



NUTRITION & OBESITY IN INDIVIDUALS WITH I/DD

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Objectives

- Increase the knowledge, comfort and confidence of providers for lifestyle recommendations for the treatment of obesity (dispel “myths”)
- Review medication options for I/DD patients with obesity
- Resources/links embedded for reference

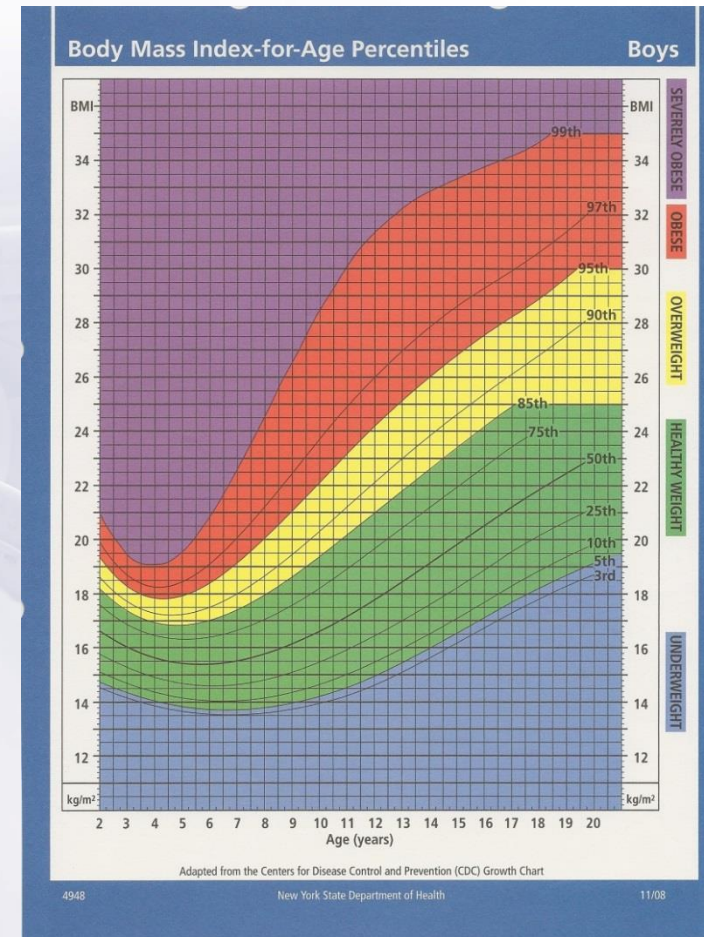
Disclosures

- No financial disclosures

The Pediatric BMI %

DISEASE RISK – cholesterol, blood sugar, fatty liver

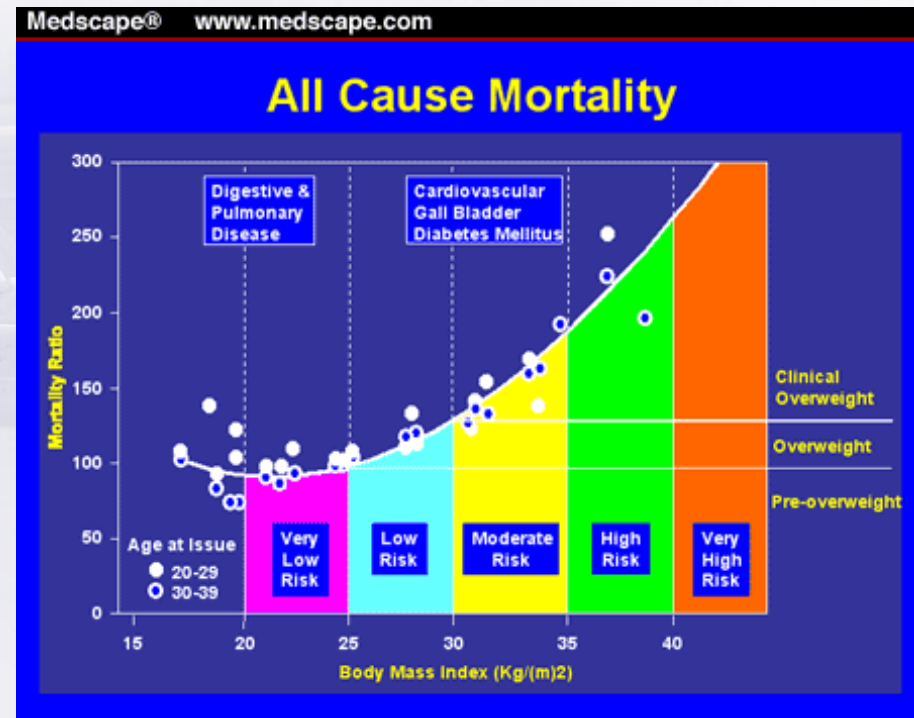
- **<5%** **underweight**
 - **>5-85%** **normal/healthy**
 - **>85-95%** **overweight (OW)**
 - **> 95%** **obese (OB)**
 - **> 99%** **severely obese**
-
- BMI should be **plotted at yearly at CPE for screening (not treatment)**



Why those cut offs for adults

DEATH RISK

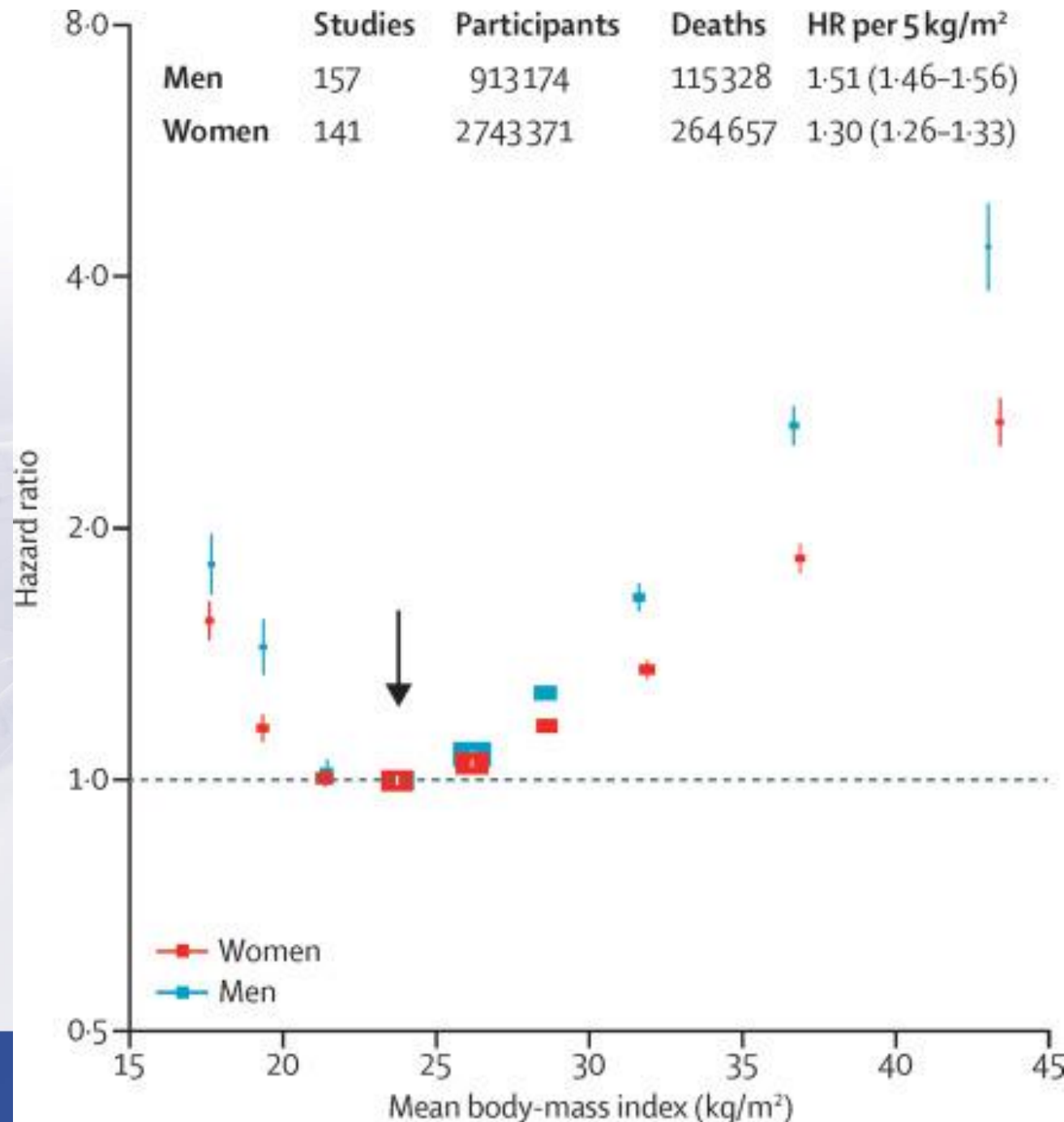
- **Lowest risk of death for BMI 18.5-24.9**
- Higher risk with “underweight”, “overweight” and **MUCH higher risk for all classes of obesity**



BMI and Mortality

Lancet 2016

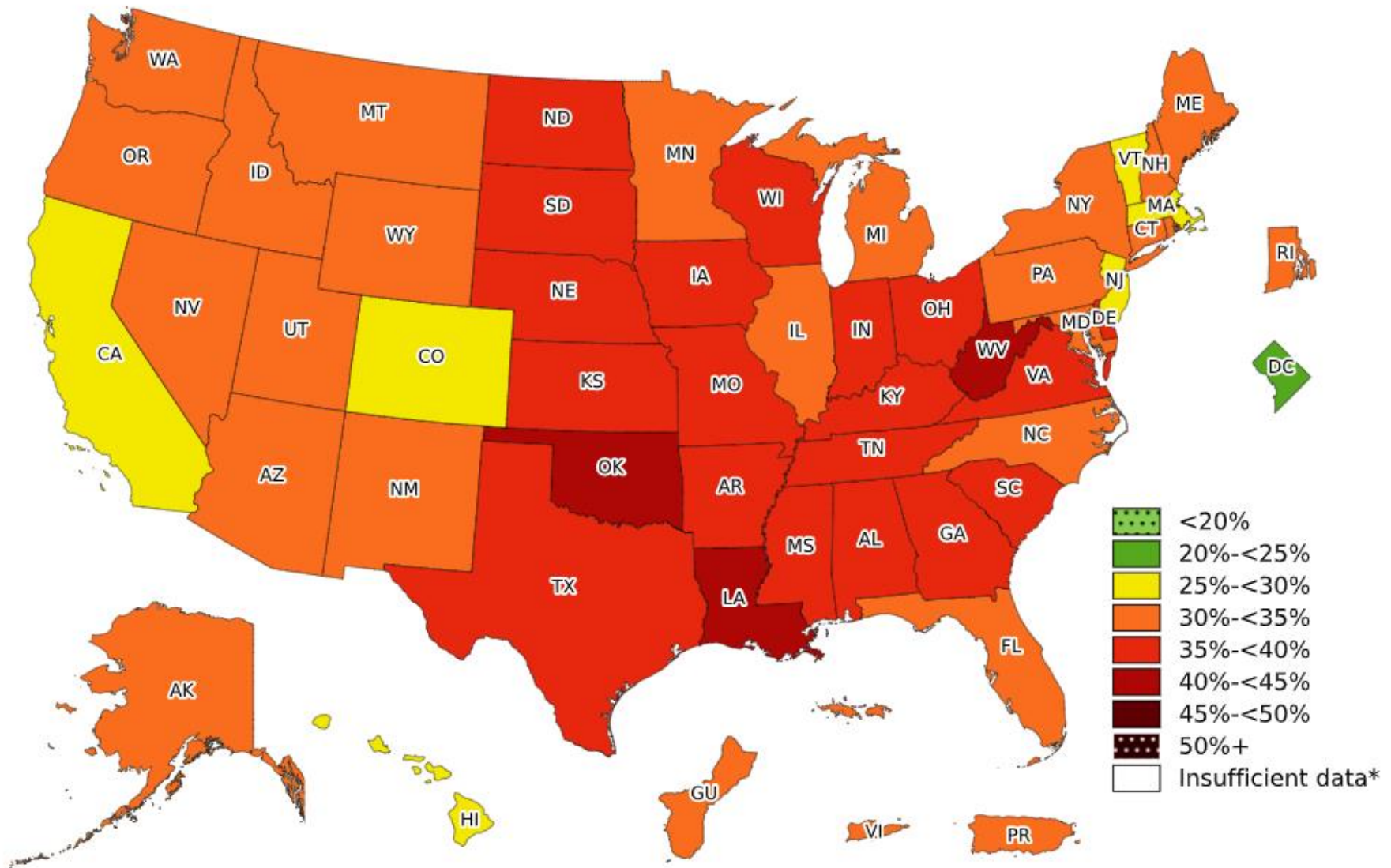
<https://www.thelancet.com/journals/lancet/article/PIIS0140-67361630175-1/fulltext>



