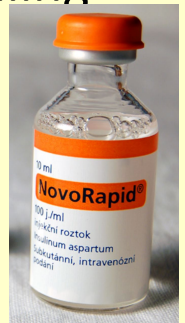


# DYSEVOLUTION

failure to treat the root causes of a mismatch disease often provokes a pernicious feedback loop allowing the disease to persist or intensify

- Form of cultural evolution that passes on behaviors and environments that promote mismatch diseases. Eating sugar increases cavities, treat with fillings, so the eating of sugar is never selected out but is perpetuated unchecked. Filling a cavity does not treat the underlying cause.
- “palliative care”: relieves the symptoms of a disease or condition without dealing with the underlying cause. *Oxford English Dictionary* original.
- Increase my insulin dose so I can eat more cake and ice cream.
- Increase my BP meds instead of losing weight and exercising.
- Increasing doses of statins instead of changing diet and exercise. CABG
- We become so adept at treating the symptoms of a mismatch disease that we reduce the urgency of treating its causes. favors PROCRASTINATION



Liabeva, DE. The Story of The Human Body. 2013. p 176 -177, 208

# Systems biology approach: sugar is not just destroying our teeth.

- Endothelial damage affects vascular health
- Hypertriglyceridemia and Hypercholesterolemia
- Kidney Damage
- Diabetes stress the beta cells and the insulin receptor sensitivity
- Polycystic Ovarian Syndrome
- Low testosterone
- Neurotoxin peripherally
- Neurotoxin centrally ( Alzheimers = Type III Diabetes)
- Stimulates growth of cancer
- Inflammation
- Osteoporosis
- Joint Pain
- Autoimmune disease
- Bacterial and Yeast overgrowth

**VASCULAR**

**ENDOCRINE**

**NEUROLOGICAL**

**IMMUNE**

**MUSCULOSKELETAL**

**GUT**



**FUNCTIONAL  
CONNECTIONS**

**ENDOCRINE**

**IMMUNE**

**NEUROLOGICAL**

**GUT**

**VASCULAR**

**MUSCULOSKELETAL**

# Arguments against Evolutionary Medicine

- Medical research: diseases of elderly, infectious, transplant, and traumatic injuries
- Genetic predispositions: tailor therapies, identify unique disease susceptibilities
- Technology: from advances in early detection to robotic surgery

**DO NOT IGNORE THE FOUNDATION!**

Cultural Evolution is Rapid and Powerful: now overwhelming natural selection

- over clean, over sat, over stressed, over isolated socially, over medicated
- people with unfit lives are still reproductively successful
- stop smoking campaigns
- meditation, yoga, heart rate variability, sleep apps
- organic, “farm to table”, “whole 30”
- actively adding movement

