



Intermittent Fasting (“IF”)

Current Nutritional Research & Protocols

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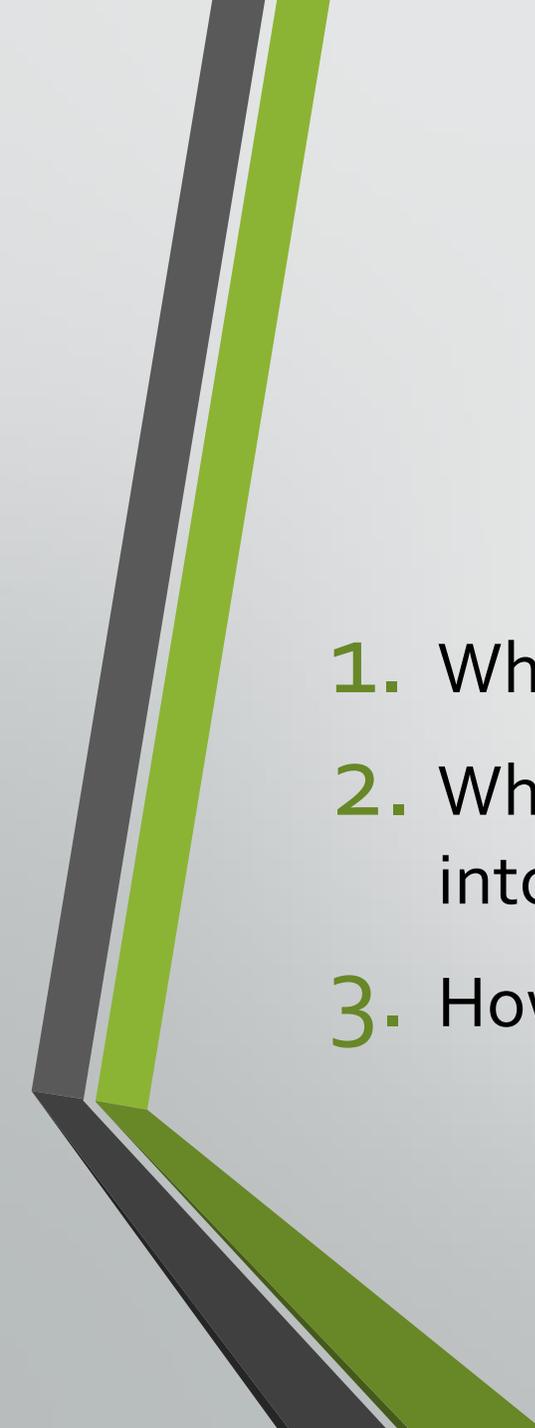
“Start the practice of self-control with some penance; begin with a fast”

Mahavira, 6th Century

Educational Objectives

Upon completion of this session, participants should be better able to:

- Understand the benefits of IF vs. traditional dieting
- Implement current IF protocols
- Identify which patients should consider IF
- Utilize labs to evaluate patient progress



Questions to Consider

1. Which of my patients will benefit from Intermittent Fasting?
2. What is the best approach to incorporate Intermittent Fasting into a patients lifestyle?
3. How do I monitor patients using Intermittent Fasting?

Breakfast: The most important meal of the day, right?



US Guidelines on Breakfast

- **Government Dietary Guidelines 2010:** Eat a nutrient-dense breakfast

"Not eating breakfast has been associated with excess body weight, especially among children and adolescents. Consuming breakfast also has been associated with weight loss and weight loss maintenance, as well as improved nutrient intake."

- **Government Dietary Guidelines 2015:** No guidelines on breakfast

Why We Were WRONG!

Eating Breakfast:

- Prevents depletion of Glycogen
- Prevents the body using fat as energy
- Increases daily load of Insulin (“the fat storing hormone”)
- Leads to eating more calories throughout the day
- May be a contributor to obesity

Obesity: a world-wide epidemic

In the US today, more than **39.8% of adults and nearly 18.5% of children** aged 2–19 years are obese.

Up from 35% and 17%, respectively, in 2014



Obesity prevalence in 2015-2016 varies across regions

- **No state** had a prevalence of obesity **less than 20%**
- 5 states and the District of Columbia: **20% and 25%**
- 23 states, Guam, and Puerto Rico: **25% and <30%**
- 19 states: **30% and <35%**
- 3 states (Arkansas, Mississippi, and West Virginia): **35% or greater**
- The **Midwest** had the **highest** prevalence of obesity (**30.7%**), followed by the South (30.6%), the Northeast (27.3%), and the West (25.7%)

Obesity...What's the Big Deal?

Compared to those at a healthy weight, people who suffer from obesity are at increased risk for many serious diseases and health conditions, including:

- All-causes of death (mortality)
- High blood pressure (Hypertension)
- High LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (Dyslipidemia)
- Type 2 diabetes
- Coronary heart disease
- Stroke

Obesity: Health Consequences

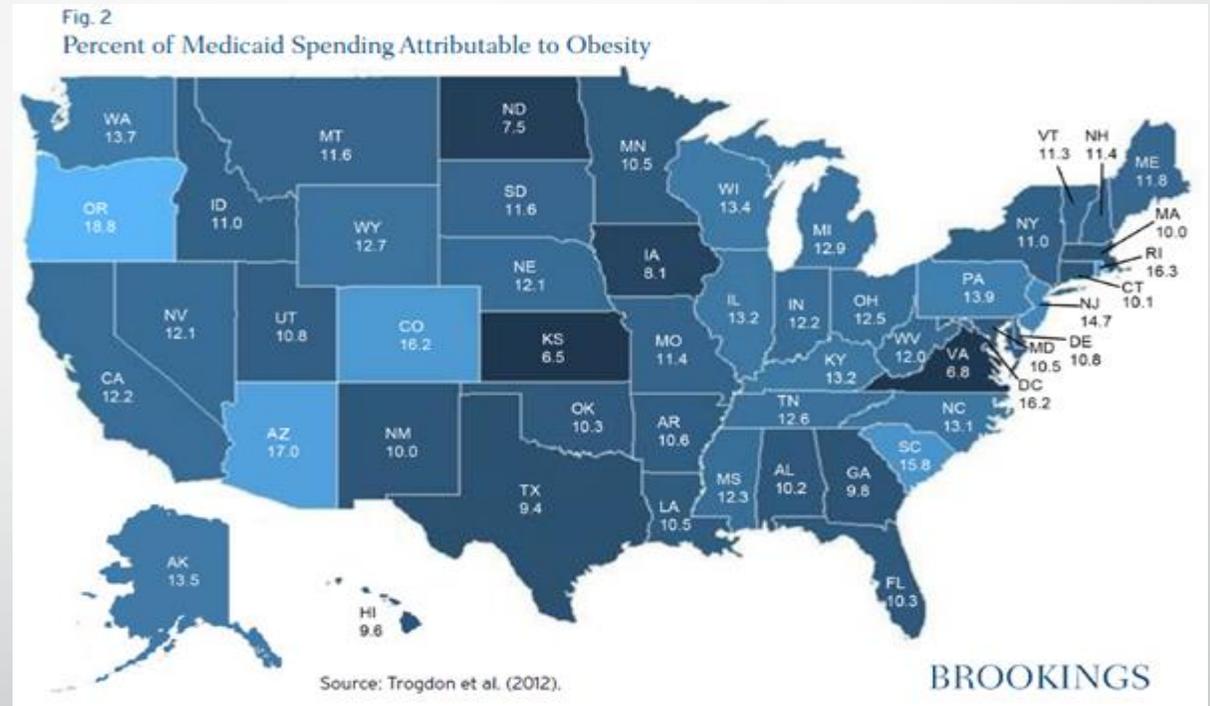
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- Gallbladder disease
- Osteoarthritis (a breakdown of cartilage and bone within a joint)
- Sleep apnea and breathing problems
- Some cancers (endometrial, breast, colon, kidney, gallbladder, liver)
- Low quality of life
- Mental illness (clinical depression, anxiety)
- Body pain and difficulty with physical functioning