BMI definitions in Adults

- <http://www.nhlbisupport.com/bmi/>
 - 18.5-24.9 Healthy BMI
 - 25-29.9 Overweight
 - 30-34.5 Class I Obesity
 - 35-39.9 Class II Obesity
 - > 40 Class III Obesity (morbid) 100#+
 - >50 “Super obesity” 150#+

“Self reported obesity in Adults” 2022 BRFSS



“Self reported obesity in Adults” 2022 BRFSS

State Highest % Prevalence

1) **West Virginia**

41

2) Louisiana	40.1
3) Oklahoma	40
4) Mississippi	39.5
5) Tennessee	38.9
6) Alabama	38.3
7) Ohio	38.1
8) Delaware	37.9
9) Indiana	37.7
10) Kentucky	37.7
11) Wisconsin	37.7
12) Arkansas	37.4
13) Iowa	37.4
14) Georgia	37
15) South Dakota	36.8
16) Missouri	36.4
17) Kansas	35.7
18) Texas	35.5
19) North Dakota	35.4
20) Nebraska	35.3

State Lowest % Prevalence

1) **District of Columbia** **24.3**

2) Colorado	25
3) Hawaii	25.9
4) Vermont	26.8
5) Massachusetts	27.2
6) California	28.1
7) New Jersey	29.1
8) New York	30.1
9) New Hampshire	30.2
10) Montana	30.5
11) Connecticut	30.6
12) Rhode Island	30.8
13) Oregon	30.9
14) Utah	31.1
15) Florida	31.6
16) Washington	31.7
17) Alaska	32.1
18) Virgin Islands	32.1
19) New Mexico	32.4
20) Guam	32.7

Current Prevalence of Obesity

- **CDC Feb 2021: 42.4% of US adults** were considered obese in 2017-2018
- The prevalence of severe obesity in adults was 9.2% - **higher in women than in men.**
 - highest in non-Hispanic black adults compared with other race and Hispanic-origin groups.
 - highest among adults aged 40–59 compared with other age groups.

BMI for Asian Americans

- Far East
 - China, Japan, Korea, and Mongolia
- Southeast Asia
 - Cambodia, Malaysia, the Philippine Islands, Thailand, Vietnam, Indonesia, Singapore, Laos, etc
- Indian subcontinent
 - India, Pakistan, Bangladesh, Bhutan, Sri Lanka, and Nepal

BMI for Asian Americans

Comprehensive analysis of the association between BMI and DM in Asian Americans illustrates:

- higher prevalence of type 2 diabetes at relatively lower BMI cut points than whites
- WHO - Overweight BMI ≥ 23 in Asians
- WHO - Obese BMI ≥ 25 in Asians

<https://diabetesjournals.org/care/article/38/1/150/37769/BMI-Cut-Points-to-Identify-At-Risk-Asian-Americans>

CDC Obesity in I/DD adults ...from 2017

- Rates of obesity among adults with I/DD is as high as 58.5% in the United States.
- The consequences of obesity predispose adults with I/DD to a greater risk of secondary health conditions that can impair their health status and quality of life.

https://www.aucd.org/template/news.cfm?news_id=13080&id=17#:~:text=The%20Center%20for%20Disease%20Control,58.5%25%20in%20the%20United%20States

Pediatric I/DD data2016

- Obesity prevalence for children with I/DD was 28.9% and 15.5% for children without I/DD.
- Prevalence of obesity among youth with I/DD was almost double that of the general population.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4903873/pdf/nihms745803.pdf>

Pediatric Obesity: *The Oncoming Tsunami*

80% obese children become obese adults

Young adults will accumulate **greater exposure to metabolic and mechanical damage** from being OW/OB

Are at increased risk for chronic health conditions such as CAD, DMII

Deaths from HHNS and OSA

Public Health

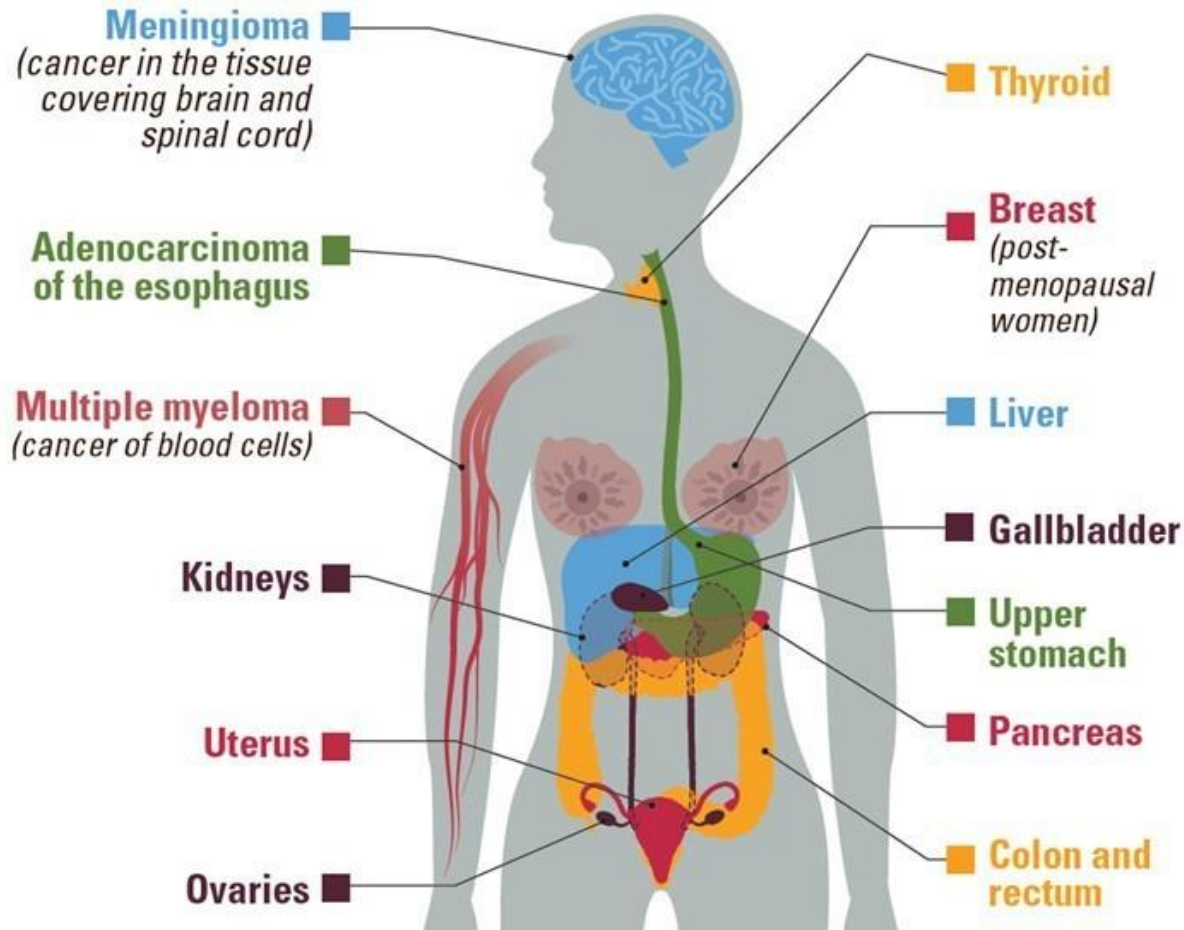
- **More chronic conditions** are related to OBESITY than smoking, drinking or poverty
- **13 obesity related cancers** (NEJM 2016)

Forbes, “The Business of Obesity, What it Costs Us” Mar 2013

<http://www.forbes.com/sites/bethhoffman/2013/03/22/the-business-of-obesity/>

13 Obesity Related Cancers (NEJM 2016)

<https://www.nejm.org/doi/pdf/10.1056/NEJMSr1606602>



Selecting Obesity Treatment

Treatment

BMI

	25 -26.9	27- 29.9	30 -34.9	35-39.9	≥ 40
Diet/Exercise Behavioral	+	+	+	+	+
Pharmaco- therapy	**Plenity	Co- morbidity	+	+	+
Surgery			<i>Band**</i>	Co- morbidity	+

RF for obesity

Many...and there is usually more than one at play

- Genetics and Epigenetics
- SDoH (SES and access to care)
- Family history/environment
 - Parental obesity increases risk
- Medications
 - Antipsychotics (but safety trumps weight)
 - Steroids
 - DEPO (is there another alternative?)

Myths about Diet

- Education on healthy diets is poor
 - “Carbs are bad”
- The FDA -
 - Allows food additives etc that are prohibited in many other countries
 - Lack of clear labeling on food for patients
- Lack of understanding of “amount of food” and calories
 - You can lose weight eating junk food, gain it being vegetarian.
- Worrisome advice on social media

Refeeding Sx

New pt to the office -

22 yo Autistic pt BMI 36

Mother primary care giver, *overwhelmed*.

Pt is non-verbal

Diet consisted of french fries.....that's it

She would not take any pills.

Brown/beige food diet

- 2019 study revealed 70% of children dx with autism spectrum disorder had food aversions

<https://www.sciencedirect.com/science/article/abs/pii/S1750946719300595?via%3Dihub>

- 92% preferred grain products and/or chicken (usually nuggets)
- Avoidant Restrictive Food Intake Disorder (ARFID)

<https://autismspectrumnews.org/evaluating-and-treating-restrictive-eating-in-children-with-autism/>

<https://www.autismspeaks.org/sensory-issues#:~:text=Many%20autistic%20people%20experience%20hypersensitivity,people%20can%20easily%20tune%20out>

Atypical eating behaviors:

- Autism (70.4%)
- Children with other disorders (13.1%)
- Typical children (4.8%).

