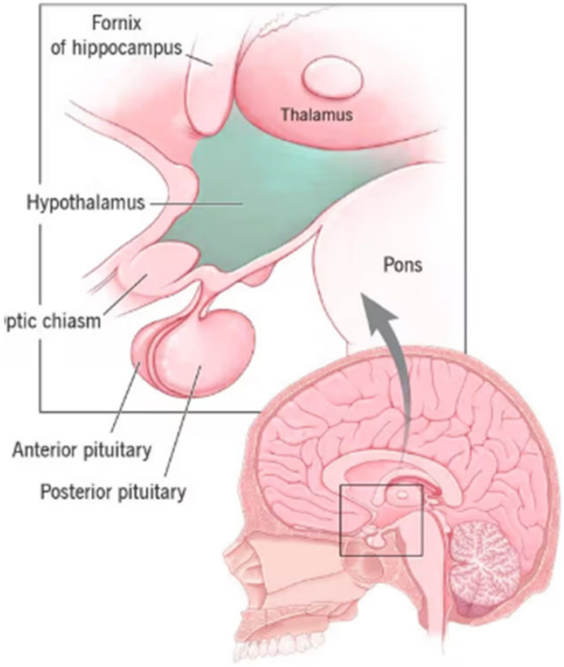
Diet and Exercise (Alone) Do Not Work!

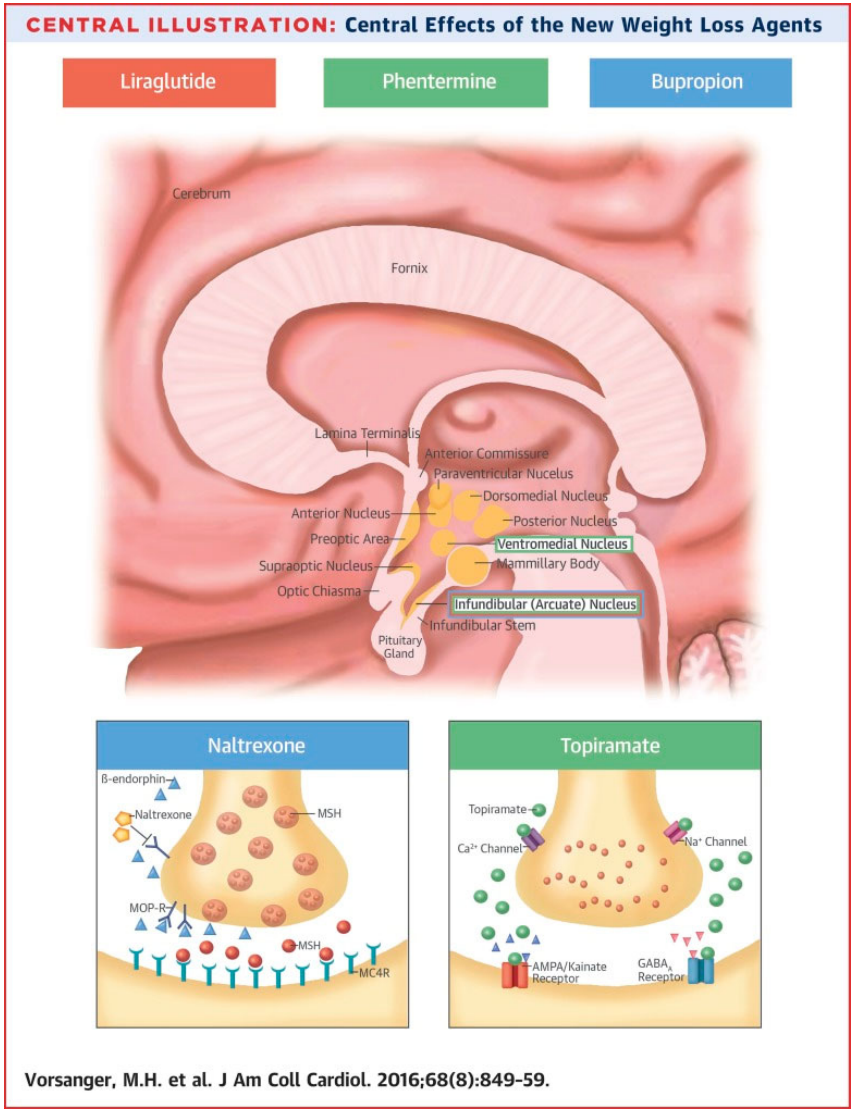
Open AI/DALL-E2 impression of a surprised Hippocrates

Regarding Obesity, what is the most important digestive organ?