Decrease use of antibiotics, decrease the use of opiates

Evol Med: may unlock secrets of cancer, infection and aging

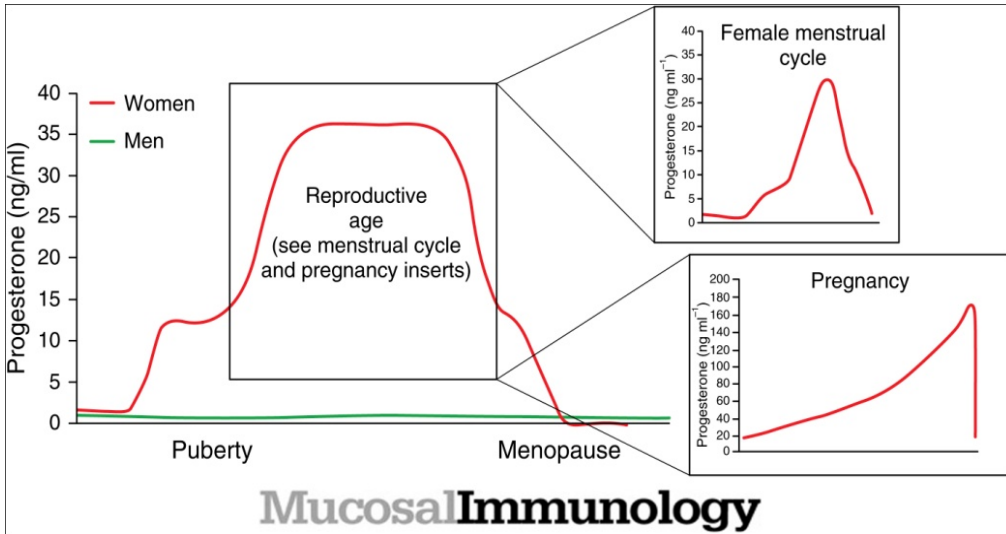


# Key Behaviors

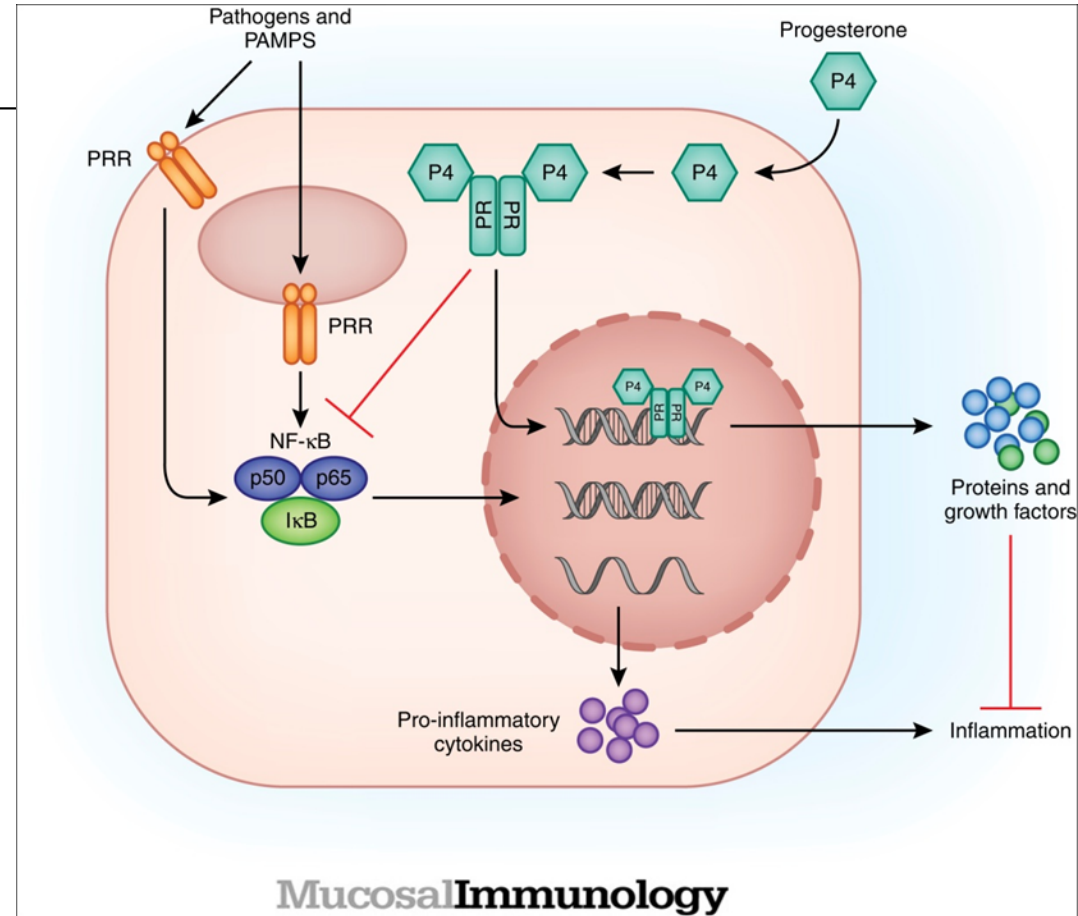
- High insulin demand food led to increased fat deposition.
- Population compression led to transmission of infectious disease.
- Cytokine mediated sickness behavior likely evolved to limit the spread of communicable diseases
- Stress reduction: current HG work and then rest. Their workday is shorter.
- Moderate exercise is safer and more beneficial than excessive exercise.
- Exercise along with social or spiritual connection provides synergistic benefits.
- Studies of healthy close relationships increase progesterone:
  - Progesterone metabolite allopregnanolone binds GABA receptor resulting in calm.
  - Progesterone also decreases apoptosis of brain cells
  - Progesterone balances effects of excess estrogen by down regulating receptors
  - Decreases inflammation and promotes repair of mucosal surfaces

Samuel, T et al. *Prog Neurobiol.* 2014 Feb; 113:6-39.  
Hall, OJ et al. *Mucosal Immunology* (2017) **10**, 1097-1107.

# Mucosal Immunology

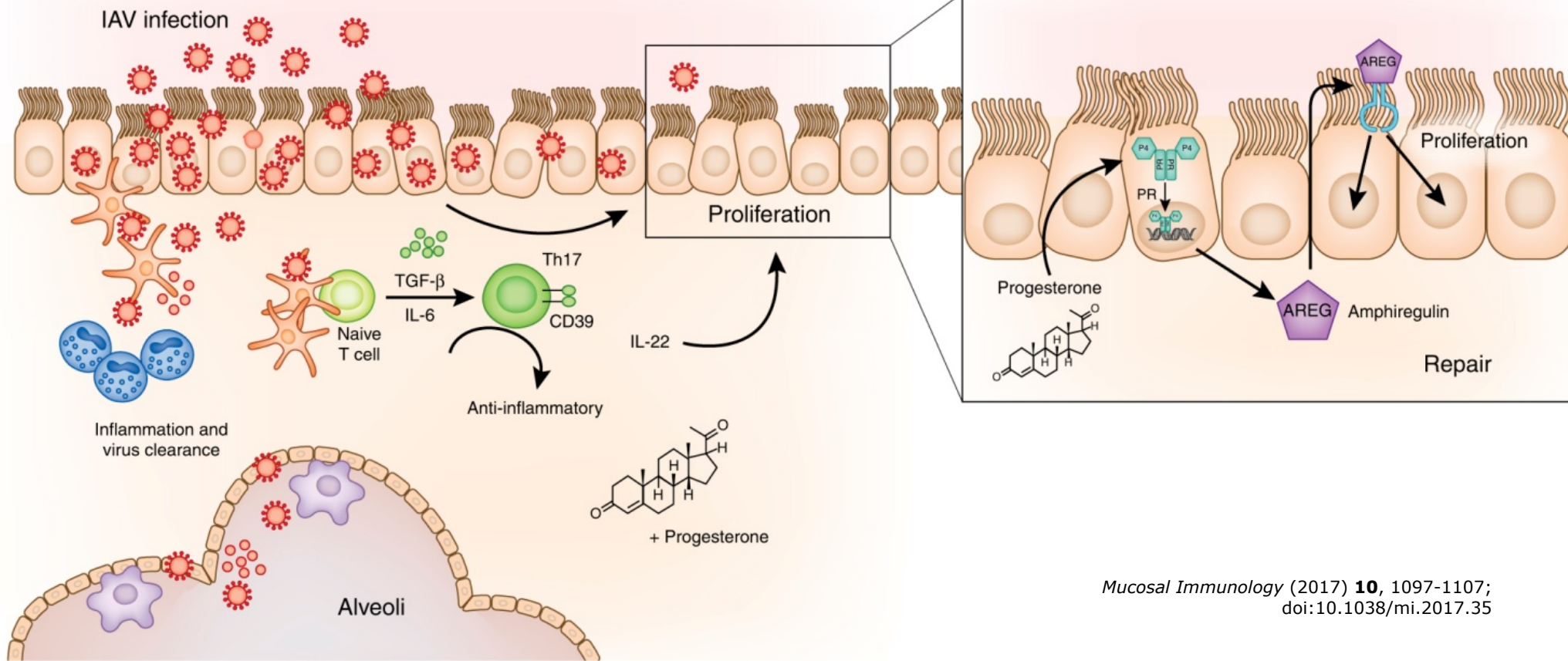


**P4** is natural progesterone



*Mucosal Immunology* (2017) **10**, 1097-1107; doi:10.1038/mi.2017.35

# Mucosal Immunology



*Mucosal Immunology* (2017) **10**, 1097-1107;  
doi:10.1038/mi.2017.35

“If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health”. - Hippocrates

## COMMON THEMES

Connection to and cooperation with others (Sociability)

Address the root cause, avoiding procrastination

Variety confers stability

Exercise regularly; we were built for it

Moderation in energy expenditure (rest) and consumption

Avoid others when you (or they) are sick

Nutrition and gut health relate to brain health

CAVEMAN

SAVEEMAN



# What are mismatch diseases?

Diseases that are more common and/or severe because the body is inadequately adapted to novel environmental conditions

“When we changed the world to suit us we were no longer suited to the world.”