The most common behavior:

- Limited food preferences (88%)
- Hypersensitivity to food textures (46%)
- Other peculiar patterns most often eating only one brand of food (27%)
- Pocketing food without swallowing (19%), and pica (12%)

<https://www.sciencedirect.com/science/article/abs/pii/S1750946719300595?via%3Dihub>

Back to our patient: Refeeding Sx

- *Undetectable* vit D
- Very high PTH (secondary hyperparathyroidism)
- B12 60MCV 120!
- Low Phos, Mg, K, Fe, Zn

3 wk hospitalization

- TF given in hospital, liquid vitamins

She became MORE obese...



Vegan raw food influencer who ate all-fruit diet allegedly dies of malnutrition, infections

Zhanna Samsonova, known as Zhanna D'Art on social media, claimed she had lived on a 'fully fruit-based-low-fat diet' for the past five years

National Post Staff

Published Aug 04, 2023 • Last updated 5 days ago • 3 minute read

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Samsonova claimed she had been subsisting on a completely raw vegan diet for more than a decade. PHOTO BY INSTAGRAM

A vegan social media influencer whose videos about her raw tropical fruit diet had accumulated billions of views on TikTok has died at age 39.

Diet history is important:
you can be malnourished even if you are obese:

Don't forget Red Flag pts:
Autistic or I/DD
Sensory issues
Elderly
ETOH/substance abuse

Restrictive Eating – Avoiding Nutritional Complications

- Consider a MVI daily
 - Will treat Vit C deficiency - Scurvy
 - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7671015/>
- Vitamin D deficiency is VERY common
 - Comes from fatty fish... NOT dairy
 - **KEEP A MAINTENANCE DOSE**
- Consider BW to evaluate for nutritional deficiencies
- If they are on PPIs chronically evaluate for divalent cation deficiency:
 - Mg, Phos, Fe, B12

Environmental Factors Promoting Obesity

DIETARY

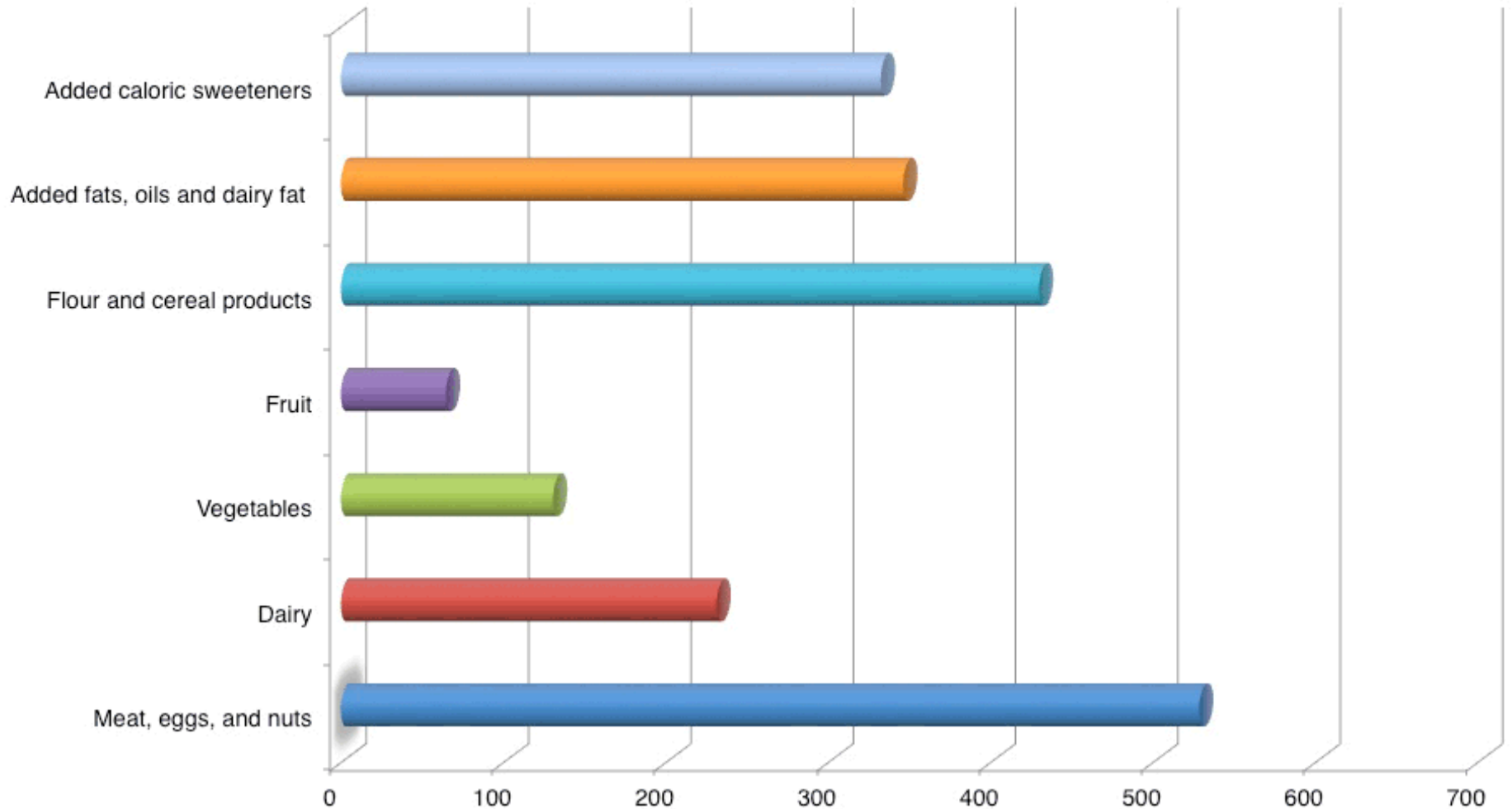
- ↑ Energy density of foods
- ↑ Portion size
- ↑ Variety*
- ↑ Palatability
- ↑ Availability
- ↓ Cost
- ↑ Caloric beverages (sugar-sweetened beverages)

ACTIVITY

- ↑ Sedentary behavior
- ↓ Activities of daily living
- ↓ Employment physical activity

1970

Total Calories Per Person: 2064



The Obesogenic Environment

- “Promoting excess weight gain”

The Obesogenic Environment

- Restaurants know how to keep you at the table and how to get you to eat MORE:
 - Dim lighting – incr time, feeling of comfort
 - Seeing/smelling food increases unplanned consumption
 - Variety of food (salt/sweet, spicy)
 - Size of bowls, plates
 - Leaving serving platters on the table

The Obesogenic Environment

- Restaurants know how to get you to eat MORE:
 - Soft or preferred music
 - Eating with familiar people/many people
 - Increasing distractions....
 - Eating in front of a TV
 - Reading

The Obesogenic Environment

- Food manufacturers
 - “Truth in labeling”



The Obesogenic Environment

- Food manufacturers
 - “Truth in labeling”
 - “Vanishing caloric density” - Cheetos
 - Lacking a dominant flavor – Doritos

The Obesogenic Environment

- Food manufacturers
 - Rats were fed rice cakes, Oreos or gave them injections of cocaine or morphine

.....what happened?

The Obesogenic Environment



- **cookies** had a greatest effect on the pleasure center of the brain
- SUGAR – “Fed Up” “That Sugar Film”

Obesity prevention behaviors include:

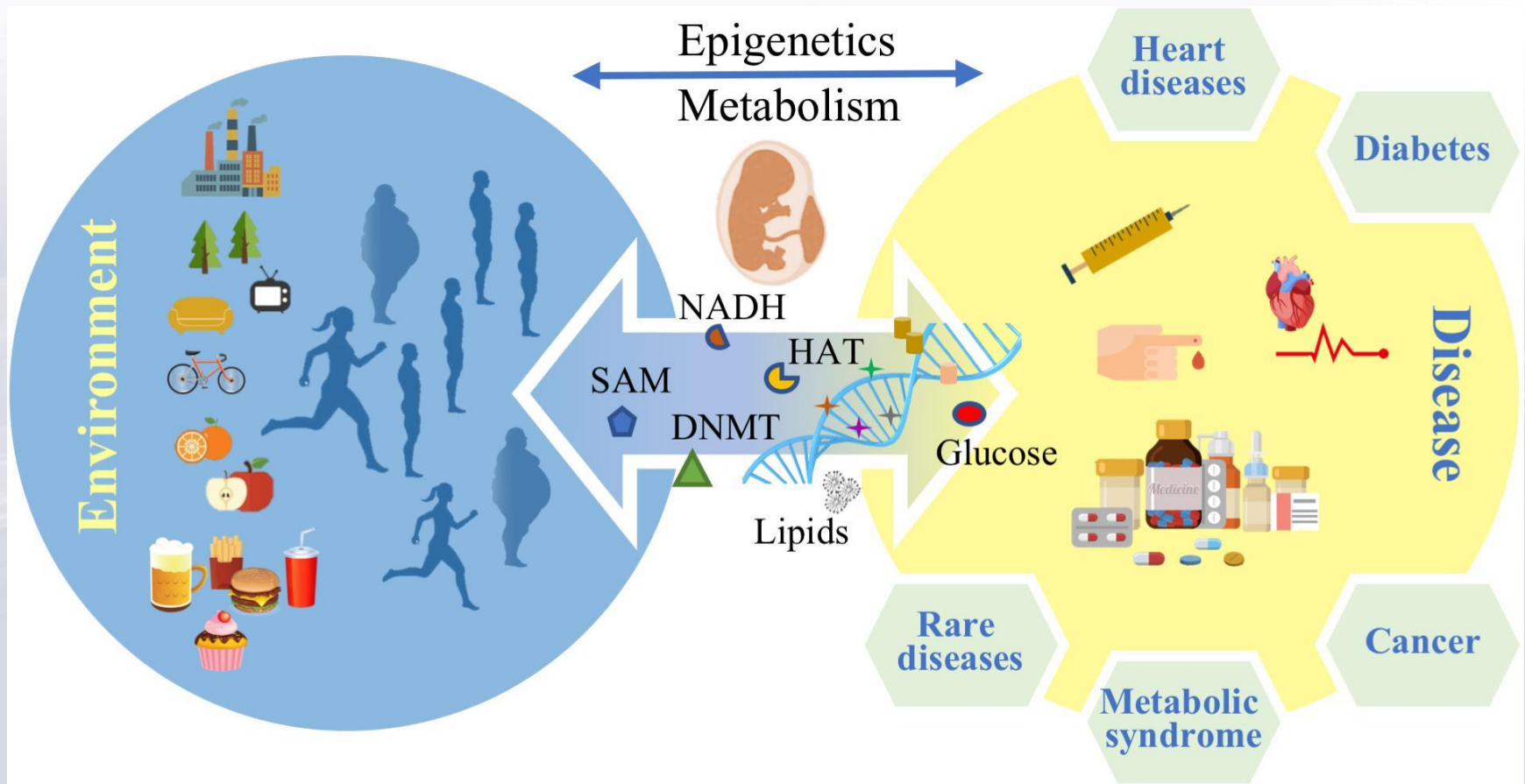
- 5 servings of fruits/vegetables per day
- **Sleeping 6-9 hours/night**
 - **Lack of sleep is a RF for obesity (OSA, shift work...RESIDENCY!!)**
- Eating 25 g of fiber a day
- Exercising for 45-60 minutes a day

National Weight Control Registry – Brown

Difficult (.....? *impossible*) to “out
exercise” your “bad” dietary habits
...snacks ...sugared drinks.. (70kg)

Doughnut	230 kcal	59 min walking
Pizza	320 kcal	39 min swimming
Egg McMuffin	300 kcal	32 min running
Lg Fries	540 kcal	77 min biking

Epigenetics – exciting!