Obesity is Expensive

State-Level Estimated Annual Obesity-Attributable Expenditures (2009)

State	(Millions \$)
• Alabama	\$2,505
• Alaska	\$459
• Arizona	\$2,113
• Arkansas	\$1,254
• California	\$15,223
• Colorado	\$1,637
• Connecticut	\$1,719
• Delaware	\$592
• D.C.	\$500
• Florida	\$8,079



The Cost of Obesity Today

- Current estimated health-care costs related to obesity are:
 - **\$190.2 billion (2017) up from \$147 billion (2008) – that's a 30% increase in ~10 years!**
 - 21% of annual medical spending in the United States
 - Direct and additional costs of obesity are stifling businesses and organizations
 - Negative impact on disability costs, unemployment benefits, and absenteeism
 - The 10 cities with the highest obesity rates incur costs of \$50 million per 100,000 residents
 - Absenteeism costs \$4.3 billion annually

Why are we so fat?

Lifestyle patterns that lead to obesity:

- Portion size and portion control
- Processed/packaged food and “fast food”
- Sedentary lifestyles

But...there are some lesser-known potential culprits

- Viral exposure
- Lack of sleep
- Gut Flora imbalance
- Obesogens —Toxins that lead to obesity

A Larger Problem?

Even animals—pets, laboratory animals, and urban rats—have experienced increases in average body weight!

These trends can not be explained by diet and exercise.

Robert H. Lustig, a professor of clinical pediatrics at the University of California stated,

“Even those at the lower end of the BMI [body mass index] curve are gaining weight. Whatever is happening is happening to everyone, suggesting an environmental trigger.”

What is an Obeseogen?

- **Obeseogens:** chemicals in our environment (dietary, pharmaceutical, and industrial); mostly fat soluble compounds that may alter metabolic processes; can predispose some people to gain and/or have difficulty losing weight
- **Obeseogens** are EVERYWHERE. They are found in seafood, air fresheners, cash register receipts, canned goods, flame retardants, nonstick pans, vinyl, plastics, fructose, medications, etc.
- **Obeseogens** increase obesity risk in at least three ways:
 - *Directly affecting fat cells: by either increasing their fat-storage capacity or increasing their number*
 - *Changing metabolism: by both reducing the number of calories burned at rest and promoting the storage of calories as fat*
 - *Changing the way the body regulates feelings of hunger and fullness.*

Obesity – An Epidemic in America

I have this condition that prevents me from going on a diet, I get hungry.



A Change in Lifestyle is Desperately Needed

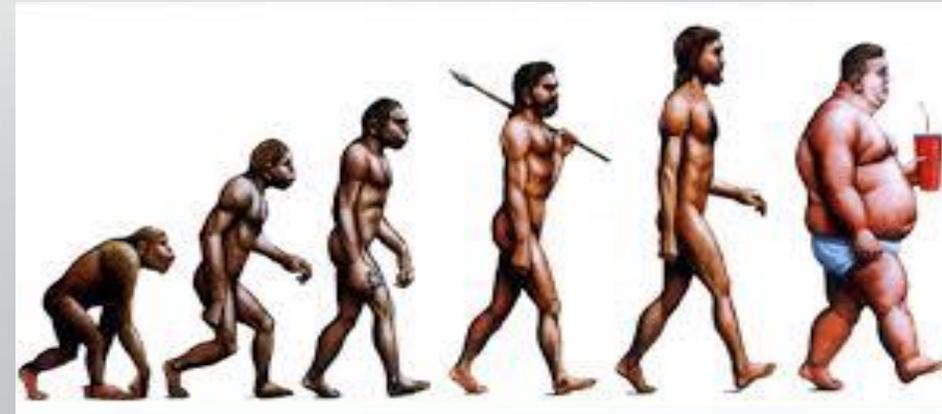
- We are over-fat – Most try dieting.
 - Diets just ***don't*** work!



Why?

- Access to food was limited; grocery stores, refrigeration, and food availability did not exist
- Our bodies evolved to exist without food
- Occasional fasting is more “natural” than eating every 3 to 4 hours
- Unlimited access to food has caused our bodies to be “sugar-burners”
- It is estimated that it takes 12 – 14 hours for the liver to be depleted of glycogen
- Dietary recommendations of when to eat and what to eat: eat 5 – 6 times per day, CHO recommendations prior to 2015, and processed/ packaged food
- Environmental triggers

GO BACK – WE MESSED UP EVERYTHING!



The Body's Response to Eating

- Approximately 20 – 45 minutes after eating, blood glucose levels rise
- Insulin is secreted in response to elevated blood glucose
- Insulin forces glucose into the cells
- Glucose rise and insulin secretion are dependent on foods eaten
- Insulin stops the use of fat as an energy source
- Insulin turns off fat burning and turns on fat storage
- Insulin can cause loss of lean muscle
- Insulin often “over-corrects” blood glucose leaving one hungry and in need of fuel

What is Intermittent Fasting?

- Intermittent fasting (IF) -an *eating pattern* that cycles between periods of fasting and eating
- No specific limit on food categories or calories; only **when** eating occurs
- Intermittent fasting is **not a "diet"**

How it's done:

3 programs are increasing in popularity:

- **The 16/8 Method:** involves skipping breakfast and restricting your daily eating period to 6-8 hours, for example from 1 pm to 7 pm. Then you “fast” for 16-18 hours in between.
- **Eat-Stop-Eat:** This involves fasting for 24 hours, once or twice a week, for example by not eating from dinner one day until dinner the next day.
- **The 5:2 Diet:** On two non-consecutive days of the week, only eat 500-600 calories. Eat normally the other 5 days.