Arcute and Ventromedial Nuclei in the hypothalamus

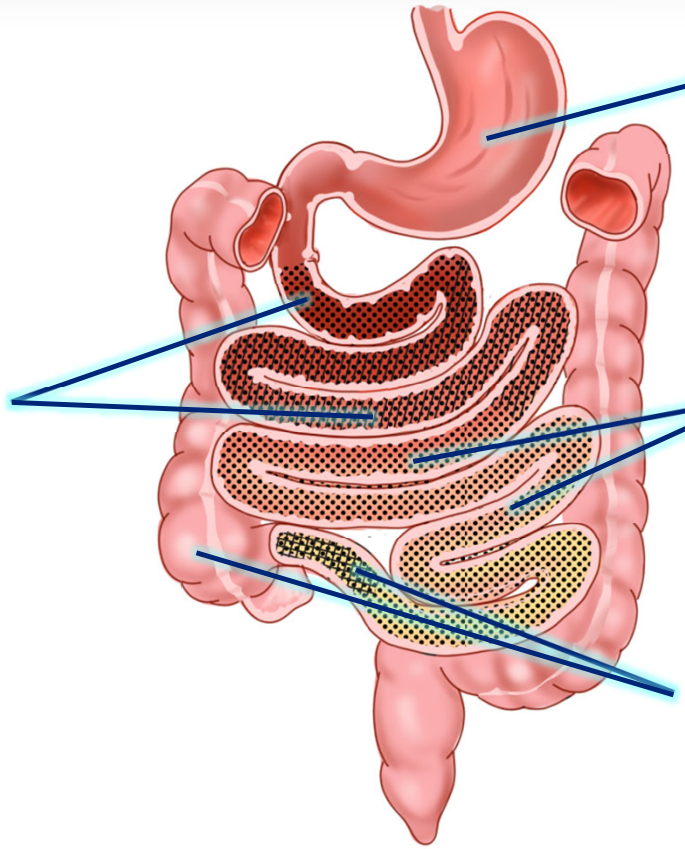




Vorsanger, M.H. et al. J Am Coll Cardiol. 2016;68(8):849-59.

Intestines Normally Secrete Variety of Hormones

Duodenum and jejunum
- Cholecystokinin (CCK)
- Secretin
- Glucose-dependent insulinotropic polypeptide (GIP)
- Vasoactive intestinal peptide (VIP)



Stomach
Gastrin

Jejunum and ileum
Neurotensin

Distal ileum and colon
- Peptide YY
- Glucagon-like peptide-(GLP) 1
- GLP-2

Tappenden KA. *JPEN J Parenter Enteral Nutr*. 2014;38(suppl 1):14S-22S.

Sites of Hormone Secretion in Intestines

Hormone	Site(s) of Secretion	Function(s)
Gastrin	**Stomach and duodenum**	▪ Increases gastric acid secretion ▪ Regulates iron homeostasis
CCK	**Duodenum, jejunum, and proximal ileum**	▪ Stimulates gallbladder contraction ▪ Enhances pancreatic secretions ▪ Inhibits gastric emptying ▪ Promotes satiety
Secretin	**Duodenum and jejunum**	▪ Increases pancreatic bicarbonate secretion ▪ Increases pepsinogen secretion ▪ Slows gastric emptying and gastric motility ▪ Inhibits gastric acid secretion
Glucose-dependent insulinotropic polypeptide	**Duodenum and jejunum**	▪ Has incretin effects ▪ Increases glucose transport across intestinal epithelium
Motilin	**Duodenum and jejunum**	▪ Regulates migrating motor complex ▪ Increases GI motility

Tappenden KA. *JPEN J Parenter Enteral Nutr*. 2014;38(suppl 1):14S-22S.