**19 pound baby, heaviest born, Indonesia
September 23, 2009**

Influence of Prenatal Environment

- Maternal nutrition during pregnancy alters the function of the DNA (**epigenetic change**)
 - “**Susceptibility to obesity** can be triggered by influences on the baby developing in the womb, **including WHAT the mother ate**”

Influence of Prenatal Environment – Dutch Potato Famine

- Studied Hts and Wts of 371,100 men in the Netherlands born b/w 1943 -1947, examined for military service at age 19, *including men with and without prenatal exposure to the famine.*
- Heightened OW risk was present in men with famine exposure starting at the very beginning of gestation, not with exposure starting in the middle or at the end of gestation - points to the start of pregnancy as a sensitive period of fetal development.

Reduce Impact of Ob Genes by Exercise

- Nov 2011 – PloS Medicine
 - Meta-analysis 5 studies
 - 218,000 participants
 - FTO gene:
 - *risk of becoming obese was 27 percent lower in those who were physically active.*

Reduce Impact of Ob Genes by Exercise

- April 2010 – 20,000 individuals. 3+ yr F/U
 - *a physically active lifestyle is associated with*
 - **a 40% reduction in the genetic predisposition to common obesity**
 - as estimated by the number of risk alleles carried for any of the 12 genetic markers.

Taking a Dietary History

- Dietary recall is POOR
 - Diet logs, even if partial, give more information:
 - BF, lunch, dinner
 - Snacks
 - LIQUID intake (esp sugared beverages)
 - % milk
- Online trackers
 -The devil is in the details
 - Portion size matters

Taking a Dietary History

- WHO do they get food from?
- Do they get school BF and lunch?
 - The federal school lunch program is intended for children who do not have access to food at home
 - It is NOT well suited for children with obesity and metabolic disease:
 - preDMII, DMII, fatty liver/NASH, dyslipidemia

Healthy Hunger-Free Kids Act

	Grades K-5	Grades 6 – 8	Grades 9 – 12
Breakfast	350 - 500 kcal	400 – 550 kcal	450 – 600 kcal
Lunch	550 – 650 kcal	600 – 700 kcal	750 – 850 kcal
Total calories	900-1125 kcal	1000-1250 kcal	1200-1450 kcal
AHA recommendation	1200-1400 kcal	1600-1800 kcal	1800-2200 kcal
<i>This does NOT include snacks, dinner or desserts</i>			

Calculating BMR 15 yr and older

<https://www.calculator.net/bmr-calculator.html?ctype=standard&cage=28&csex=m&cheightfeet=5&cheightinch=10&cpound=200&cheightmeter=180&ckg=60&cmop=0&coutunit=c&cformula=m&cfatpct=20&x=41&y=15>

Wt loss 1
pound wk =
500 cal less
than activity
level

Here = 1760
if sedentary

Calculator.netFINANCIALFITNESS & HEALTH

home / fitness & health / bmr calculator

BMR Calculator

The *Basal Metabolic Rate (BMR) Calculator* estimates your basal metabolic rate—the amount of energy expended while at rest in a neutrally temperate environment, and in a post-absorptive state (meaning that the digestive system is inactive, which requires about 12 hours of fasting).

US Units

Metric Units

Other Units

Age

ages 15 - 80

Gender

☒ male ☐ female

Height

feet inches

Weight

pounds

[+ Settings](#)

Calculate

Clear

Result**BMR = 1,883** Calories/day

Daily calorie needs based on activity level

Exercise: 15-30 minutes of elevated heart rate activity.
Intense exercise: 45-120 minutes of elevated heart rate activity.
Very intense exercise: 2+ hours of elevated heart rate activity.

Calculating Pediatric BMR < 15 yo

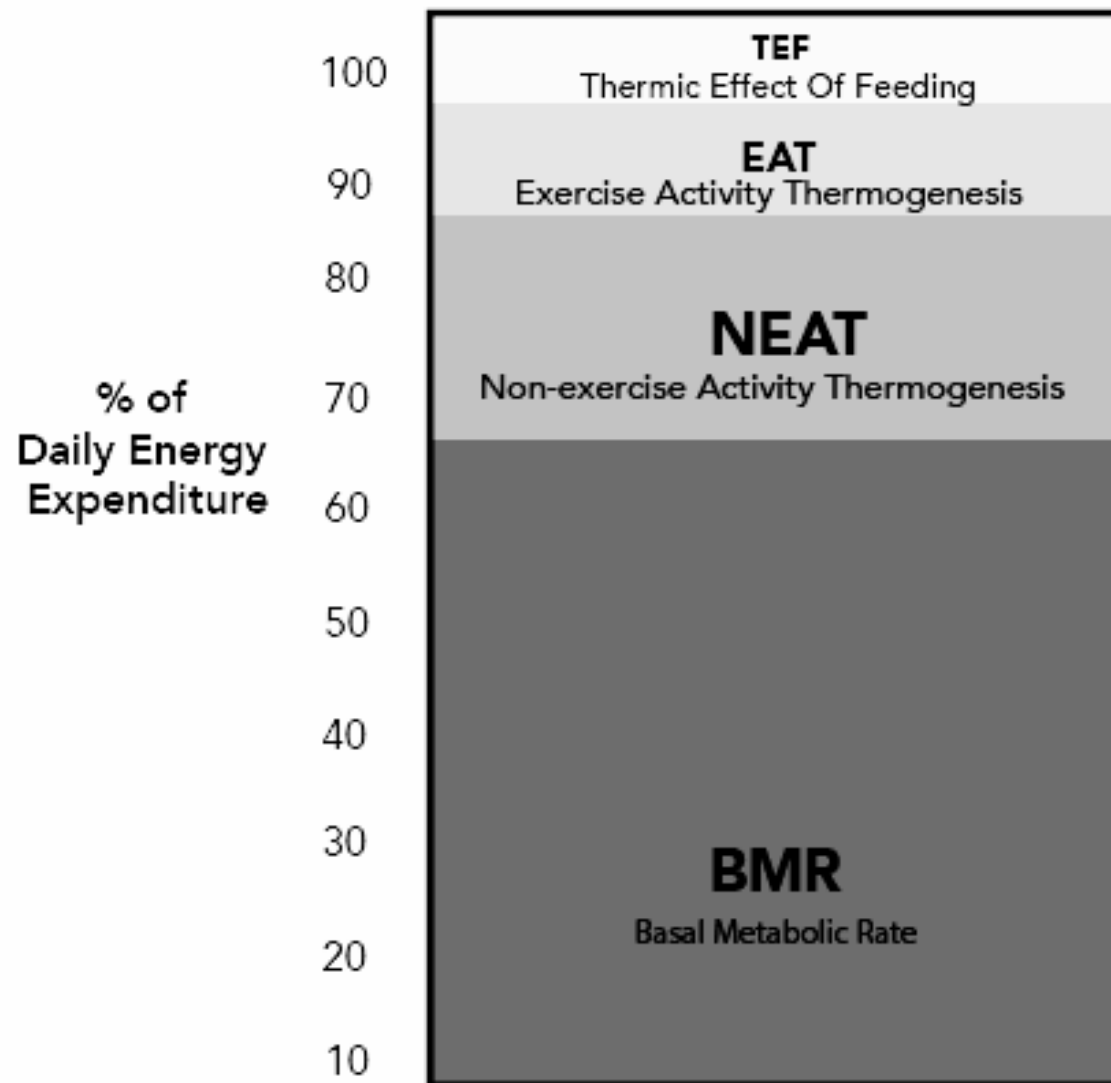
<http://www.bmrcalculator.org/>

BMR Calculator Inputs	
Age:	<input type="text" value="13"/> Years
Gender:	<input type="radio"/> Male <input checked="" type="radio"/> Female
Weight:	<input type="text" value="170"/> <input checked="" type="radio"/> lbs <input type="radio"/> Kg
Height:	<input checked="" type="radio"/> Feet/Inches <input type="radio"/> Cms <input type="text" value="5"/> Feet <input type="text" value="3"/> Inches
<input type="button" value="Calculate Your BMR"/>	

Your BMR: 1546 Calories/Day

ned a Day Depending on Activity Level:

Description	Calories Burned Per Day
You get little to no exercise	1855 Calories/Day
You exercise lightly (1–3 days per week)	2125 Calories/Day
You exercise moderately (3–5 days per week)	2396 Calories/Day
You exercise heavily (6–7 days per week)	2666 Calories/Day
You exercise very heavily (i.e. 2x per day, extra heavy workouts)	2936 Calories/Day



Thermic Effect of Food

- How much energy it takes the body to break down the food



Thermic Effect of Food

- How much energy it takes to break down the food
 - **Raw food v. cooked food** **Raw**
 - **Lean protein (chicken, eggs)** **up to 30%**
 - **Complex CHO** **up to 20%**
 - **Fat, sugar** **3%**

Daily Fiber Recommendations

Years of age	Grams of Fibre Per Day	
	Male	Female
1-2	19	19
4-8	25	25
9-13	31	26
14-18	38	26
19-50	38	25
> 50	30	21