You should ALWAYS eat nutrient-dense food!



Additional Programs

- **The Warrior Diet:** fruits and vegetables during the day, and then a well-rounded, larger meal in the evening
- **Fasting Mimicking Diet:** 5 days per month for three months, followed by a modified fasting-type diet
- **The Daniel Fast:** a type of spiritual fasting based off of Daniel's experiences in the Bible's Book of Daniel
 - Partial fast eating vegetables, fruits, and other healthy whole foods
 - Meat, dairy, grains (unless they're sprouted ancient grains), and drinks like coffee, alcohol, and juice are avoided.
 - Standard duration: 21 days

The “Starvation Mode” Myth

- **‘Resting energy expenditure’** in short-term starvation is **actually increased** as a result of an increase in serum norepinephrine
- Fatty acids are mobilized, leading to an increase in plasma concentrations of fatty acids and ketone bodies and to **an increased rate of fat oxidation**
- **Glycogen stores** are depleted after about a 16-24 hour fast
- **Gluconeogenesis** is essential for providing glucose to the brain, which does not easily utilize ketone bodies to cover energy requirements

The “Starvation Mode” Myth

continued

- **Decline in blood glucose** during periods of fasting so insulin secretion decreases
- **Increased lipolysis** and release of amino acids from muscle tissue
 - Amino acids are precursors of gluconeogenesis in the liver during starvation
- **Catecholamines** are released, and their presence **elevates metabolic rate** in a dose-dependent fashion

Fast, but Not For Too Long

After 72 hours, metabolism slows:

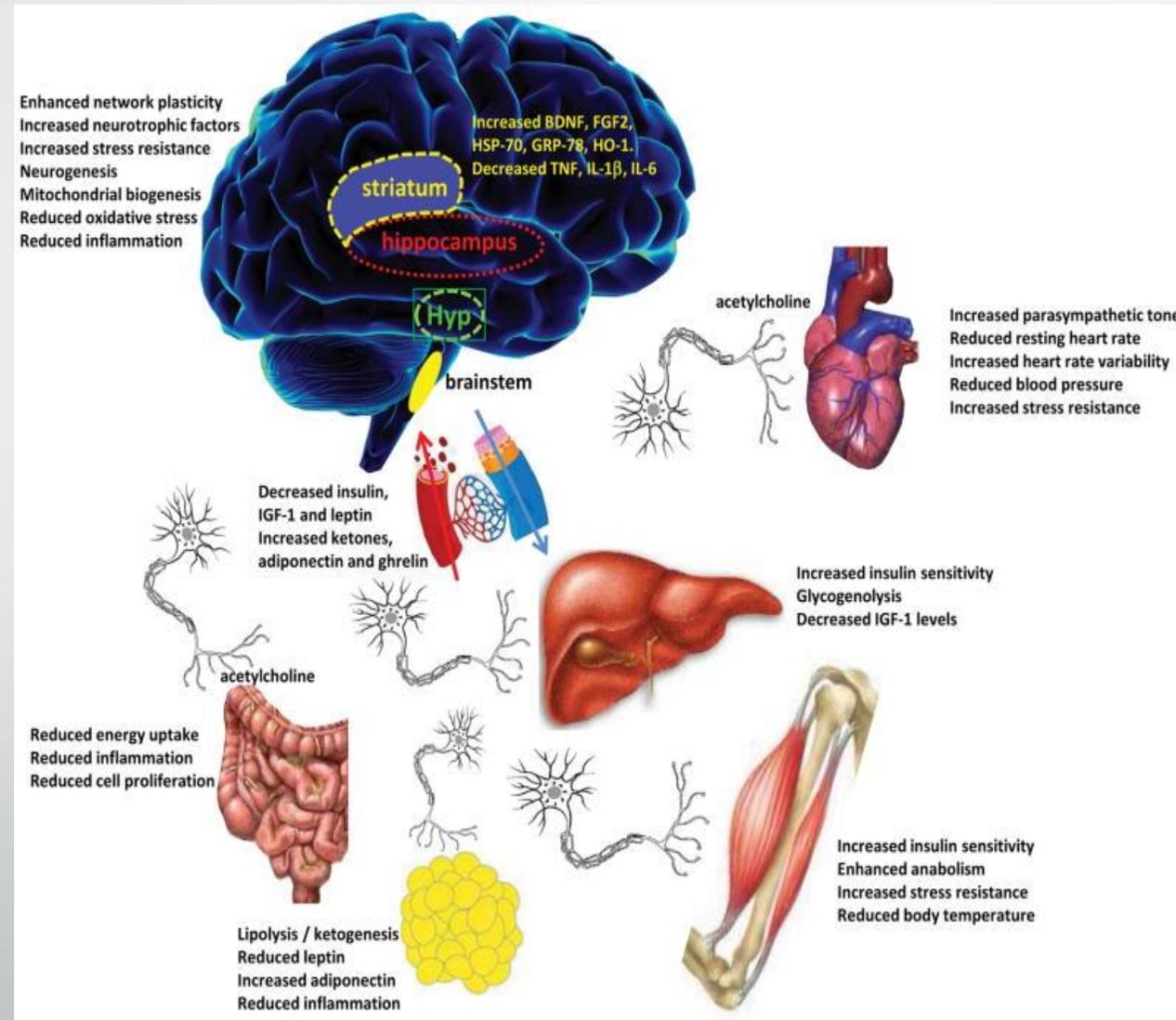
- Long-term fasting may impede weight loss
- Metabolism after 3 days of fasting was examined - Glucose production rate declined 38% and resting **metabolic rate decreased 8%** during prolonged fasting
- Plasma concentrations of insulin and triiodothyronine (T₃) were reduced by fasting whereas plasma glucagon concentrations were increased

What you eat still matters...

- Eating less requires more nutrient-dense food to avoid malnutrition
- Binging creates a glucose and insulin surge
- Healthy fats are important due to increased fat utilization
- High carbohydrate intake turns on enzymes that promote fat storage
- Keep protein intake to .5g per pound of lean body mass or .8g per kilogram of body weight



Benefits of Intermittent Fasting



Benefits

(continued)

- Intermittent fasting helps reset your body to burn fat for fuel
- Helps optimize insulin sensitivity and mitochondrial health and energy production
- Involves cutting calories in whole or in part, either a couple of days a week, every other day, or even daily.
- It's one of the most effective interventions for normalizing your weight
- Fasting has a number of health benefits, including improved cardiovascular health, reduced cancer risk, gene repair, increased longevity, and dementia prevention

Benefits

(continued)

- Your body is given the time it needs to remove waste materials from cells; a process called **autophagy**
- Cells repair more efficiently – cells switch to a protected anti-aging mode
- Human Growth Hormone rises
- Fasting modifies insulin levels helping the insulin feedback loop regulate itself
- Reduce oxidative stress
- Reduced inflammation

100 Person FMD-Study

- Study conducted at USC Medical center by Valter Longo, PhD
- Results:

Weight Loss	More than 8 lbs. in obese subjects
Muscle Mass	Increased relative to body weight
Glucose	12mg/dl in prediabetic subjects, no effect in low-fasting glucose subjects
Blood Pressure	6mmHg decrease in subjects with moderately high BP
Cholesterol	20mg/dl decrease
IGF-1	55ng/ml
CRP	1.5mg/dl decrease and a return to normal
Triglycerides	25mg/dl decrease

- Study showed a reduction in risk factors for diabetes, cancer, and cardiovascular disease
- FMD is a proprietary program developed by Valter Longo, PhD.