>70% of diseases that we treat are mismatch and could be mitigated or prevented

“Illnesses do not come out of the blue. They are developed from small daily sins against Nature. When enough sins have accumulated, illness will suddenly appear.”

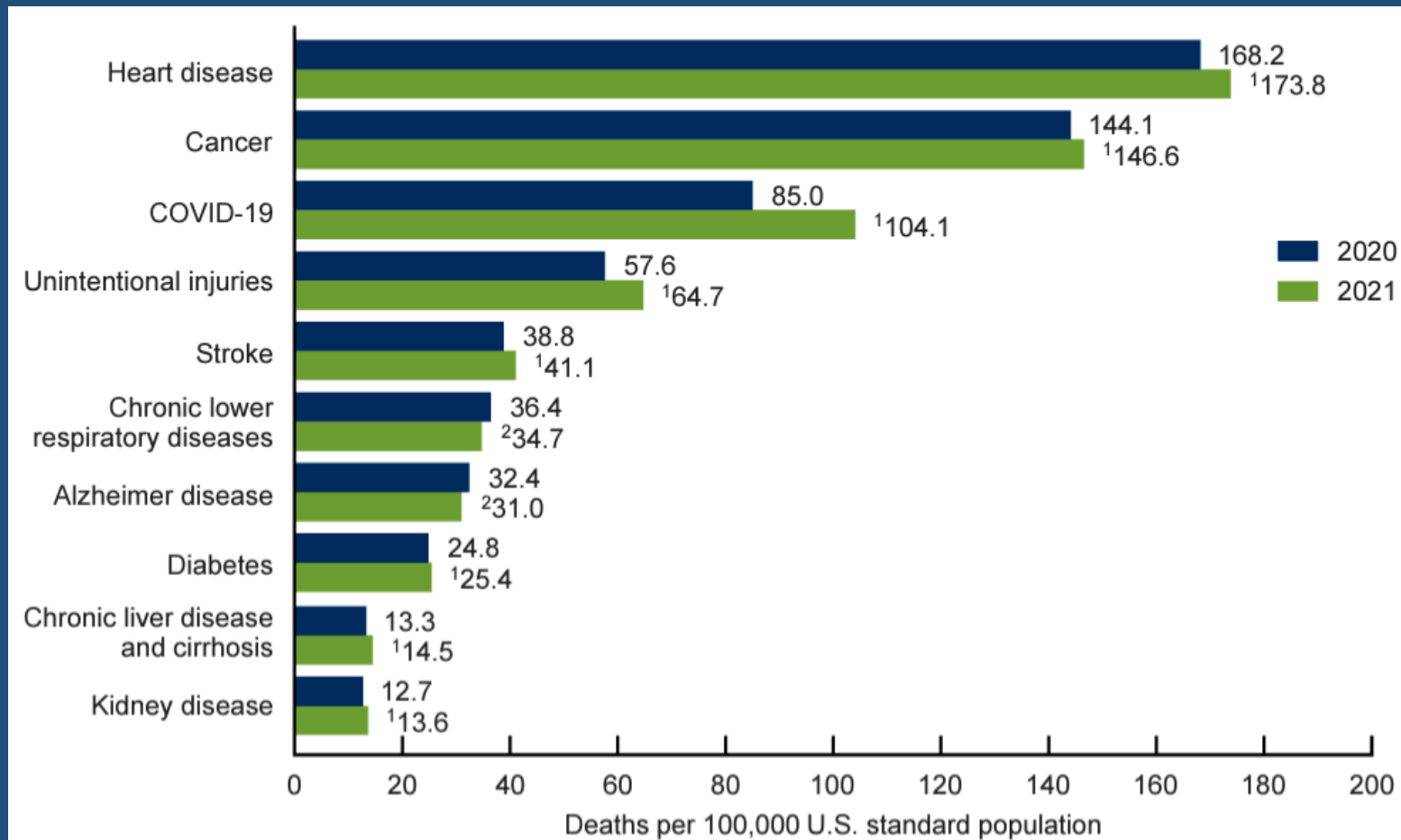
- Hippocrates

# Hypothesized Noninfectious MISMATCH DISEASES

- Acid Reflux
- Acne
- **Alzheimer's Disease**
- Anxiety
- Asthma
- Athlete's foot
- ADHD
- Bunions
- **Cancers (some)**
- **Cardiovascular Disease**
- Carpal Tunnel Syndrome
- Cavities
- Chronic Fatigue
- Cirrhosis
- Constipation
- Crohn's Disease
- **Depression**
- **Diabetes II**
- Diaper rash
- Eating Disorders
- Emphysema
- Endometriosis
- Fatty Liver
- Fibromyalgia
- Flat feet
- Glaucoma
- Goiter
- Gout
- Hammertoes
- Hemorrhoids
- Hypertension
- Impacted Wisdom Teeth
- Insomnia
- IBS
- Lactose Intolerance
- Lower Back Pain
- Malocclusion
- Metabolic Syndrome
- Multiple Sclerosis
- Myopia
- Obsessive Compulsive Disorder
- Obstructive Sleep Apnea
- Osteoporosis
- Plantar Fasciitis
- Polycystic Ovarian Syndrome
- Preeclampsia
- Rickets
- Scurvy
- SIBO
- Stomach Ulcers