Sites of Hormone Secretion in Intestines (cont)

Hormone	Site(s) of Secretion	Function(s)
VIP	**Proximal small intestine and colon**	▪ Relaxes smooth muscle ▪ Increases blood flow and intestinal secretions ▪ Stimulates pancreatic bicarbonate secretion ▪ Reduces gastric acid secretion
Neurotensin	**Jejunum and ileum**	▪ Reduces gastric acid secretion and GI motility ▪ Stimulates pancreatic bicarbonate secretion
Peptide YY (PYY)	**Ileum and colon**	▪ Slows gastric emptying and small bowel transit ▪ Promotes satiety ▪ Reduces gastric acid and intestinal fluid secretion
GLP-1	**Ileum and colon**	▪ Incretin effects ▪ Inhibits gastric emptying ▪ Slows intestinal transit ▪ Promotes satiety
GLP-2	**Ileum and colon**	▪ Enhances small and large intestinal villus/crypt cell growth ▪ Maintains mucosal integrity ▪ Increases nutrient absorption

Tappenden KA. *JPEN J Parenter Enteral Nutr*. 2014;38(suppl 1):14S-22S.

US FDA Drugs approved for obesity
BMI > 27.5 + morbidity or BMI > 30

1. Phentermine (Adipex)
2. Diethylpropion (Tenuate)
3. Phendimetrazine (Bontril)
4. Benzphetamine (Didrex)
5. Orlistat (Xenical/Alli OTC)
6. Lorcaserin (Belviq)
7. Phentermine/topiramate (Qysmia)
8. Naltrexone/buproprion (Contrave)
9. Gelisis 100 superabsorbent hydrogel (Plenity)
10. Setmelanotide (Imcivree)***
11. Liraglutide (Saxendra)
12. Semaglutide (Ozempic/Wegovy/Rybelsus)
13. Tirzepatide (Zepbound)

***pro-opiomelanocortin (POMC), proprotein convertase subtilisin/kexin type 1 (PCSK1), or leptin receptor (LEPR) deficiency, or in adults with Bardet-Biedl Syndrome

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“We don’t need no stinking FDA” or Off label drugs for obesity

1. Metformin (insulin sensitivity)
2. Bupropion (NE, dopamine)
3. Topiramate (migraine, seizure, appetite)
4. Zonisamide (migraine/seizure, appetite)
5. Fluxoetine (Serotonin uptake inhibitor)
6. Exenatide (Byetta, Bydureon, GLP-1 agonist)*
7. Dulaglutide (Trulicity, GLP-1 agonist)*
8. Pramlintide (anti DM, slows gastric empty)
9. Canagliflozin (Invokana, SGLT2 inhibitor)
10. Dapaglifozin (Farxiga, SGLT2 inhibitor)
11. Empagliflozin (Jardiance, SGLT2 inhibitor)
12. Ertugliflozin (Steglatro, SGLT2 inhibitor)
13. Omega 3 fatty acids?

paraphrase of dialogue from
1948 film The Treasure of the Sierra Madre.

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Drug stigma –
Many anti-obesity drugs were banned so newer drugs are probably also detrimental

- Rimonabant [Acomplia, Zimulti] was withdrawn from Europe and world markets due to psychiatric side effects, including suicide (never FDA-approved medication)
- Sibutramine [Meridia] was withdrawn after SCOUT study demonstrated a 16% increase in non-fatal cardiovascular events in a high-risk population
- phentermine/fenfluramine (phenfen), dexfenfluramine [Pondimin, Redux] associated with pulmonary hypertension and valvular heart disease
- lorcaserin [Belviq] purported increased risk of cancer
- As the prohibited drugs have very different mechanisms of action, unable to generalize any potential anti-obesity drug is unacceptably harmful.

Lancet 2010;376(9740):517-23; N Engl J Med 2010;363(10):905-17; Expert Opinion on Drug Safety, 2015.14:2, 185-189

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Phentermine - sympatheticomimetic

- Short term use
- Schedule IV
- Alcohol/Drug interactions
- Contraindicated in pregnancy
- Insomnia, tachycardia, dry mouth, taste alterations, dizzy, tremor, headache, diarrhea, constipation, vomiting, anxiety, restlessness
- State regulations

Phentermine - may reduce weight in adults with overweight or obesity

- RCT 74 adults with overweight or obesity
- 12 week trial

- dropout rate
  - 7/37 active drug (1 adverse event)
  - 10/27 placebo

- phentermine vs. placebo daily

- ≥ 10% weight loss in 49% vs. 3%
- (p < 0.001, NNT 3)

- ≥ 5% weight loss in 87% vs.18%
  (p < 0.001, NNT 2)

- mean weight loss of 8.1 kg vs. 1.7 kg
  (p < 0.001)

Diabetes Obes Metab 2010 Oct; 12(10):876.
Diabetes Obes Metab 2011 Oct; 13(10):963

Phentermine – not used much (enough?)