IF and Women's Health

- Considered the “missing link” for enhancing women's health
- Improves reproductive and mental health
- Prevents and ameliorates cancer, musculoskeletal disorders
- Improves parathyroid hormone secretion, thus improving bone health
- Greatly lessens symptoms of Rheumatoid Arthritis (RA) by reducing inflammatory cytokines, prostaglandins, and leukotrienes
- Reduces food intolerance and gastrointestinal permeability
- Cardio-protective – reduced body fat and blood pressure, improved lipid profile, and normalized heart rate

IF and Vascular Health in Obesity

- **High-protein-intermittent fasting-low calorie plan compared to a heart-healthy diet plan**
 - Both plans showed improvement in body weight, BMI, blood lipids, and arterial function
 - IF as effective as continuous energy restriction
- **Compared to the heart-healthy diet:**
 - IF participants minimized weight gain after one year
 - Arterial function showed continued improvement

IF and Cancer

"Calorie restriction (CR) is arguably the most potent, broadly acting dietary regimen for suppressing the carcinogenesis process, and many of the key studies in this field have been published in Carcinogenesis."

- When calories are abundant, glycolytic cells have an advantage
- Cancer cells have impaired mitochondrial function and membrane potential
- IF protects normal cells from chemotherapy
- IF takes advantage of cancer cells' inability to survive in altered glucose situations
- Cycles of starvation as effective as chemotherapeutic agents in:
 - Cancer progression
 - Increased effectiveness of drugs in melanoma, glioblastoma, and breast cancer
 - Increased apoptosis of cancer cells

Intermittent Fasting results in:

- Reduced Glycogen
- Glycogen is stored first and burned first
- If you eat 3 meals a day, you never deplete glycogen unless you exercise

Energy shifts to fat burning after 12 -16 hours



Beneficial Changes from IF

- Increase in Human Growth Hormone (“HGH”)
- Normalizes the hormone Ghrelin (hunger hormone)
- Decrease in triglycerides
- Increase in insulin sensitivity
- Increase in longevity
- Brain and neuro-protective

IF Leads to Increase in Human Growth Hormone

- HGH levels increase as much as 5-fold during fasting.
- HGH stimulates collagen synthesis in skeletal muscle and tendons
- Increased HGH accelerates lipolysis

This has benefits for fat loss and muscle gain

"Starvation-induced enhancement of GH secretion is mediated by an increased release frequency of Growth Hormone Releasing Hormone (GHRH), and longer and more pronounced periods of somatostatin (growth-inhibiting hormone) withdrawal."

J Clin Endocrinol Metab. 1992 Apr;74(4):757-65 <https://www.health.harvard.edu/diseases-and-conditions/growth-hormone-athletic-performance-and-aging>,



Increase in Metabolic Rate

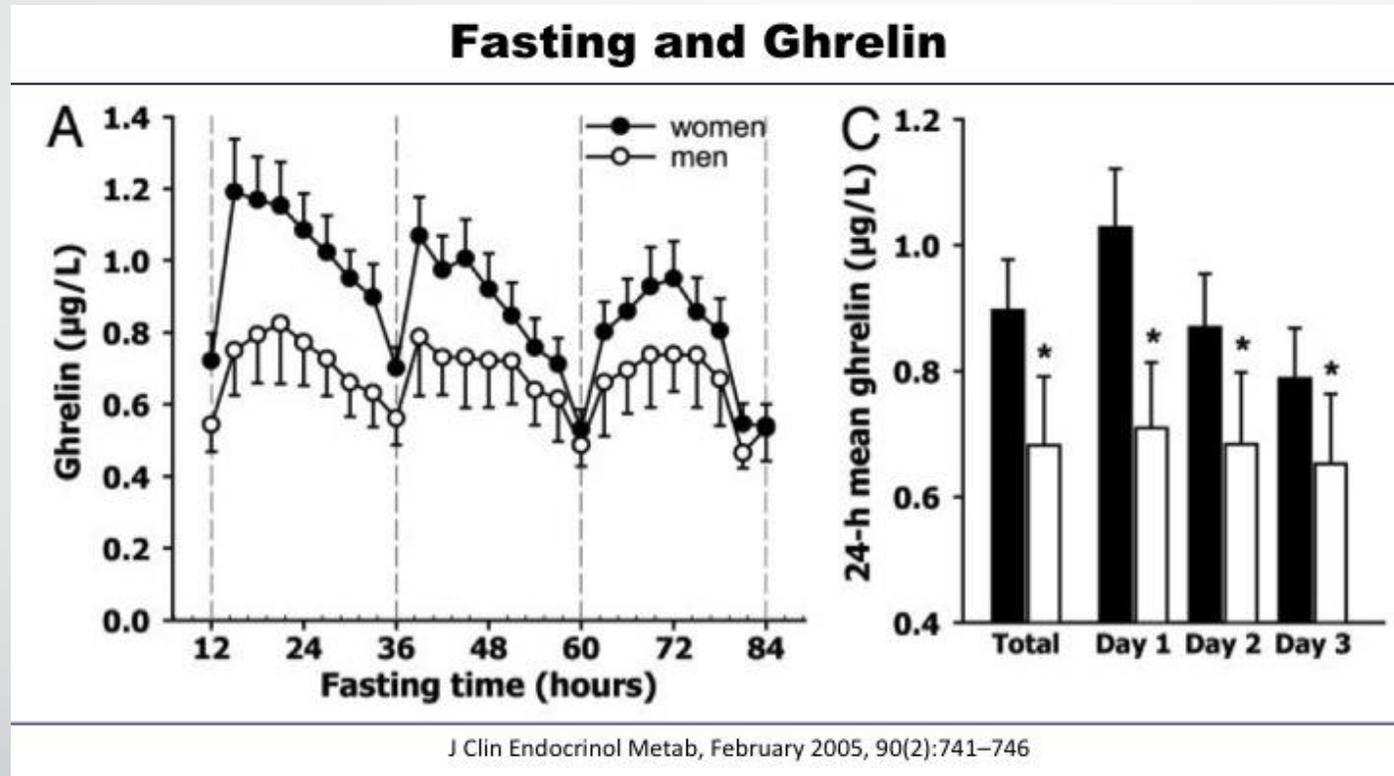
- Lower insulin levels, higher growth hormone levels, and increased amounts of norepinephrine (noradrenaline) all increase the breakdown of body fat and facilitate its use for energy
- For this reason, short-term fasting actually increases your metabolic rate by 3.6-14%, helping burn calories
- It boosts your metabolic rate (increases calories out) and reduces the amount you eat (reduces calories in)
- According to a 2014 review of the scientific literature, intermittent fasting can cause weight loss of 3-8% over 3-24 weeks
- The people also lost 4-7% of their waist circumference, which indicates that they lost belly fat, the harmful fat in the abdominal cavity that causes disease
- One review study also showed that intermittent fasting caused less muscle loss than continuous calorie restriction