Lieberman, D.E. (2013). *The Story of the Human Body*. New York: Vintage Books

# Leading Causes of Death in US



in 2021. Causes of death are ranked according to number of deaths. Rankings for 2020 data are not shown. Data table for Figure 4 includes the number of deaths for leading causes and the percentage of total deaths. Access data table for Figure 4 at: <https://www.cdc.gov/nchs/data/databriefs/db456-tables.pdf#4>. SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

# CARDIOVASCULAR and CEREBROVASCULAR DISEASES

- Consumption of seeds & nuts
- Animal meat free range, not grain fed
- High Omega 3 fats, low Omega 6
- High Fiber, Low insulin demand
- Episodes of fasting: limits excess insulin (damages the endothelium)
- Adapt our environment to suit our genes
- Stress reduction
- Restorative Sleep
- Low oxidative stressors (mercury, iron)
- Maintain Oral and Gut health
- Regular moderate exercise
- Supportive, forgiving relationships



# CANCER second leading cause of death

- Elimination of Toxins in our environment.
- 35% of cancer is attributed to **diet/nutrition**. 2<sup>nd</sup> most important determinant, trailing behind smoking. Dwarfing every other risk factor!
- Avoid diseases of hyperinsulinemia: obesity and type II DM.
- High Insulin levels are associated with a poor prognosis.
- Of the overweight, intentional weight loss can decrease cancer death 40-50%
- In Europe and N America 20% of cancers are directly related to obesity.

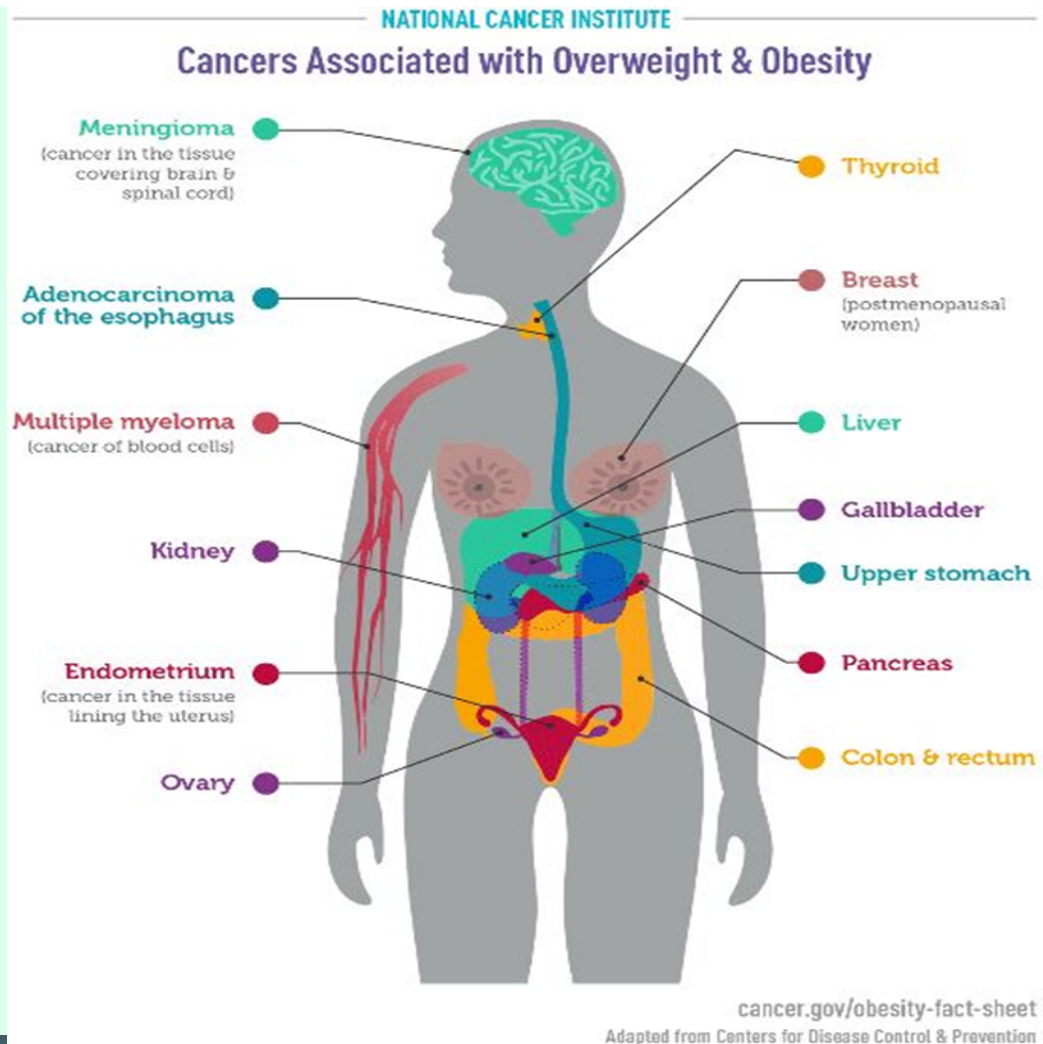


Fung, J (2020). *The Cancer Code*. New York: HarperCollins

# OBESITY

- Cancer
- Type II Diabetes
- Cardiovascular Disease
  - Hyperlipidemia
  - Coronary, Peripheral, Cerebral
  - Hypertension
  - Congestive Heart Failure
- Inflammation
- Obstructive Sleep Apnea
- Asthma
- Gallbladder Disease
- Osteoarthritis
- COVID vulnerabilities