- Amphetamine addiction
- Fenfluramine [dexfenfluramine]-phentermine scandal
- Side effects
- Affordability
- Is obesity a disease?
- Stigma of obesity
- Stigma of “diet doctor”

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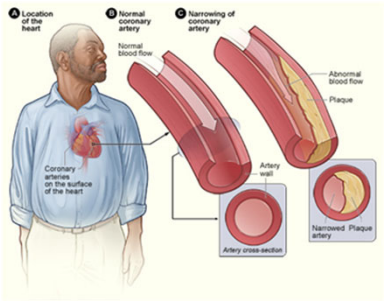
orlistat - clinically significant weight loss reduces weight regain over 2-3 years

- randomized trial 743 patients (BMI 28-47 kg/m2)
- 15 European sites
- Single blind, placebo lead-in period
- hypocaloric diet (600 kcal/day deficit) 4 weeks
- 688 patients who completed lead-in
- orlistat 120 mg vs. oral placebo
- at 1 year, orlistat group lost more weight
  - average loss 10.2% vs. 6.1%
- at 2 years, patients who continued with orlistat
  - regained about half as much weight as placebo

Lancet 1998 Jul 18;352(9123):167;
Lancet 1998 Oct 31;352(9138):1473

orlistat Xenical 120 mg or Alli OTC 60 mg

- reductions in total cholesterol, LDL cholesterol, blood pressure
- improvements in glucose and insulin
- improvements in QOL, overweight distress and satisfaction with treatment
- interfere with fat-soluble drugs and vitamins.
- most common side effects reported were non-systemic and were primarily gastrointestinal. These effects generally occurred early in treatment and were self-limited and of short duration in most cases.
- Not restricted to BMI > 30 as other weight loss medications



Gelesis 100 oral superabsorbent hydrogel (Plenity)

- reductions nonsystemic agent for weight management
- oral ultra-absorbent hydrogel occupies space in the stomach and small intestine, stimulates satiety signals
- dosing and administration: 3 capsules (2.25 g total) orally, taken 20-30 minutes prior to lunch and dinner with 16 ounces (about 500 mL) of water
- total cholesterol, LDL cholesterol, blood pressure
- improvements in glucose and insulin
- improvements in QOL, overweight distress and satisfaction with treatment
- interfere with fat-soluble drugs and vitamins.
- most common side effects reported were non-systemic and were primarily gastrointestinal. These effects generally occurred early in treatment and were self-limited and of short duration in most cases.
- FDA restricted to BMI 25-40

Ann Pharmacother 2021 Sep;55(9):1146

Liraglutide: Saxenda, Victoza

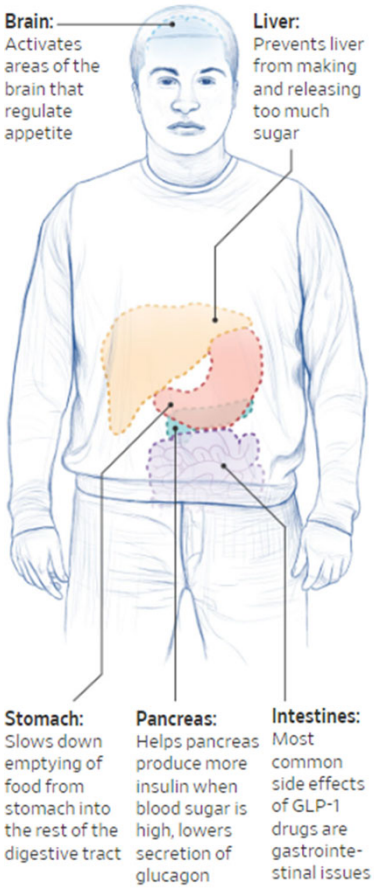
- **Glucagon**
  - activating hepatic glucagon receptors
  - increases blood glucose concentration (gluconeogenesis)
  - stimulating glycogen breakdown (glycogenolysis)
  - release of glucose from the liver

- **Liraglutide GLP-1 agonist**
  - acylated human glucagon-Like peptide-1 (GLP-1) receptor agonist
  - increase insulin release in the presence of elevated glucose concentrations
  - Decrease glucagon secretion in a glucose-dependent manner
  - delay gastric emptying
  - reduces postprandial glucose
  - regulates appetite and calorie intake

Semaglutide: Ozempic, Wegovy, Rybelsis

How Ozempic works in the body

Ozempic and similar drugs mimic a naturally occurring gut hormone called glucagon-like peptide 1, or GLP-1, which binds to and activates receptors in various parts of the body that can have beneficial effects for diabetes and obesity.