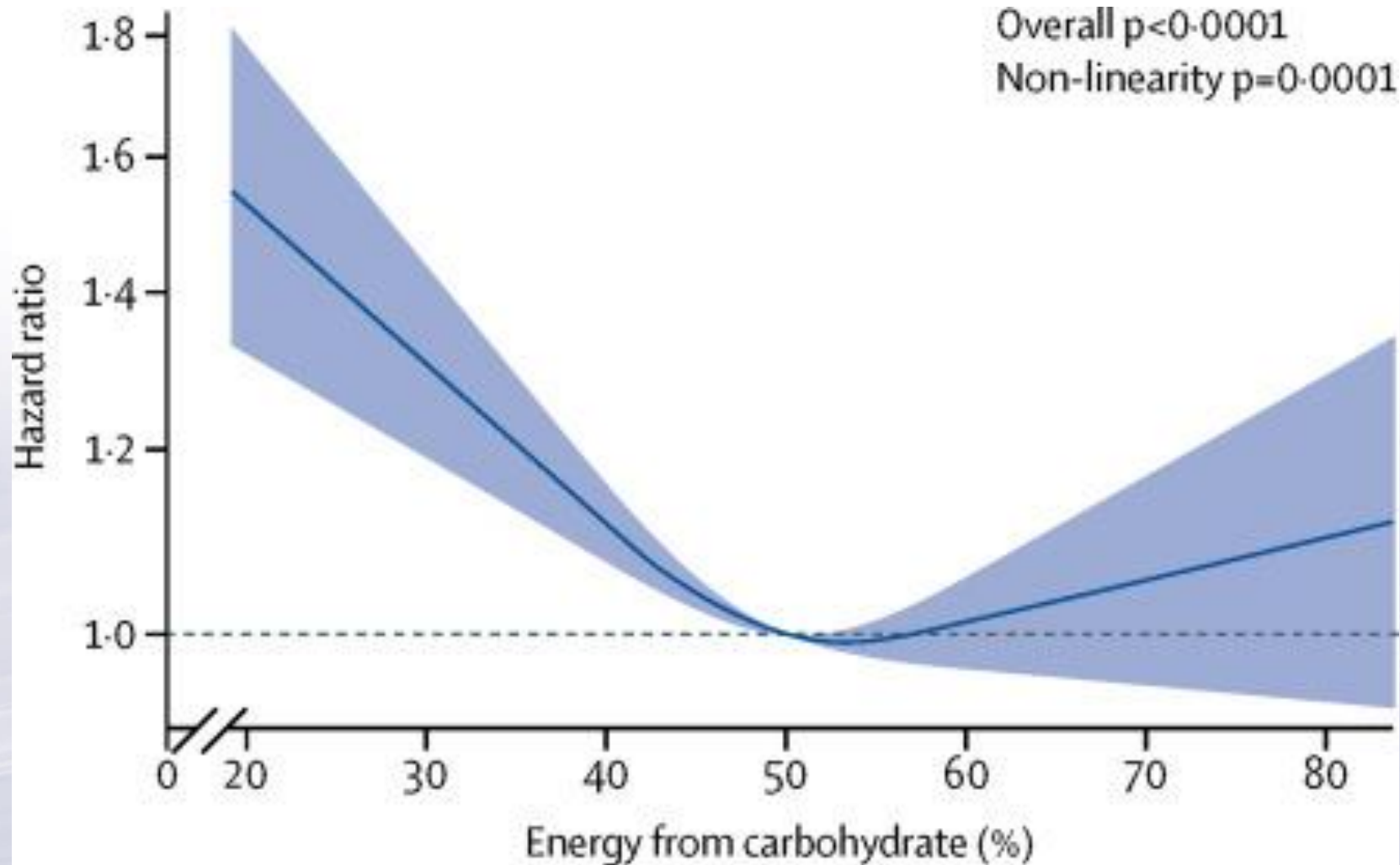
The Case for Carbs

- The Lancet [https://www.thelancet.com/article/S2468-2667\(18\)30135-X/fulltext](https://www.thelancet.com/article/S2468-2667(18)30135-X/fulltext) Vol 3, ISSUE 9, Pe419-e428, Sept 01, 2018
- Dietary **carbohydrate intake and mortality**: a prospective cohort study and meta-analysis (NIH funded)
- **15,428 adults aged 45–64 yrs,** in four US communities, who completed a dietary questionnaire in the Atherosclerosis Risk in Communities study (b/w 1987 and 1989)

The Case for Carbs

- There was a U-shaped association - **Both high and low** percentages of **carbohydrate diets** were associated with **increased mortality**.
- **50–55% energy from carbohydrate was associated with the lowest risk of mortality.**

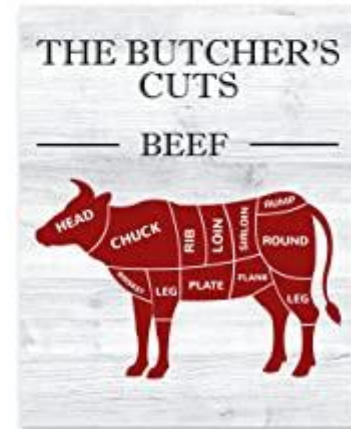
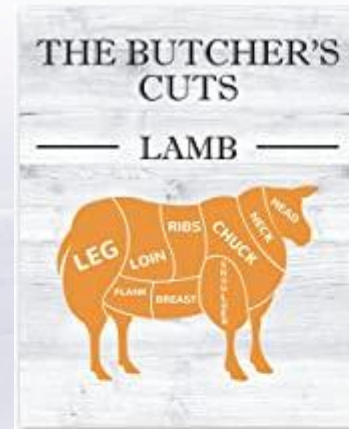
Overall $p < 0.0001$
Non-linearity $p = 0.0001$



Results are adjusted for age, sex, race, ARIC test center, total energy consumption, diabetes, cigarette smoking, physical activity, income level, and education

The Case for Carbs

- Low carbohydrate dietary patterns favoring **animal-derived protein and fat sources**, from sources such as lamb, beef, pork, and chicken, were **associated with higher mortality**.



The Case for Carbs

- Low CHO dietary patterns **favoring plant derived protein and fat intake**, from vegetables, nuts, peanut butter, and whole-grain breads, were associated with **lower mortality**



The Case for Carbs

- The Lancet (Vol 3, ISSUE 9, Pe419-e428, Sept 01, 2018)
- This suggests that the **source of food** notably modifies the association between carbohydrate intake and mortality.

DASH Diet

- Dietary Approaches to Stop Hypertension
 - <http://dashdiet.org/default.asp>
- Voted BEST DIET multiple years in a row by US News and World Report (experts)
 - Ease of following, success with weight loss
- **Is a preferred diet for ALL patients with hypertension – INCLUDING CHILDREN**

DASH Diet

- Whole food diet
 - Plant focused - fruits/vegetables
 - Nuts
 - **LOW SODIUM (< 2300 mg a day) – < 1 tsp**
 - Low fat dairy
 - Lean meat (less red meat preferred)
 - Whole grain carbohydrates

Heart Association Diet (AHA)

- A heart healthy diet for those **WITH heart disease** or **to PREVENT heart disease**
 - [http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/The-American-Heart-Associations-Diet-and-Lifestyle-Recommendations UCM_305855_Article.jsp#.Ww1Ow2fbKTM](http://www.heart.org/HEARTORG/HealthyLiving/HealthyEating/Nutrition/The-American-Heart-Associations-Diet-and-Lifestyle-Recommendations_UCM_305855_Article.jsp#.Ww1Ow2fbKTM)
- Is like the DASH Diet
 - but is **LOW in cholesterol**
- Emphasizes **NO SMOKING**



AHA Diet Recommendations

- Fruits/vegetables (>5)
- Whole grains
- Low fat dairy -1% milk or skim
- Beans
- Fish (2 servings/week).....**not fried**
- Lean meat
- Low saturated/trans fat foods
- **ZERO high sugar items – soda, sports drinks**
 - Must be < 10 cal/8 oz (crystal light)

*Mediterranean Diet

- Heart healthy diet:
 - Lowers LDL
 - Reduces heart disease
 - Reduced risk of cancer
 - Reduced risk Parkinson's and Alzheimer's disease.
 - <https://www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/in-depth/mediterranean-diet/art-20047801>

*Mediterranean Diet



- Whole food diet
 - Plant focused - fruits/vegetables
 - **Heart healthy fats** (olive oil, nuts, avocados)
 - Whole grains
 - Legumes
 - Lean proteins (fish 2 x week, **limit red meat to 1-2 x month**)
 - **ADULTS up to 1 glass of red wine (resveratrol)*

Traffic Light Diet (*WW)

5-2-1-0 AAP



5 fruit/veg

TRAFFIC LIGHT FOOD GUIDE

Your Easy Guide to Healthy Food Choices
thelunchboxclub.co.nz

GREEN GO FOR IT!

Eat these foods as part of every meal, every day! These foods offer the best balance of nutrients and energy and are higher in essential Vitamins, Minerals and Fiber

COMMON FOOD GROUPS

- Fruit & Vegetables
- Lean Meat & Fish
- Eggs, Nuts & Seeds, Beans & Lentils
- Wholegrain Bread, Cereal, Rice & Pasta
- Reduced Fat Dairy Products
- Water & Milk

EXAMPLES Low Fat Yogurt, Colby & Edam Cheese, Wholegrain Sandwich, Porridge, Natural Muesli, Chickpeas, Baked Beans, Tinned Fruit in Juice, Tinned Tuna in Water, Fresh or Frozen Fruit & Veggies, Beef, Pork or Lamb trimmed of visible fat, Skinless Chicken

VITAMINS AND MINERALS **ENERGY DENSITY** **SATURATED FAT SUGAR AND SALT**

ORANGE GO EASY!

Eat these foods with some meals, but not every meal, and definitely not every day! Too much or too often can be unhealthy. Enjoy small serving sizes.

COMMON FOOD GROUPS

- Processed Meat with reduced fat & salt
- Refined & Processed Bread & Cereal
- Full Fat Dairy Products
- Reduced fat/sugar Cakes, Muffins, Slices & Biscuits
- Reduced fat flavored Milk & Fruit Juice with no added sugar

EXAMPLES Ham, Bacon, Pastrami, Processed Breakfast Cereals, White Bread, Taco Shells, Tasty Cheese, Fruit Bread, Fruit Scones, Homemade Pancakes, Plain Sweet Biscuits, Custard

VITAMINS AND MINERALS **ENERGY DENSITY** **SATURATED FAT SUGAR AND SALT**

RED WHOA!

Before you eat, think "should I eat that?" Try to eat these foods only once a week! They are the most likely to cause health problems, especially if you eat them all the time.

COMMON FOOD GROUPS

- Deep Fried Foods & Processed Potato Dishes
- Processed Meat with high fat content
- Dairy-based Dessert Products
- Cakes, Muffins, Slices & Biscuits
- Sweet & Savory Pastry Products
- Chocolate, Confectionery & Sugary Drinks

EXAMPLES Hot Chips, Sausages, Salami, Luncheon, Pies, Hot Dogs, Chicken Nuggets, Potato Chips, Salty Savory Snacks, Chocolate Cake, Muffins, Muesli Bars, Donuts, Camembert, Fizzy Drinks

VITAMINS AND MINERALS **ENERGY DENSITY** **SATURATED FAT SUGAR AND SALT**

TIPS

- 1 More than half your daily food choices should come from Green foods.
- 2 Aim for a minimum of 3 Vegetable Servings & 2 Fruit Servings everyday.
- 3 Make Orange or Red foods healthier by adding Green foods.
- 4 Enjoy small serving sizes of Orange & Red foods.

THE LUNCH BOX CLUB

Copyright © The Lunch Box Club 2012. Endorsed by Kate Syers, Dietician (NZ Registered), 2012

The problem with liquid calories

- Purdue study (adults):
- 450 calories:
 - Jelly beans
 - Soda

The problem with liquid calories

- 450 calories:
 - Jelly beans **LESS food intake**
 - Soda **MORE food intake**

Relates to satiety signals

Juice v. Soda....



**8 oz Coke = 24 g carbohydrates
(CHO)**

(same as skim chocolate milk!!)

Juice v. Soda....



**8 oz Coke = 24 g carbohydrates
(CHO)**

(same as skim chocolate milk!!)



8 oz OJ = 26 g CHO

(more than 3 Chips A'hoy cookies...)

12 g CHO in 1 medium orange

(but has fiber → improves satiety)

Diet Recommendations

- **ZERO high sugar items**
- **< 10 calories/8 oz**
- **Such as:**
 - Water
 - “Spa water”
fruit/veggies
 - Seltzer Water



Artificial Sweeteners (NNS)

“It can be reasonably argued that certain subpopulations of children/adults might benefit from the use of NNSs.”