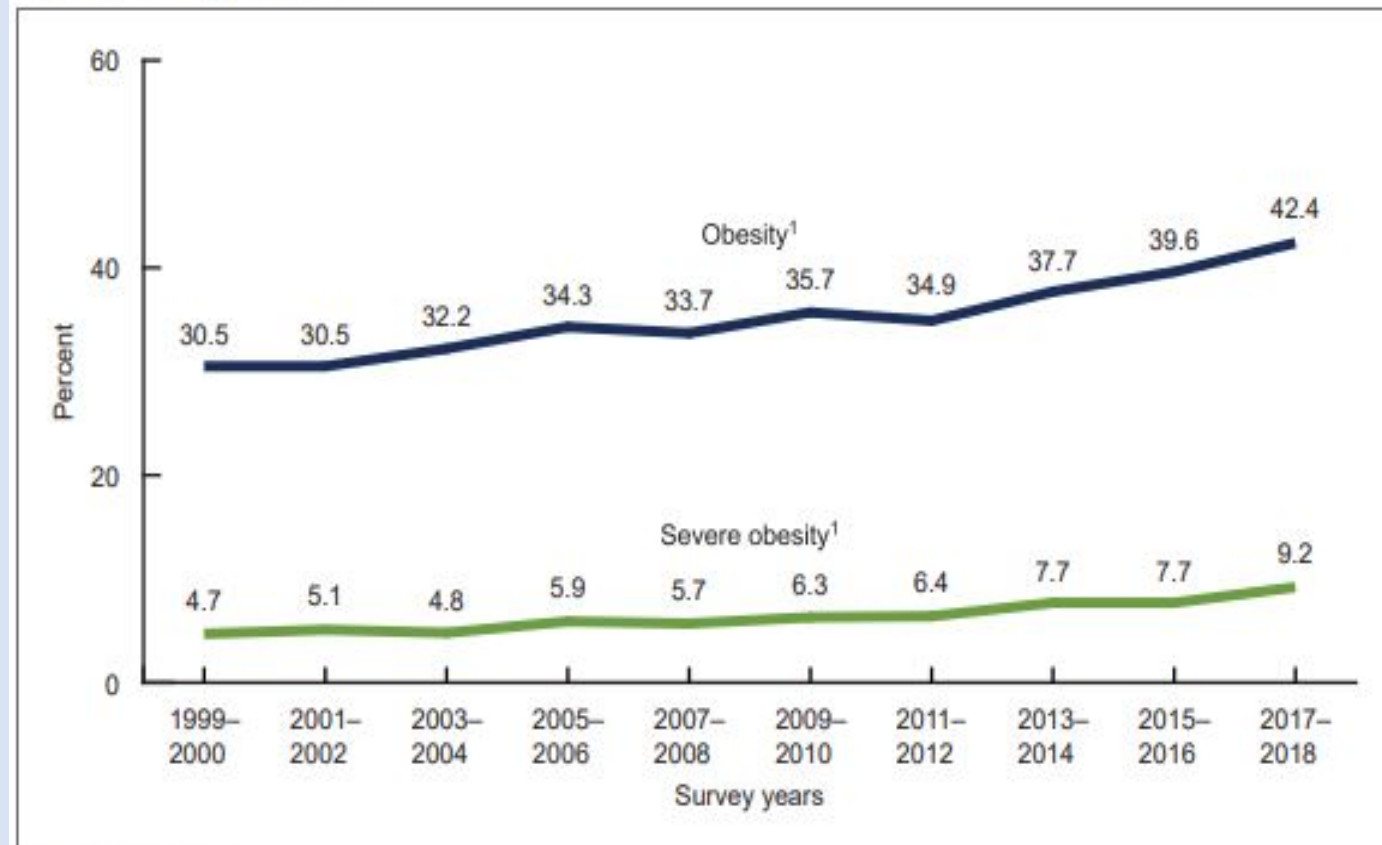
Guh DP, et al *BMC Public Health*. 2009 Mar 25; 9:88.



# OBESITY

- designed to store fat
- fat reproductive success
- resistance to famine
- What if we returned to the same behaviors?
- Intermittent fasting
- Whole foods, mostly above ground
- Minimize high insulin foods
- Daily moderate movement
- Sleep adequately
- Social connection: get your Dopamine from others not food, drugs

Figure 4. Trends in age-adjusted obesity and severe obesity prevalence among adults aged 20 and over: United States, 1999–2000 through 2017–2018



<sup>1</sup>Significant linear trend.

NOTES: Estimates 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. Access data table for Figure 4 at: [https://www.cdc.gov/nchs/data/databriefs/db360\\_tables-508.pdf#4](https://www.cdc.gov/nchs/data/databriefs/db360_tables-508.pdf#4).

SOURCE: NCHS, National Health and Nutrition Examination Survey, 1999–2018.

# POP QUIZ

What is the only type of sugar that is actually good for you?

Kissing releases dopamine, oxytocin, and serotonin.

Which burns more calories per minute, kissing or walking?

Which primate is known to kiss like humans?

“Kissing bench”  
Round Tower in Copenhagen

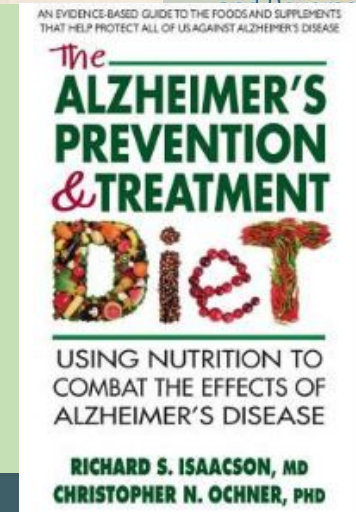
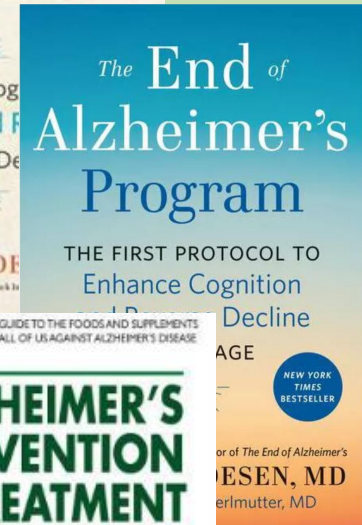
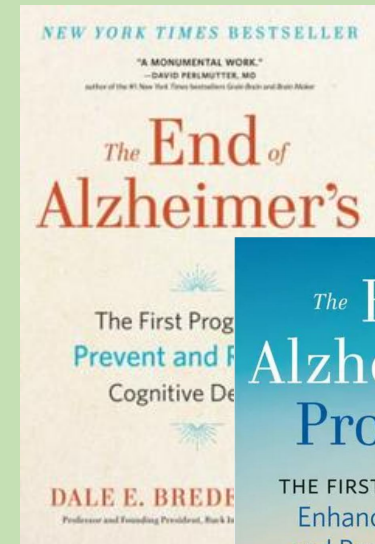
*Kyssebenken*