Sources: Novo Nordisk; FDA ; Mayo Clinic (anatomy)
Jemal R. Brinson/THE WALL STREET JOURNAL

Semaglutide Ozempic Wegovy (Rybelsis)

WARNING: RISK OF THYROID C–CELL TUMORS

See full prescribing information for complete boxed warning.

- **In rodents, semaglutide causes thyroid C-cell tumors at clinically relevant exposures. It is unknown whether WEGOVY® causes thyroid C-cell tumors, including medullary thyroid carcinoma (MTC), in humans as the human relevance of semaglutide-induced rodent thyroid C-cell tumors has not been determined (5.1, 13.1).**
- **WEGOVY® is contraindicated in patients with a personal or family history of MTC or in patients with Multiple Endocrine Neoplasia syndrome type 2 (MEN 2). Counsel patients regarding the potential risk of MTC and symptoms of thyroid tumors (4, 5.1).**

wegovy®

semaglutide injection 2.4 mg

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use WEGOVY® safely and effectively. See full prescribing information for WEGOVY®.

WEGOVY® (semaglutide) injection, for subcutaneous use

Initial U.S. Approval: 2017

WARNING: RISK OF THYROID C–CELL TUMORS

See full prescribing information for complete boxed warning.

- **In rodents, semaglutide causes thyroid C-cell tumors at clinically relevant exposures. It is unknown whether WEGOVY® causes thyroid C-cell tumors, including medullary thyroid carcinoma (MTC), in humans as the human relevance of semaglutide-induced rodent thyroid C-cell tumors has not been determined (5.1, 13.1).**
- **WEGOVY® is contraindicated in patients with a personal or family history of MTC or in patients with Multiple Endocrine Neoplasia syndrome type 2 (MEN 2). Counsel patients regarding the potential risk of MTC and symptoms of thyroid tumors (4, 5.1).**

——— RECENT MAJOR CHANGES ———

Indications and Usage (1) 12/2022
Dosage and Administration (2.1, 2.3) 12/2022
Warnings and Precautions (5.3, 5.6, 5.8) 12/2022

——— INDICATIONS AND USAGE ———

WEGOVY® is a glucagon-like peptide-1 (GLP-1) receptor agonist indicated as an adjunct to a reduced calorie diet and increased physical activity for chronic weight management in:

- adult patients with an initial body mass index (BMI) of
  - 30 kg/m^2 or greater (obesity) or
  - 27 kg/m^2 or greater (overweight) in the presence of at least one weight-related comorbid condition (e.g., hypertension, type 2 diabetes mellitus, or dyslipidemia) (1).
- pediatric patients aged 12 years and older with an initial BMI at the 95th percentile or greater for age and sex (obesity) (1).

Limitations of Use:

- WEGOVY® should not be used in combination with other semaglutide-containing products or any other GLP-1 receptor agonist (1).
- The safety and efficacy of coadministration with other products for weight loss have not been established (1).
- WEGOVY® has not been studied in patients with a history of pancreatitis (1).

——— DOSAGE AND ADMINISTRATION ———

- Administer WEGOVY® once weekly, on the same day each week, at any time of day, with or without meals (2.2).
- Inject subcutaneously in the abdomen, thigh or upper arm (2.2).
- In patients with type 2 diabetes, monitor blood glucose prior to starting and during WEGOVY® treatment (2.2).
- Initiate at 0.25 mg once weekly for 4 weeks. In 4 week intervals, increase the dose until a dose of 2.4 mg is reached (2.3).
- The maintenance dose of WEGOVY® is 2.4 mg once weekly (2.3).

——— DOSAGE FORMS AND STRENGTHS ———

Injection: pre-filled, single-dose pen that delivers doses of 0.25 mg, 0.5 mg, 1 mg, 1.7 mg or 2.4 mg (3).

——— CONTRAINDICATIONS ———

- Personal or family history of medullary thyroid carcinoma or in patients with Multiple Endocrine Neoplasia syndrome type 2 (4, 5.1).
- Known hypersensitivity to semaglutide or any of the excipients in WEGOVY® (4).