- <https://www.aap.org/en-us/about-the-aap/aap-press-room/Pages/American-Academy-of-Pediatrics-Looks-at-Use-of-Nonnutritive-Sweeteners-by-Children.aspx>
- **AAP Policy Statement Nov 2019**
<https://pediatrics.aappublications.org/content/144/5/e20192765>
- Obesity - lower total caloric intake
- DMI/DMII - lack of a glycemic response
- Multiple MET/CV dz RF (decr excess CHO intake)

Artificial Sweeteners (NNS)

- NNSs
 - With the exception of the use of aspartame and neotame in children with phenylketonuria..
 - **there are no absolute contraindications to NNSs use in children.**

AAP “Milk” Update ages 0-5 yrs

(September 2019)

“Plant milks”

*Few plant milks (other than fortified soy) are nutritionally equivalent to cow’s milk and are **not recommended for exclusive consumption in place of dairy or soy milk, unless medically indicated.***

Milk and “Milk” – Carbs

8 oz soda = 24 g CHO

3 Chips Ahoy! cookies = 22 g CHO

MILK	LOW FAT = 1% or skim products				
Per 8 ounce serving	Calories	Protein (g)	Carbohydrates(g)	Fat (g)	Notes:
Milk, whole (3.5%)	146	8	11.0	8	
Milk, 2%	122	8.1	11.4	4.8	
Milk, 1%	110	8.2	12.2	2.5	
1% Chocolate Milk	160	8	27	2.5	High carbohydrate
1% Strawberry Milk	170	8	30	2	High carbohydrate
Milk, fat free	85	8	11.4	0.4	
Skim Chocolate Milk	120	8	26	0.5	High carbohydrate
Skim Strawberry Milk	120	8	22	0.4	High carbohydrate
Lactaid – varies by % fat					lactose free source
Almond milk	60	1	8	3	Low calorie VERY LOW protein
Rice milk	120	0.4	24	2	VERY LOW protein HIGH carbohydrate
Soy milk	127	11	12	4.7	HIGHER protein HIGHER calcium
- Smart Balance fat free - Hannaford “Simply Skim” - Hood Simply Smart	110	10	15	1.5	HIGHER protein HIGHER calcium

Milk and “Milk” - Protein

MILK	<i>LOW FAT = 1% or skim products</i>				
Per 8 ounce serving	Calories	Protein (g)	Carbohydrates(g)	Fat (g)	Notes:
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Milk and “Milk” – Calcium

MILK	<i>LOW FAT = 1% or skim products</i>				
Per 8 ounce serving	Calories	Protein (g)	Carbohydrates(g)	Fat (g)	Notes:
Milk, whole (3.5%)	146	8	11.0	8	
Milk, 2%	122	8.1	11.4	4.8	
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Weight Loss Drugs

Threshold for approval by the FDA WAS previously **generally accepted** for *demonstrating 5% absolute weight loss.*

\$\$\$\$\$\$



Weight Loss Drugs

Often REQUIRE:

- Documentation of 6 mo of failure of diet and exercise
- Documentation of which medications they are (*or are NOT*) eligible for.
- Documentation of failure of previous meds
- Updated notes at 3-6 mos to see if they are losing weight
 - They will d/c coverage if not losing wt

Barriers to Getting Weight Loss Drugs

- Some insurances do NOT them cover AT ALL
(CMS is being lobbied now)

<https://www.fiercehealthcare.com/payers/cms-urged-change-glp-1-drug-coverage-determination#:~:text=These%20medicines%20are%20not%20covered,according%20to%20a%20press%20release>

- Co-pays can be prohibitive (hundreds of dollars)
- Prior authorizations can take 2 weeks for initiation and CONTINUATION
 - *and pts are *UPSET* when there are delays*
- Current Manufacturing issues
 - No starting doses of Saxenda or Wegovy

Weight Loss Drugs

Threshold for approval through the FDA is
**generally accepted* for proving 5% weight loss.*

Meaning a 200# patient:
could lose 10 pounds on a medication
over 24 wks to 68 wks
(current trials on meds)

Weight Loss Medications and I/DD patients

.....Unstudied

They are not included in the trials

Same as patients with SO (Super Obesity BMI ≥ 50) or SSO (Super Super Obesity BMI ≥ 60)

Weight Loss Terms

- % Weight Loss - *quoted in most studies*
 - A pt who weighs 200 pounds
 - 5% wt loss 10#
 - 10% wt loss 20#
- Relative Weight Loss
 - Is NOT absolute wt loss - *sneaky*

FDA approved WL medications

Adult v. Pediatric data is DIFFERENT

Medication	Approved age 18	Pediatric Approval	ADULT DATA
Phentermine DEA controlled substance – ISTOP	1959 ***no data	16 and older *** no data	3 mo use
Orlistat	1999	2007: 12 and older 0.55 BMI reduction at 52 wks	8# in 6 mo
Phentermine/topiramate DEA controlled substance – ISTOP	2012	7/22 16 and older 7.1% BMI reduction at 1 yr	6.7-8.9% in 1 yr

Phentermine (Ionamin, Sentis)

- **Approved 1959 with NO DATA**
- Currently approved down to age 16
- Is a DEA controlled substance – risk of addiction.
 - **Check ISTOP.....OPMC**
- Works on the brain to “increase chemicals to make you feel full”

Phentermine (Ionamin, Sentis)

- FDA approved for 90 day use
- In 2019, it was the 158th most commonly prescribed medication in the US, with more than 3 million prescriptions

<https://clinicalcalc.com/DrugStats/Top300Drugs.aspx>

Phentermine

- Not recommended for:
 - Heart disease
 - Uncontrolled HTN (MKSAP)
 - Hyperthyroid
 - Glaucoma
- Concern with anxiety and MH d/o
- Withdrawn from the market in the United Kingdom in 2000

Orlistat – approved in 2007

- 120 mg **3 x day** (OTC is 60 mg day)
- Approved for **12 yrs and older**
- Reduces the amount of fat absorbed from a meal – gives GI Sx

Orlistat – approved in 2007

- 120 mg **3 x day** (OTC is 60 mg day)
- Approved for **12 yrs and older**
- Reduces the amount of fat absorbed from a meal – gives GI Sx
- Peds 0.55 reduction in BMI
- Adults: 0-8 pound weight loss in 6 mos.
- Rare cases of liver failure
- Never approved in Europe or Canada

Qsymia – phentermine/topiramate

- Approved 7/12
- Adults data: **After one year** of treatment, patients lost an average of 6.7 to 8.9% of body weight
 - *If pt fails to reach 3% weight loss at 12 weeks, d/c med*
- Peds data (7/22 approved)
 - 7.1% reduction in BMI at 1 year

Qsymia – phentermine/topiramate

- Same risks as phentermine
- Fetal risk from topiramate



➤ Babies of pregnant mothers taking Topamax suffered birth defects at rates 11 times higher than average.

➤ Topamax taken during pregnancy has been linked to the development of oral clefts, cleft lip and cleft palate.

➤ The FDA has labeled Topamax as a Category D drug, meaning it has shown potential risks for fetal development

THL



Qsymia – phentermine/topiramate

Complicated dosing schedule

Phentermine/Topiramate ER (Qsymia™)

- Dosing**



*Should NOT be discontinued abruptly (increased risk of seizure). Taper over at least one week



Qsymia – phentermine/topiramate

- Fetal risk from topiramate – lawsuits and multiple legal websites
 - Make sure women of child-bearing age have “*appropriate*” birth control measures in place

THL

TOPAMAX LAWSUIT | TOPAMAX BIRTH DEFECTS LAWSUIT

PEOPLE EFFECTED:
Babies born to women who took Topamax while pregnant – who consequently suffered birth defects as a result of their mother's use of Topamax.

LAWSUIT INJURIES:
Oral Clefts
Cleft Palate
Cleft Lip
Other Injuries

MANUFACTURERS:
Janssen Pharmaceuticals Inc.

FDA Warning:
Issued 2011

LAWSUIT STATUS:
Accepting New Clients

any Medical Center

FDA approved WL medications

Medication	Approved age 18 ONLY	Miscellaneous:	ADULT DATA
Naltrexone/bupropion	2014	-----	3.7-8.1% at 56 wks
Plenity Capsules	2019	BMI 25-40 only	5-10% at 24 wks
Lorcaserin – 5HT2c (Belviq)		REMOVED by FDA 2/20 – tumor growth	

Contrave – naltrexone/bupropion

- Approved 2014 for adults
- Naltrexone - which is used to treat alcohol and drug dependence.
- Bupropion (depression and tobacco cessation) may make you feel less hungry or full sooner (*mechanism unknown*)
- **3.7% to 8.1%** weight loss with diet/exercise **at 56 weeks**

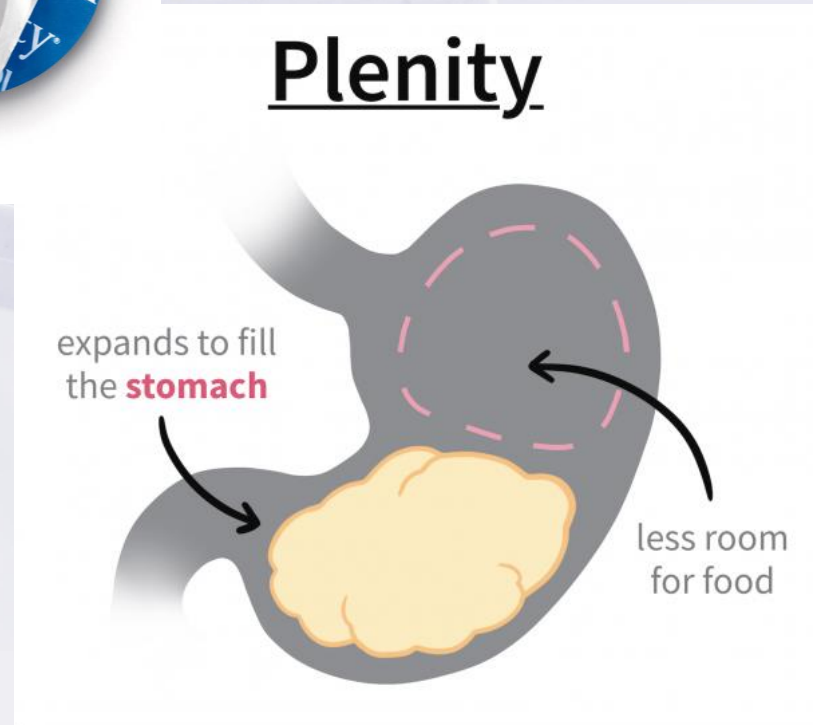
Contrave – naltrexone/bupropion

- CONTRAINDICATED
 - uncontrolled HTN, Sz d/o or a h/o anorexia or bulimia nervosa
- DO NOT use:
 - are dependent on opioid pain medications
OR
 - withdrawing from drugs or alcohol
 - are taking bupropion (Wellbutrin, Zyban)

Contrave – naltrexone/bupropion

- SERIOUS interactions “use alternative”:
 - SSRIs, SNRIs, narcotics (38 serious drug interactions)
- May need DOSE adjustments:
 - hepatic impairment, with clopidogrel
- *MAY INCREASE SUICIDAL THOUGHTS OR ACTIONS*

Plenity – approved 2019



Plenity – approved 2019

- Adults only
- BMI 25 to **40 (*so an UPPER limit*)**
- Cellulose and citric acid capsules to make you feel fuller
- 2 tabs 20 min before meals up to 2 x day with 16 oz of water
- 5-10% wt loss/**24 wks** WITH diet/exercise

Plenity – approved 2019

There is only one pharmacy that dispenses
("GoGo" pharmacy in VA)