# NEURODEGENERATIVE DISEASES

- Alzheimer's is the 6<sup>th</sup> leading cause of death, two or more victims
- Dale Bredesen details 36 imbalances associated with cognitive impact
  - Most are reversible and can be treated
- Richard Isaacson, MD began prevention clinics for Alzheimers disease
- "Type III Diabetes": strong correlation with elevated blood sugar
- Lack of sleep increases Alzheimer's Disease and decreases cognitive function
- Exercise increases BDNF. Theory of Hunters and Gatherers combining aerobic exercise with problem solving.
- Meditation, stress reduction.



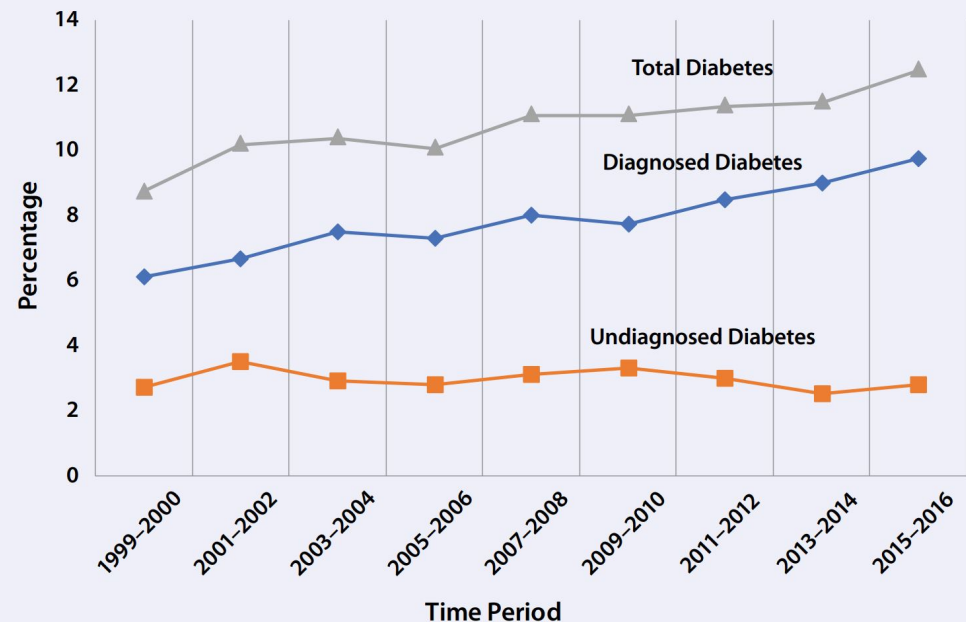
# Type II DIABETES

1 out of 10 have diabetes

1 out of 3 Americans is prediabetic

- Fasting as described in Jason Fung's *The Diabetes Code*.
- An ancient mutation in apes allows humans to turn fructose into fat.
- Move back to whole foods, high fiber, seasonal foods, fruits. Most of our history on earth we ate minimal starch, sugar and grains.
- Improve the gut microbiome
- Limit chemicals that act as endocrine disruptors.
- Adequate sleep improves weight loss
- Improving insulin sensitivity through exercise and regular movement
- Addressing food addiction. Dopamine. Processed carbs = consumption without brakes

Figure 2. Trends in Prevalence of Diagnosed Diabetes, Undiagnosed Diabetes, and Total Diabetes Among Adults Aged 18 Years or Older, United States, 1999–2016

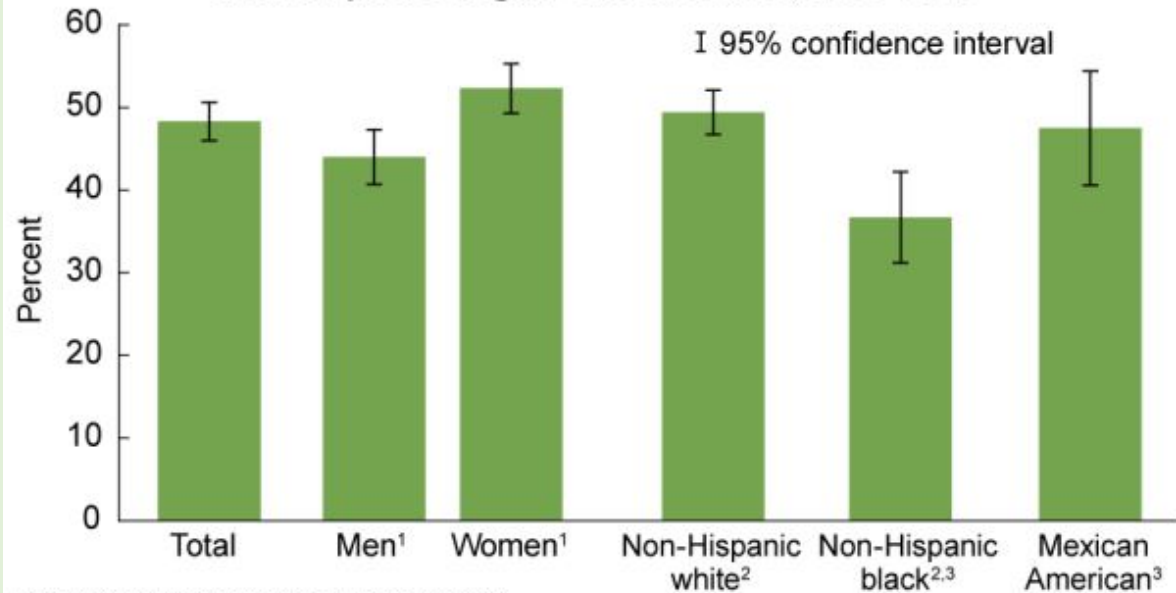


Notes: Percentages are age-adjusted to the 2000 US standard population. Diagnosed diabetes was based on self-report. Undiagnosed diabetes was based on fasting plasma glucose and A1C levels among people self-reporting no diabetes. Figure adapted from CDC's *National Diabetes Statistics Report 2020*.