Normalizes Balance of Ghrelin and Leptin

Ghrelin and leptin are hormones that hold the key to appetite and weight loss

- Ghrelin is lowest at 9:00 A.M. based on circadian rhythm
 - This reinforces that breakfast is **not** the most important meal
 - Ghrelin stays stable during fasting
 - Ghrelin signals hunger; leptin gives the feeling of fullness
-
- Martin B, Pearson M, Kebejian L, Golden E, Keselman A, Bender M, Carlson O, Egan J, Ladenheim B, Cadet JL, Becker KG, Wood W, Duffy K, Vinayakumar P, Maudsley S, Mattson MP. Sex-dependent metabolic, neuroendocrine, and cognitive responses to dietary energy restriction and excess. *Endocrinology*. 2007;148:4318–4333

Fasting and Ghrelin



Ghrelin decreases after 3 days of fasting

IF Impact on Ghrelin Levels

Ghrelin is normalized in Intermittent Fasting

High levels of Ghrelin:

- Cause weight gain and make weight loss difficult as it stimulates hunger and therefore increases food intake
- Favor the accumulation of central adiposity
- Promote the formation of abdominal fat near the liver
- Promote fatty liver and increase the risk of developing resistance to insulin

IF Impact on Leptin Levels

- Leptin is a hormone produced by fat cells; it is the satiety hormone
- You become leptin-resistant by the same general mechanism that you become insulin-resistant – by continuous overexposure to high levels of the hormone
- One study with 80 participants measured leptin levels during intermittent fasting and found that levels were lower at night during the fasting period
- Levels of leptin are decreased in obese rats during intermittent fasting, indicating improved leptin sensitivity

Martin B, Pearson M, Kebejian L, Golden E, Keselman A, Bender M, Carlson O, Egan J, Ladenheim B, Cadet JL, Becker KG, Wood W, Duffy K, Vinayakumar P, Maudsley S, Mattson MP. Sex-dependent metabolic, neuroendocrine, and cognitive responses to dietary energy restriction and excess. *Endocrinology*. 2007;148:4318–4333

The role of leptin and ghrelin in the regulation of food intake and body weight in humans: a review Klok,MD, Jakobsdottir S, Drent ML

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3956913/>, <https://draxe.com/intermittent-fasting-benefits/>

IF Impact on Leptin Levels *cont.*

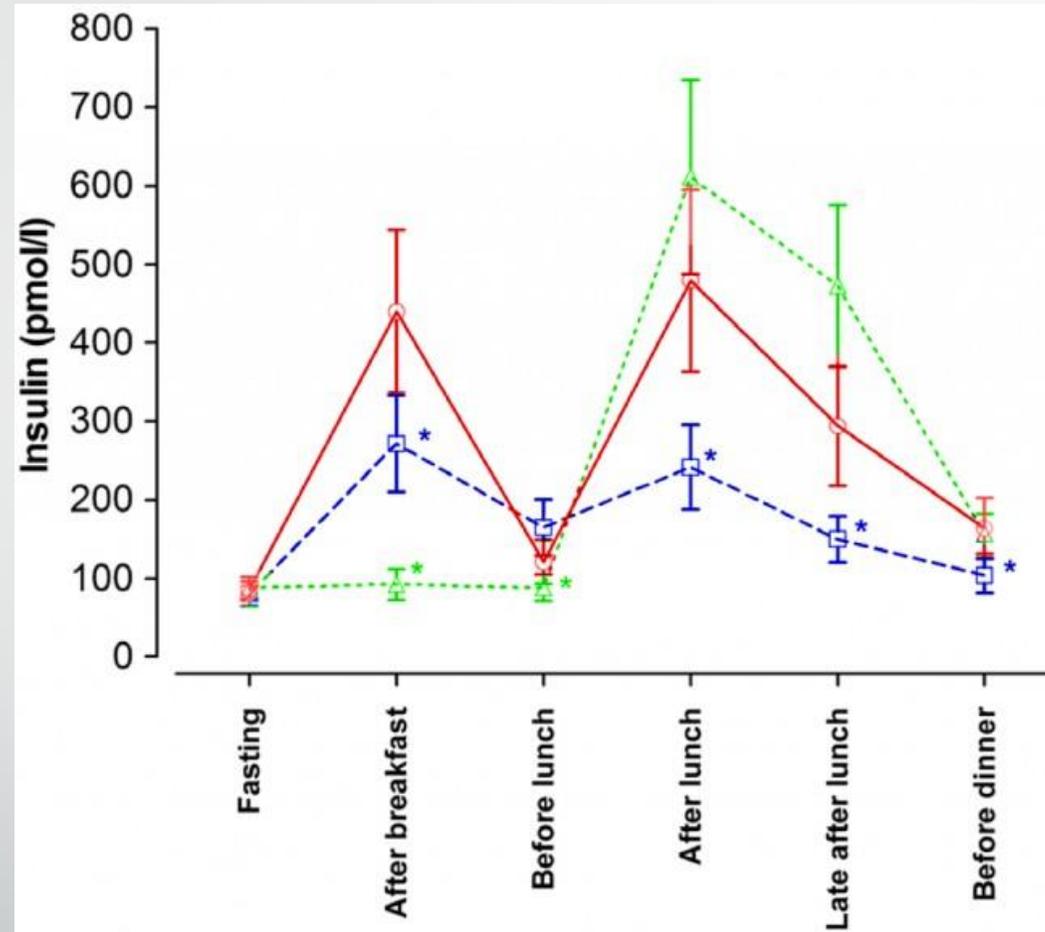
- Leptin helps signal when it's time to stop eating
- Leptin levels drop when you're hungry and increase when you're feeling full
- Too much leptin can cause leptin resistance, which makes it harder for it to effectively turn off hunger cues
 - Individuals who are overweight or obese tend to have higher amounts of leptin and are leptin-resistant
- Lower levels of leptin could translate to less leptin resistance, less hunger, and potentially even more weight loss