——— WARNINGS AND PRECAUTIONS ———

- *Thyroid C-cell Tumors:* See Boxed Warning (5.1).
- *Acute Pancreatitis:* Has occurred in clinical trials. Discontinue promptly if pancreatitis is suspected. Do not restart if pancreatitis is confirmed (5.2).
- *Acute Gallbladder Disease:* Has occurred in clinical trials. If cholelithiasis is suspected, gallbladder studies and clinical follow-up are indicated (5.3).
- *Hypoglycemia:* Concomitant use with an insulin secretagogue or insulin may increase the risk of hypoglycemia, including severe hypoglycemia. Reducing the dose of insulin secretagogue or insulin may be necessary. Inform all patients of the risk of hypoglycemia and educate them on the signs and symptoms of hypoglycemia (5.4, 7.1).
- *Acute Kidney Injury:* Has occurred. Monitor renal function when initiating or escalating doses of WEGOVY® in patients reporting severe adverse gastrointestinal reactions or in those with renal impairment reporting severe adverse gastrointestinal reactions (5.5).
- *Hypersensitivity Reactions:* Anaphylactic reactions and angioedema have been reported postmarketing. Discontinue WEGOVY® if suspected and promptly seek medical advice (5.6).
- *Diabetic Retinopathy Complications in Patients with Type 2 Diabetes:* Has been reported in trials with semaglutide. Patients with a history of diabetic retinopathy should be monitored (5.7).
- *Heart Rate Increase:* Monitor heart rate at regular intervals (5.8).
- *Suicidal Behavior and Ideation:* Monitor for depression or suicidal thoughts. Discontinue WEGOVY® if symptoms develop (5.9).

——— ADVERSE REACTIONS ———

Most common adverse reactions (incidence ≥ 5%) in adults or pediatric patients aged 12 years and older are: nausea, diarrhea, vomiting, constipation, abdominal pain, headache, fatigue, dyspepsia, dizziness, abdominal distension, eructation, hypoglycemia in patients with type 2 diabetes, flatulence, gastroenteritis, and gastroesophageal reflux disease, and nasopharyngitis (6.1).

To report SUSPECTED ADVERSE REACTIONS, contact Novo Nordisk Inc., at 1-833-934-6891 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

——— DRUG INTERACTIONS ———

WEGOVY® delays gastric emptying. May impact absorption of concomitantly administered oral medications. Use with caution (7.2).

——— USE IN SPECIFIC POPULATIONS ———

- *Pregnancy:* May cause fetal harm. When pregnancy is recognized, discontinue WEGOVY® (8.1).
- *Females and Males of Reproductive Potential:* Discontinue WEGOVY® at least 2 months before a planned pregnancy because of the long half-life of semaglutide (8.3).

See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.

Revised: 12/2022

Tirzepatide: Mounjaro, Zepbound

- a novel glucose-dependent insulinotropic polypeptide and glucagon-like peptide-1 receptor agonist
- 2539 obese patients in phase 3 double-blind, randomized, controlled trial, we assigned 2539 adults
- At baseline, mean weight 104.8 kg, the mean BMI 38.0
- at week 72, mean weight change
  - 15.0% 5-mg weekly doses
  - 19.5% 10-mg doses
  - 20.9% 15-mg doses
  - 3.1% with placebo
- most common adverse events were gastrointestinal, mild to moderate in severity
- treatment discontinuation in 4.3%, 7.1%, 6.2%, and 2.6% of participants receiving 5-mg, 10-mg, and 15-mg tirzepatide doses and placebo

SURMOUNT-1 N Engl J Med. 2022 Jul 21;387(3):205-216
Eli Lilly Approved for DM2 in 2022

Benefits of GLP1 and GLP 1/GIP

- Weight loss
- Diabetes 2
- Cardiovascular
  - Improve lipid profile
  - Sleep apnea
  - Decrease blood pressure
- Liver steatosis
- Kidney
- Neurological
  - Neurodegenerative as Alzheimers, Parkinsons
  - CVA

- GLP1 Glucagon like peptide 1 (ileum and colon L cells)
- GIP Glucose dependent insulinotropic polypeptide (duodenum, jejunum)
  - Stimulates insulin production and release from pancreas
  - Increase cAMP in beta cells, increase insulin secretion
  - Stimulate somatostatin secretion
  - inhibit glucagon secretion
  - Appetite suppression, mostly in CNS
  - Increase thermogenesis in adipocytes
  - Increased natriuresis