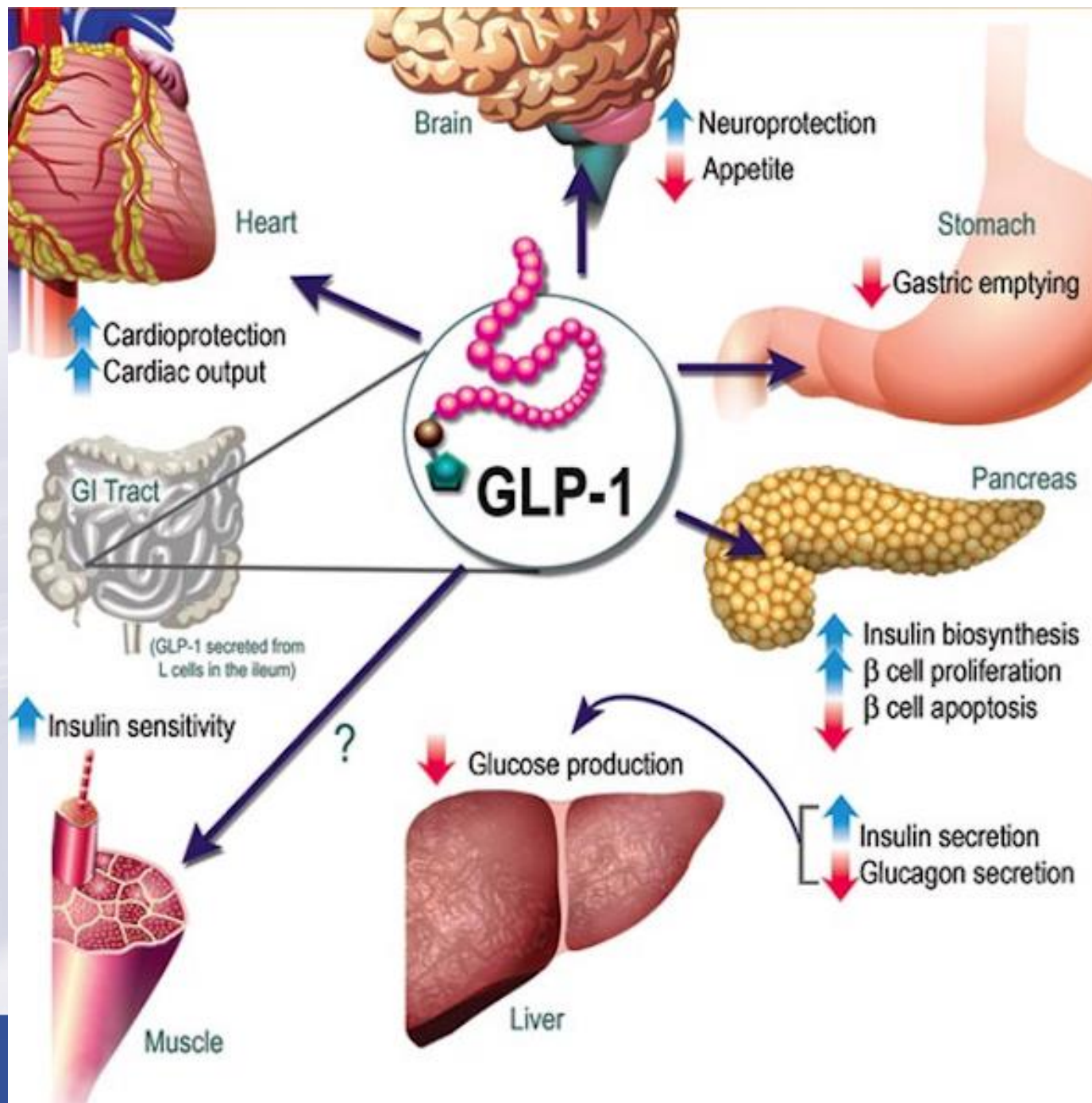
\$99/mo patient co-pay

Plenity – approved 2019

- Contraindicated
 - Pregnancy
 - esophageal anatomic abnormalities
 - problems with gastric transit or motility

GLP 1 agonists – only a few are FDA approved for weight loss

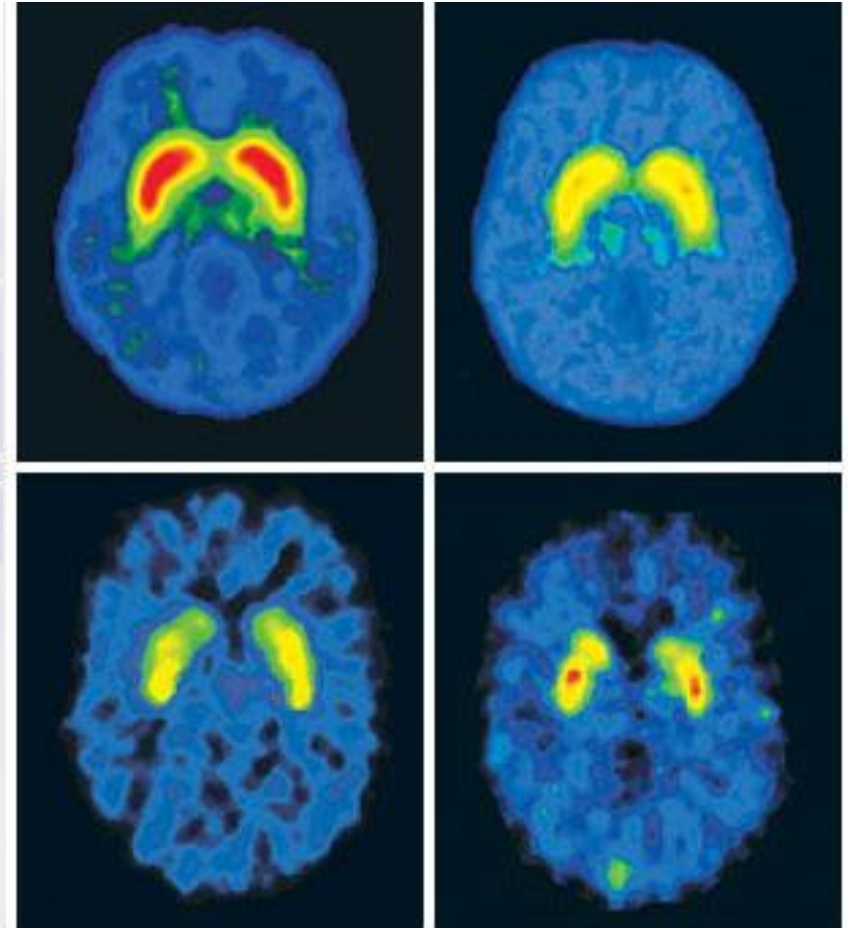
- Dulaglutide (Trulicity) (0.75-3 mg SQ weekly)
- Exenatide ER (Bydureon) (2 mg SQ weekly)
- Exenatide (Byetta) (5 mcg to 10 mcg twice daily)
- Semaglutide (Ozempic, **Wegovy**) (**SQ weekly**)
- Semaglutide (Rybelsus) (3-14 mg PO daily)
- Liraglutide (Victoza, **Saxenda**) (**SQ daily**)
- Lixisenatide (Adlyxin) (20 mcg SQ daily)



Obesity and the brain

PET Scan data

Normal	obese
Alcohol	cocaine



Obesity and the brain

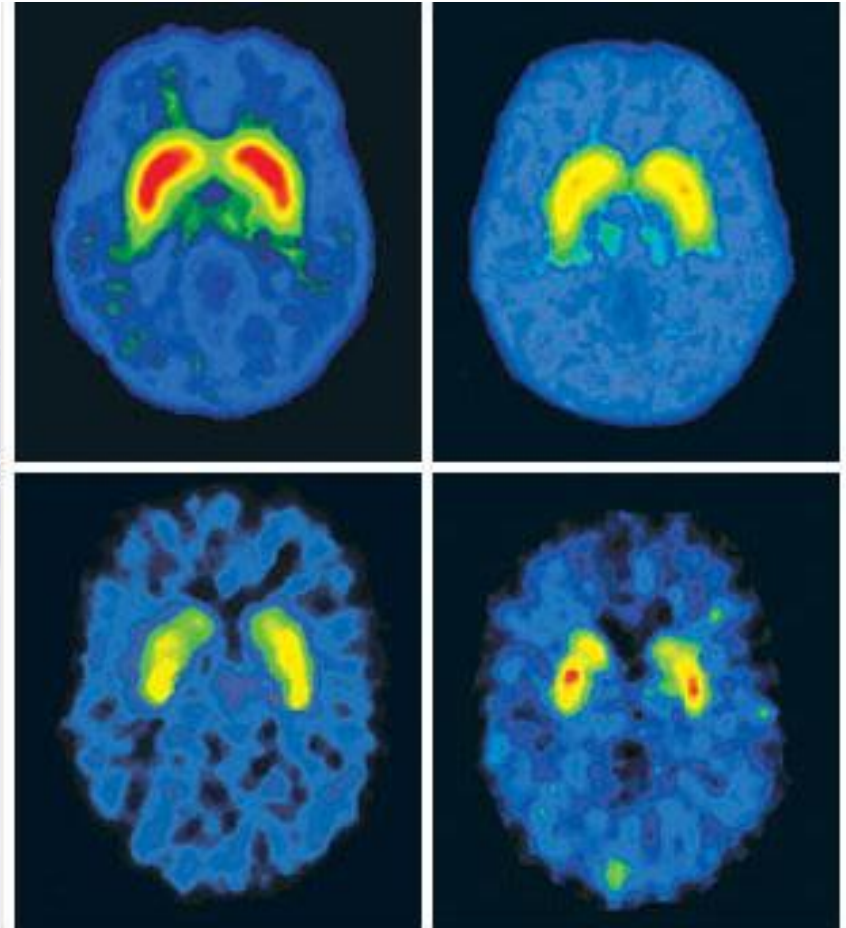
PET Scan data

Normal obese
Alcohol cocaine

Red = dopamine

- plays a major role in the motivational component of reward-motivated behavior.