Leptin *(continued)*

- “In **leptin resistance**, your **leptin** is high, which means you're fat, but your brain can't see it. In other words, your brain is starved, while your body is obese. And that's what obesity is: it's brain starvation.” Not only is **leptin** part of the hunger system, it's also part of the reward system, Lustig says.” Mar 11, 2010

Improvement in Insulin Sensitivity

Red = low-fat
Green = fasting
Blue = low-carb

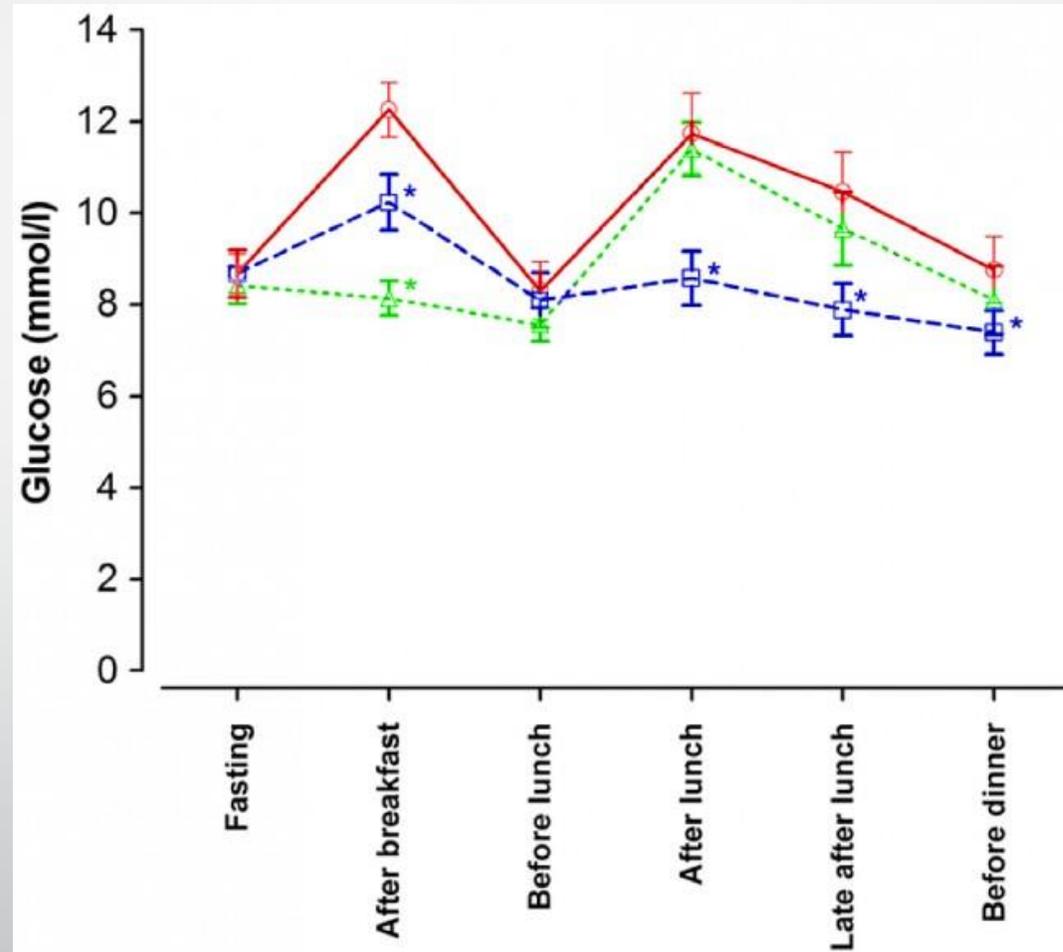


Insulin sensitivity improves and levels of insulin drop dramatically.

Lower insulin levels make stored body fat more accessible

IF Impact on Blood Glucose

Red = low-fat
Green = fasting
Blue = low-carb



Preserves Lean Tissue

- Less fat-free mass was lost in response to Intermittent Fasting versus daily calorie restriction
- An increase in HGH allows for lean tissue preservation
- These findings suggest that these diets are equally as effective in decreasing body weight and fat mass
- Intermittent Fasting may be more effective for the retention of lean mass



Neuroprotective



- Challenges the brain by activating adaptive stress response
- Increases production of new nerve cells from stem cells in Hippocampus
- Ketones are produced and suppress seizures as well as other brain disorders
- Increase in Neurotrophic factor BDNF (Brain-derived neurotrophic factor) in brain increases number of mitochondria in neurons
- Wards off neurodegenerative diseases like Alzheimer's and Parkinson's

Sugarman Joe, Are there any Proven Benefits to Fasting, Johns Hopkins Health Review, 2016

Mattson MP Energy intake and Exercise as Determinants of Brain Health and Vulnerability to Injury and Disease

Increase in Longevity

- Intermittent Fasting on Gene expression: There are changes in the function of genes related to longevity and protection against disease.
- Fasting induces oxidative stress and a surge in free radicals, the molecules most associated with aging.
- Oxidative stress stimulates the SIRT3 gene to increase production of sirtuins, protective proteins associated with longevity.
- Increase to SIRT3 is involved in protective cell responses.

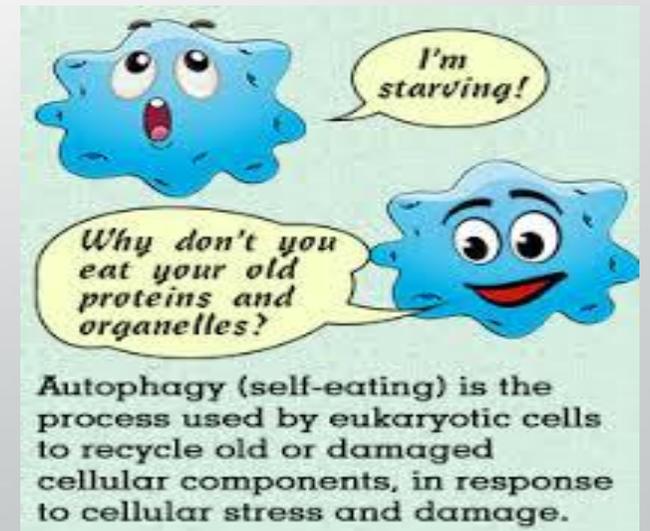
Scientific American Date: February 2006 Unlocking the Secrets of Longevity Genes,
Ageing Research Reviews Volume 5, Issue 3, August 2006, Pages 332–353

Managing Mitochondria

- Basic cell biology – cells ability to process energy over time
- Energy handling decreases over time
- Leads to aging and age-related disease
- Mitochondria exist in networks that change shape based on energy demand
- Fused networks are considered “youthful”
- Fasting provides an intervention that promotes youthful networks
- Youthful networks increase lifespan by communicating with organelles called peroxisomes to modulate fat metabolism