# OSTEOPOROSIS

- Absorption of all essential nutrients and **gut** transformation of K1 → to K2
- Optimize the hormones that build bone and maintain bone strength
- Impact of lack of exercise
- Improve, train and facilitate balance. Avoid the trappings of modern life that contribute to falls.
- Avoid consumption and exposure to chemicals or drugs that inhibit bone growth including sugar: decreases Vit D activation

**Figure 2. Age-adjusted percentage of adults aged 65 and over with low bone mass at the femur neck or lumbar spine, by sex and race and Hispanic origin: United States, 2005–2010**



<sup>1</sup>Significant difference between men and women, ( $p < 0.05$ ).

<sup>2</sup>Significant difference between non-Hispanic white and non-Hispanic black ( $p < 0.05$ ).

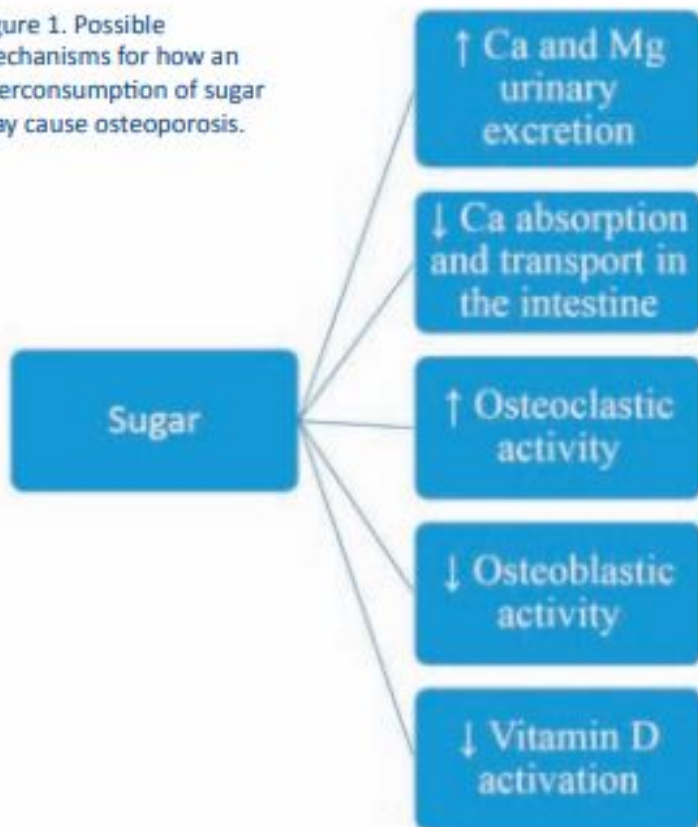
<sup>3</sup>Significant difference between non-Hispanic black and Mexican American, ( $p < 0.05$ ).

NOTES: Age-adjusted by the direct method to the year 2000 Census Bureau estimates using age groups 65-79 and 80 and over. World Health Organization diagnostic criteria were used to define low bone mass as a bone mineral density (BMD) value at the femur neck or lumbar spine that falls between 1.0 and 2.5 standard deviation units below the mean BMD for young non-Hispanic white females. BMD at the femur neck and lumbar spine was measured using dual-energy x-ray absorptiometry (DXA).

SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2005–2010.

# Modern Day Saboteurs of Bone Density

Figure 1. Possible mechanisms for how an overconsumption of sugar may cause osteoporosis.



Malabsorption

Mineral deficiencies in food

Sex hormone deficiency

Thyroid disorders, autoimmunity

Medications that rob nutrients

Overuse of steroids

Excessive EtOH and Coffee

Lack of exercise

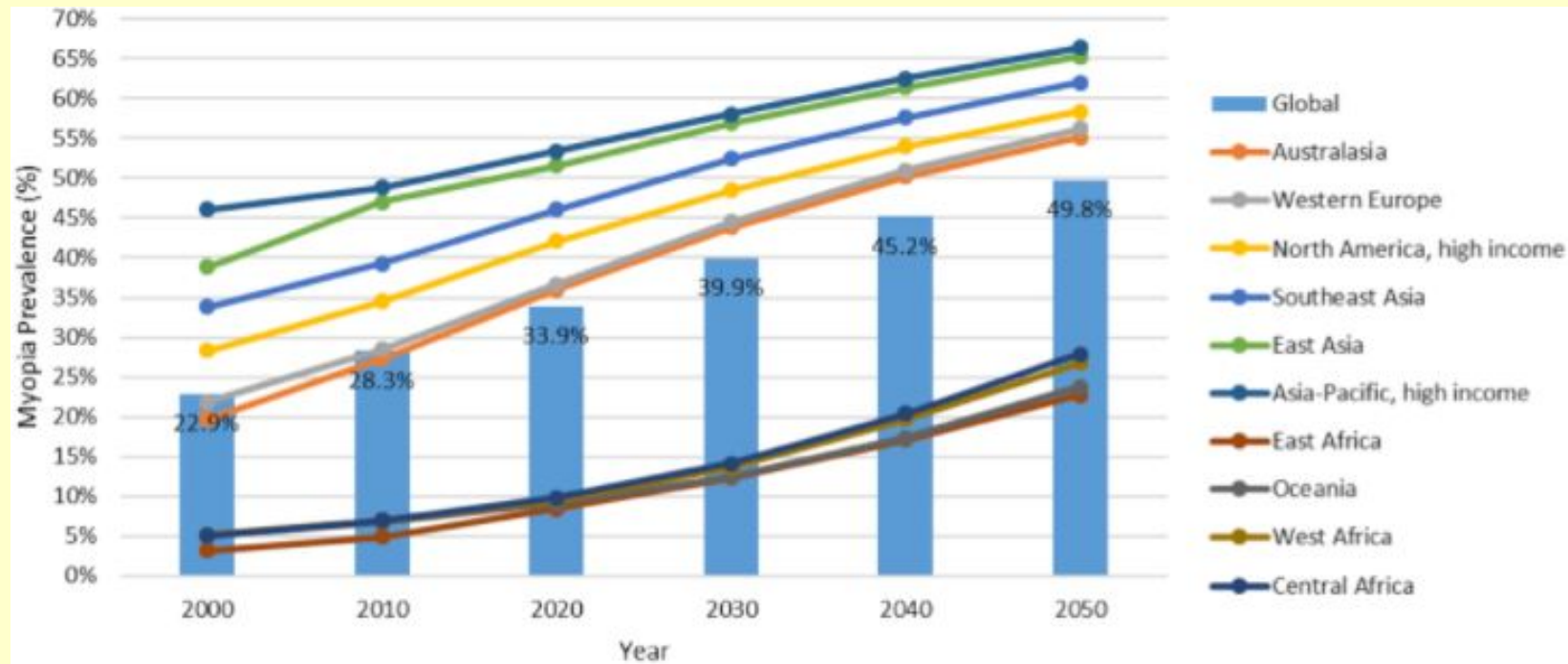
Neurodegenerative processes that impact balance