See loss in addiction



What Patients Say about being on GLP 1 medications

- Less cravings
- Decreased snacking
- Less “FOOD NOISE”
- Eating less, get fuller earlier
- Stay fuller longer

Other GLP 1 benefit/risks

- Early reports that GLP 1s reduce ETOH/opioid use (being studied)
 - <https://pubmed.ncbi.nlm.nih.gov/34532853/>
 - <https://insight.jci.org/articles/view/170671>
- Newer reports of worsening mood 8/23
 - *Not reported with DM treatment and GLP 1s has been demonstrated to be PROTECTIVE for depression*
 - <https://www.healthline.com/health-news/ozempic-wegovy-suicidal-thoughts>

Class Action Lawsuits cropping up 2023

- Gastroparesis (....this is how it works)
- Ileus/bowel obstruction

<https://www.drugwatch.com/legal/ozempic-lawsuit/>

<https://www.biospace.com/article/novo-nordisk-eli-lilly-sued-over-stomach-paralysis-allegations-regarding-glp-1-drugs/>

FDA approved WL medications

Adult v. Pediatric data is DIFFERENT

Medication	Approved age 18	PEDIATRIC DATA	ADULT DATA
Saxenda Liraglutide – SC daily	2015	12/20: 12 and older 2.6% wt loss at 56 weeks	52% lost > 5% at 56 wks (48% did not lose 5% wt)
Wegovy Semaglutide –SC weekly	2021	12/22: 12 and older Same as adult	Up to 15% over 68 wks

Diabetes Doses are not the same as Weight Loss Doses

Names are different (\$\$ insurance)

Diabetes Name	Weight Loss Drug Name	Max Diabetes Dose	Max Weight Loss Dose
Liraglutide GLP-1 agonist (Victoza)	Name: Saxenda (liraglutide)	Daily SQ 1.8 mg	Daily 3 mg
Semaglutide GLP-1 agonist (Ozempic)	Name: Wegovy (semaglutide)	Weekly SQ 2.0 mg	Weekly 2.4 mg
Tirzepatide GIP/GLP-1 agonist (Mounjaro)	NOT FDA APPROVED (Pending)	Weekly 15 mg	

Liraglutide (Saxenda) – Daily SQ injection

- Approved in ADULTS 2015
- *Approved in PEDS age ≥ 12 yrs Dec 2020*
- GLP-1 agonist originally approved for DMII
 - Delays gastric emptying
 - *“Exact mechanism for reducing appetite is unknown”*

Liraglutide (Saxenda) – Daily SQ injection

- 3 mg SQ injection DAILY
 - DMII dose is much lower – 1.2 mg



Liraglutide (Saxenda)

Adults - ***After 56-weeks:*** (if weighs 200#)

- 5% \geq weight loss: 34% pts (10#+)
- 10% \geq weight loss: 15% pts (20#+)
- 20% \geq weight loss: 3% pts (40#+)
- *34+15+3 = 52% of the patients lost weight*

48% did not achieve even 5% wt loss

Liraglutide (Saxenda)

PEDS 12 and older:

- If used for **56 weeks as a DAILY shot**, the child can lose up to 2.6% of weight
–**SO WHY was it approved????**

Liraglutide (Saxenda)

PEDS:

(if weighs 200#)

- If used for 56 weeks, child can lose up to 2.6% of weight (5 pounds)

Liraglutide (Saxenda)

PEDS:

(if weighs 200#)

- If used for 56 weeks, child can lose up to 2.6% of weight (5 pounds)
- The control group GAINED 2.5% (no med)

SO....

this was a RELATIVE \geq 5% weight loss.

Liraglutide (Saxenda)

- CONTRAINDICATED WITH
 - Other GLP 1 agonists
 - Insulin
 - FHx medullary carcinoma/MEN II
- Risk of pancreatitis and cholelithiasis

Semaglutide (Wegovy)

- Adults approved June 2021
- Peds approved 12 and older June 2022
- 1 x week SQ injection
- Up to 15% weight loss **over 68 weeks**
- \$\$\$\$ - is > \$1000 a month
 - What if people need it *INDEFINITELY?*
- SE/risk similar to liraglutide

Semaglutide (Wegovy)

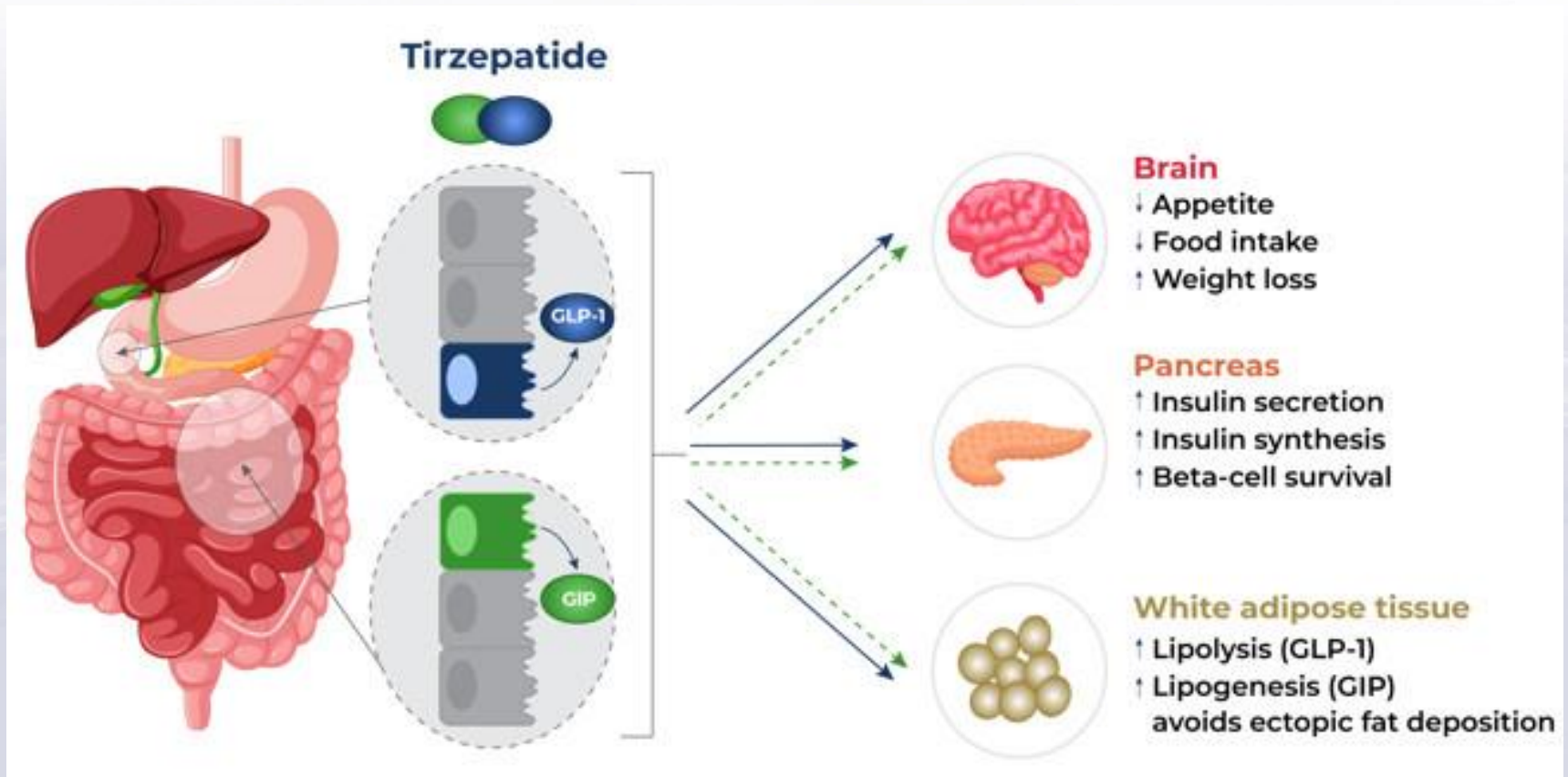


Tirzepatide GIP/GLP 1 agonist (Mounjaro)

- Approved May 2022
- First in Class
- Once-weekly GIP (glucose-dependent insulinotropic polypeptide) and GLP-1 (glucagon-like peptide-1) receptor agonist indicated **as an adjunct to diet and exercise to improve glycemic control in adults with DMII**

<https://www.cell.com/action/showPdf?pii=S1043-2760%2820%2930048-5>

Tirzepatide (Mounjaro)



Tirzepatide (Mounjaro)

- NEJM July 2022:

<https://www.nejm.org/doi/full/10.1056/NEJMoa2206038>

- Weekly SQ injections
- In this **72-week trial (1.4 years):**

Dose	% wt loss	D/C rates
5 mg	15%	4.3%
10 mg	19.5%	7.1%
15 mg	20.9%	6.2%

Tirzepatide (Mounjaro)

IT IS NOT FDA APPROVED FOR WEIGHT LOSS

*– BUT... there are websites to pay out of pocket
Retail price set at about \$12,666 per year*

April 2023: FDA is “fast tracking” the med for approval for weight loss

Lisdexamfetamine dimesylate (Vyvanse)

- Approved January 30, 2015
- Oral CNS stimulant
- The first medication approved by the FDA for the treatment of **ADULTS** with **moderate to severe binge-eating disorder**.
- 30 to 50 mg po daily

IT IS NOT APPROVED FOR WEIGHT LOSS

PULLED OFF THE MARKET

- Lorcaserin (Belviq) –
– 5HT_{2c} agonist

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 - FAILED FDA approval in 2009 for “tumor growth”

PULLED OFF THE MARKET

- Lorcaserin (Belviq) –
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 - FAILED FDA approval in 2009 for “tumor growth”
 - Got approval in 2012
 - Never approved in EU or Canada

<https://finance.yahoo.com/news/second-time-lucky-arenas-belviq-133017695.html>

PULLED OFF THE MARKET

- Lorcaserin (Belviq) –
 - 5HT2c agonist
 - FAILED FDA approval in 2009 for “tumor growth”
 - Got approval in 2012
 - Never approved in EU or Canada
 - **Removed 2/20 for incr risk of cancer**

<https://www.fda.gov/drugs/fda-drug-safety-podcasts/fda-requests-withdrawal-weight-loss-drug-belviq-belviq-xr-lorcaserin-market>

PULLED OFF THE MARKET

- Sibutramine (Meridia) (down to age 16)
 - Approved Nov 1997
 - Never approved Europe or Canada
 - **Removed US in 2010 for MI and CVA**
 - *Still found in OTC supplements...*

<https://www.fda.gov/drugs/drug-safety-and-availability/fda-drug-safety-communication-fda-recommends-against-continued-use-meridia-sibutramine>

**STRONG recommendation to recommend
AGAINST OTC weight loss supplements**

PULLED OFF THE MARKET

- Dexfenfluramine (Redux)
 - Taken off market 1997
 - Serotonergic anorectic drug: it reduces appetite by increasing the amount of extracellular serotonin in the brain.
 - It is the **d-enantiomer of fenfluramine** and is structurally similar to amphetamine, but lacks any psychologically stimulating effects.

PULLED OFF THE MARKET

- Fenfluramine (Pondimin)
 - US approved 1973 (France 1963)
 - Amphetamine derivative
 - Sympathomimetic stimulant with appetite-suppressant property
 - Modulates serotonin transporter function. Serotonin regulates mood and appetite, increased serotonin level results in a feeling of fullness and loss of appetite.

<https://pubchem.ncbi.nlm.nih.gov/compound/Fenfluramine>

PULLED OFF THE MARKET

- FenPhen - Fenfluramine/phentermine
 - THE FDA NEVER APPROVED THEM FOR USE TOGETHER
- Fenfluramine was taken off the market February 1997
 - Fatal pulmonary HTN
 - Valvular heart disease
 - Cardiac fibrosis

PULLED OFF THE MARKET

- FenPhen –
- April 2005 - > 50,000 liability lawsuits filed
- Estimates of total liability ran as high as \$14 billion. As of February 2005, Wyeth was offering settlements of \$5,000 to \$200,000
- Wyeth set aside \$21.1 billion (U.S.) to cover the cost of the lawsuits

<https://www.pbs.org/wgbh/pages/frontline/shows/prescription/hazard/fenphen.html>

PULLED OFF THE MARKET

- Fenfluramine was taken off the market February 1997
 - Fatal pulmonary HTN
 - Valvular heart disease
 - Cardiac fibrosis
- June 2020 - *RE-APPROVED by FDA for Dravet Syndrome as orphan drug designation (Fintepla)*

National Heart Lung and Blood Institute



OBESITY HAPPENS
ONE POUND AT A TIME.
SO DOES PREVENTING IT.

[Learn more »](#)

Questions?

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