Cellular Repair and Disease Prevention

When in a fasted state, your cells initiate cellular repair processes. This includes autophagy, where cells digest and remove old and dysfunctional proteins that build up inside cells



Autophagy

- Autophagy is one of the **chief health benefits** of fasting
 - A self-degradative process that is important for **balancing sources of energy** at critical times in development and in response to nutrient stress
- Housekeeping role in removing intracellular aggregated proteins, clearing damaged organelles, such as mitochondria, endoplasmic reticulum, and peroxisomes, as well as **eliminating intracellular pathogens**
- Protects against genome instability and prevents necrosis, giving it a key role in **preventing diseases** such as cancer, neurodegeneration, cardiomyopathy, diabetes, liver disease, autoimmune diseases, and infections

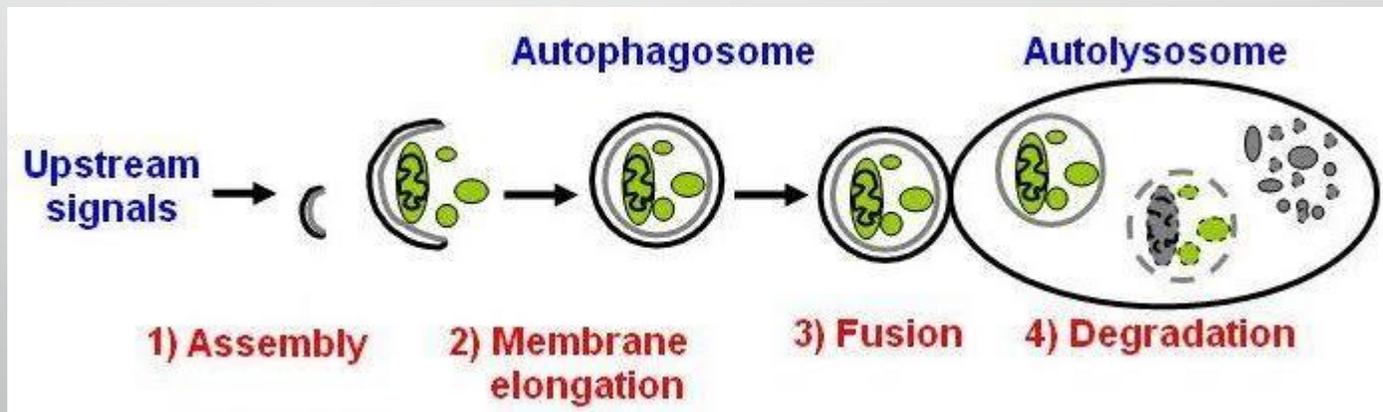
Autophagy

Autophagy is upregulated in response to extra- or intracellular stress and signals such as starvation, growth factor deprivation, ER stress, and pathogen infection

Defective autophagy plays a significant role in human pathologies, including cancer, neurodegeneration, and infectious disease

Double-membrane vesicles, termed autophagosomes, engulf and degrade long-lived proteins, damaged organelles, and even invasive pathogens

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831538/>



Inducing Autophagy

- Fasting
- Exercise
- Coffee and tea

Supplements shown to induce Autophagy

Some supplements also activate autophagy: these are so-called *calorie-restriction mimetics*

- Hydroxycitrate – derivative of citric acid (garcinia cambogia)
- Nicotinamide
- Resveratrol
- Epigallocatechin gallate (EGCG)

Stewart, W. K., and Laura W. Fleming. "Features of a successful therapeutic fast of 382 days' duration." *Postgraduate medical journal* 49.569 (1973): 203-209.

Madeo, Frank, et al. "Caloric restriction mimetics: towards a molecular definition." *Nature Reviews Drug Discovery* (2014).

Inhibitors of Autophagy

- Some commonly used substances can inhibit autophagy
- Most notable are vitamins C and E
- Much recent research has shown that vitamins C and E can diminish the health benefits of exercise
 - If taken daily, a gram of vitamin C is enough to do this
- Many of the benefits of calorie restriction come from the stress response of the organism, specifically the response to free radicals or reactive oxygen species
 - Vitamins C and E blunt this response

Labs to Watch

- Triglycerides – levels should decrease (due to break down into FFA)
- Insulin – decrease as sensitivity improves
- HGH
- Testosterone
- Hemoglobin A1C
- HS-CRP – decrease as inflammation is reduced

Also –

- Weight loss
- Blood Pressure Reduced
- Waist Circumference Reduced

The Research Shows

In animal and human studies, intermittent or periodic fasting shown to protect against:

- Diabetes
- Cancers
- Heart disease
- Neurodegeneration

In humans, it is also shown to reduce:

- Obesity
- Hypertension
- Asthma
- Rheumatoid arthritis.

"Thus, fasting has the potential to delay aging and help prevent and treat diseases while minimizing the side effects caused by chronic dietary interventions."

The Main Health Benefits of Intermittent Fasting:

- **Autophagy:** cellular cleaning and repair
- **Weight Loss:** intermittent fasting can help you lose weight and belly fat, without having to consciously restrict calories
- **Insulin resistance:** Intermittent fasting can reduce insulin resistance, lowering blood sugar by 3-6% and fasting insulin levels by 20-31%. Thus protect against type 2 diabetes.
- **Inflammation:** Studies show reductions in markers of inflammation, a key driver of many chronic diseases .
- **Heart Health:** Intermittent fasting may reduce LDL cholesterol, blood triglycerides, inflammatory markers, blood sugar and insulin resistance.
- **Cancer:** Animal studies suggest that intermittent fasting may help prevent and treat cancer.
- **Brain Health:** Intermittent fasting increases a brain hormone called BDNF, and may aid the growth of new nerve cells. It may also protect against Alzheimer's disease.
- **Anti-aging:** Intermittent fasting can extend lifespan. Studies showed that fasted rats live as much as 36-83% longer.