IT HAPPENED ON LONG ISLAND

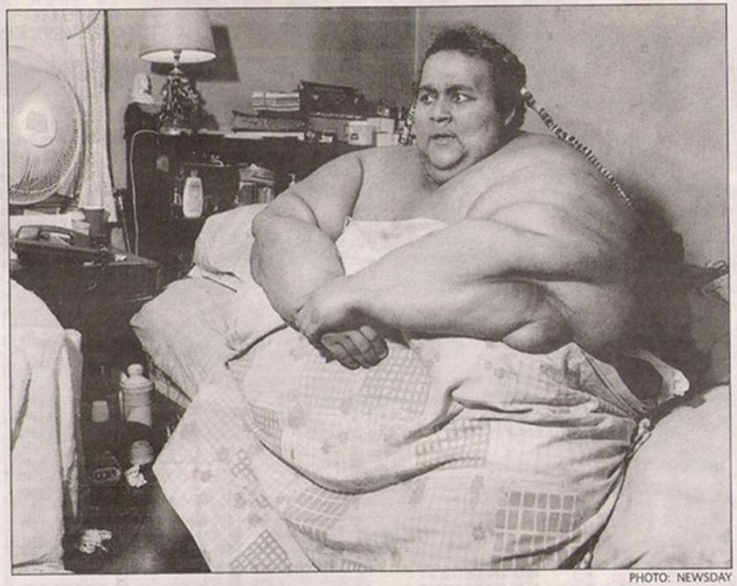


PHOTO: NEWSDAY

1987: World's Heaviest Man is Stuck in Hempstead Doorway

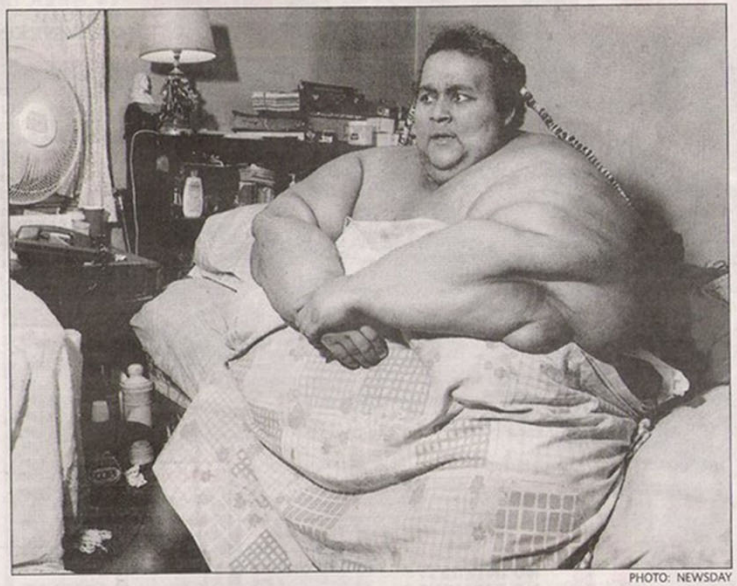
In 1987, Walter Hudson caught the public's attention when rescue workers freed him after he had become wedged in the doorway of his Hempstead home. At that time, he weighed more than 1,000 pounds. Aided by comedian and health guru Dick Gregory, Hudson subsequently lost hundreds of pounds, and was able to leave his house for the first time in 18 years in 1988. Hudson ran a catalogue company that sold clothes for large women, conducting business from his home. When he died of a heart attack in 1991, 46-year-old Hudson weighed a reported 1,125 pounds. To remove his body, emergency workers cut a hole in his bedroom wall, then used a forklift. "The Guinness Book of World Records" once dubbed Hudson the heaviest man on earth, with a waistline that was nine feet in diameter. He is shown here in an undated photo. — Cynthia Blair

NEXT: MOLLOY COLLEGE FOUNDED

Newsday

A FEATURE PRODUCED BY THE NEWSDAY MARKETING DEPARTMENT A51

IT HAPPENED ON LONG ISLAND



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NEXT: MOLLOY COLLEGE FOUNDED

Martin Luther King Jr., PhD

Dick Gregory, comedian, health guru

If ice is a food,

How many calories does it have?

Introducing the world's first and only negative calorie food, and what it means to those trying to lose weight.

THE ICE DIET

Brian C. Weiner, MD, MS, FACP, AGAF

Book price – less than the cost of 1 shot of semaglutide!