DiNicolaantonio, JJ et al. *Mo Med* 2018 May-Jun; 115(3): 247 -252

Persistent near focus elongates the eye, increasing pressure and distorting the eyeball. Predisposing to other eye diseases.

Use of eyeglasses: **dysevolution** the symptoms resolve while worsening distant vision long term.

# MYOPIA



Holden BA, et al. (2016). Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. *Ophthalmology*; 123(5):1036-42.

## LESSONS LEARNED

CAVEMAN  
SAVEMAN

Connection to, cooperation with others (Sociability)

Address the root cause, don't procrastinate by treating sx's

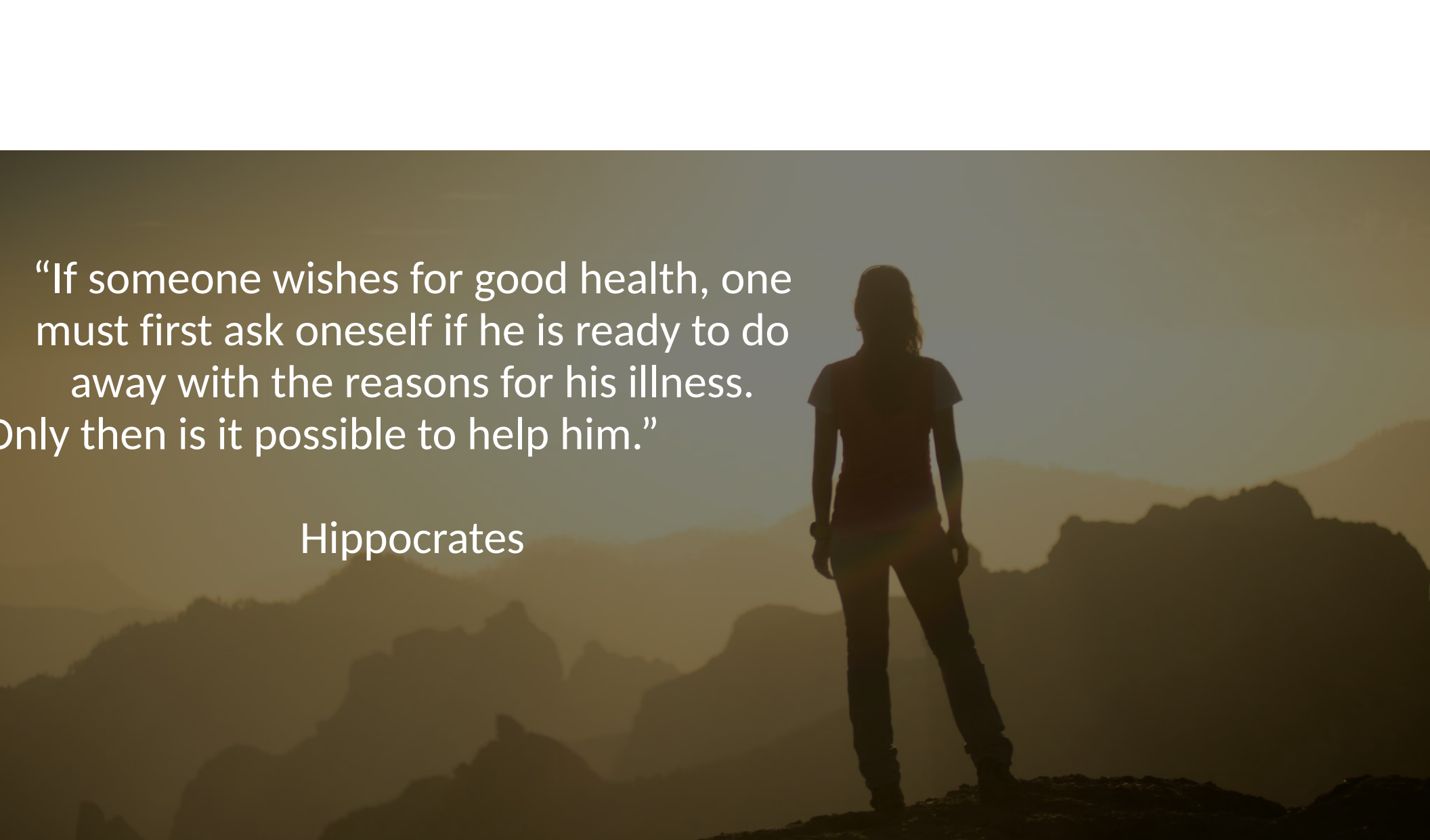
Variety of food confers stability and flexibility

Exercise regularly; we were designed for it

Moderation in energy expenditure and consumption

Avoid others when sick. Avoid chemicals that can make us sick

Nutrition and gut health relates to brain health



“If someone wishes for good health, one must first ask oneself if he is ready to do away with the reasons for his illness. Only then is it possible to help him.”

Hippocrates

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