Use Caution/ Avoid with IF in these Patients

- Hypoglycemic
- Brittle Diabetic
- Trying to conceive
- Pregnant (and/or breastfeeding)
 - Low blood pressure
 - Take medications
 - Underweight
- History of eating disorders
- History of amenorrhea

Recommended IF Plan

- Easiest for most patients will be the 16/8 program
- Start eating at 12:00/1:00 (12:00 Earliest)
- Complete feeding by 7:00 (8:00 Latest)
- Nothing with calories until 1:00 – Coffee, tea, calorie free drinks (not sweetened with artificial sweeteners)
- Eat whole foods – nothing with a label
- Focus on High quality Protein – at least .8g/kg
- Drink $\frac{1}{2}$ body weight in ounces in water daily

A TYPICAL DAY OF 16/8 IF

- 1st Meal – 12:30 P.M.
- Mini meal or snack 3:30 P.M.
- 2nd (last) meal – 7:30 P.M. (finish by 8:30)
- Fast time is 16 hours
- Eating time is 8 hours
- Focus on nutrient-dense food
- Vegetables, proteins, and healthy fats

Suggested Daily Food Plan

Therapeutic for weight loss, T2D, Syndrome X

- **ALL FOOD SHOULD BE ORGANIC and FRESH**

- **Lean Protein** – 3 – 4 servings per day (4 oz. is average serving size)

- Beef, fish, poultry, eggs

- **Dairy** – if no sensitivity/ allergy

- ½ cup cottage cheese, ricotta cheese, 2 oz. mozzarella, 6 TBS grated parmesan

- **Non-starchy Vegetables** – Eat at least 5 – ½ cup servings per day

- Artichoke, asparagus, broccoli, Brussel Sprouts, cabbage, cauliflower, celery, cucumber, green beans, green-leafy vegetables*, mushrooms, onions, peppers, snow peas, squash, tomatoes

- **Legumes** – 1 serving per day

- ½ cup Cooked beans, peas, lentils; ¼ cup hummus

Daily Food plan - 2

- **Nuts & Seeds** – 1 serving per day
 - 10 – 12 almonds, hazelnuts, 14 walnut halves, 3 TBS grated coconut, 2 TBS peanuts, pine nuts, pumpkin seeds, sunflower seeds, 1 TBS nut butter
- **Fats** – 6 servings per day
 - 1 Tsp olive oil, coconut oil, grapeseed oil, flaxseed oil. MCT oil
 - ¼ avocado
 - 3 TBS coconut milk
- **Optional** – Therapeutic protein
 - 1 scoop per day

CASE STUDY

- SEX: M
- AGE: 41 YO
- DX: Benign essential hypertension, hyperlipidemia, Migraines, Metabolic Syndrome, obesity, hypothyroidism, testicular failure, gout, fatigue, depression, generalized anxiety
- Goals: Weight loss, BP regulation, increase energy, increase libido, correct Metabolic Syndrome
- Participates in strenuous cardio and weight exercise

CASE STUDY- RESULTS

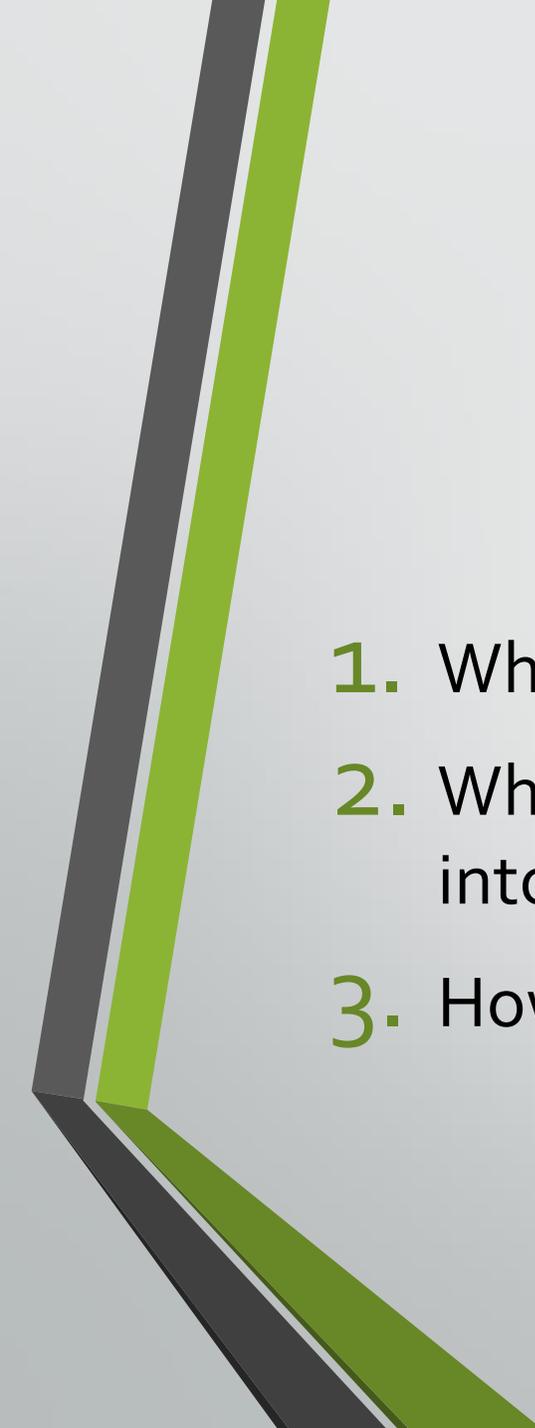
Date of visit	Weight	BP	BMI	O ₂ SAT	Pulse	RR	Plan
05/29/2015	269.6	158/110	37.6	98%	90	18	MD
07/14/2015	Rx eval	N/A	N/A	N/A	N/A	N/A	MD
02/11/2016	274.3	177/100	38.2	97%	78	18	Nutrition
02/26/2016	No vitals						Begin IF
03/11/2016	No vitals						IF
03/24/2016	251	151/100	35	99%	81	18	IF (RX stop)
04/12/2016	247	160/103	34.4	97%	77	15	IF
05/05/2016	239.8	143/97	33.4	98%	80	16	IF
05/25/2016	237	147/90	33.1	99%	66	15	IF
06/10/2016	233	129/94	32.5	99%	68	16	IF
06/29/2016	232	129/86	32.4	99%	73	16	IF
07/13/2016	229	123/75	32	99%	66	16	IF
07/20/2016	224	121/76	31.2	99%	64	16	IF
Pt decides	continue	on his	own				

CASE STUDY- LABS

Date	Glucose	HA1c	CRP	Insulin	Triglycerides
01/26/2016	98	5.8	4.9	24.4	356
05/20/2016	94	5.4	3.7	18.2	138
07/11/2016	90	5.2	2.5	10.1	100

Additional Lifestyle Changes

- Manage Stress – Breathing techniques, Yoga, Therapy, meditation, etc.
- Sleep – 6-8 hours uninterrupted good quality sleep
- Consider proper supplements -Make recommendations if comfortable or send to local Nutrition Professional
- Probiotic – L Rhamnosis linked to improved body comp and weight loss
- Exercise – probably HIIT is best



Questions to Consider

1. Which of my patients will benefit from Intermittent Fasting?
2. What is the best approach to incorporate Intermittent Fasting into a patients lifestyle?
3. How do I monitor patients using Intermittent Fasting?



Fasting is at the foundation of the body's ability to protect, repair, and rejuvenate itself."

–Valter Longo, PhD



THANK YOU!!!

Questions?