

INTERMITTENT FASTING AND KETOGENIC DIET

Presented by

Mindfulness In Biz

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INTERMITTENT FASTING AND KETOGENIC DIET

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FASTING BENEFITS

We are lutes, no more, no less. If the sound box is stuffed full of anything, no music.

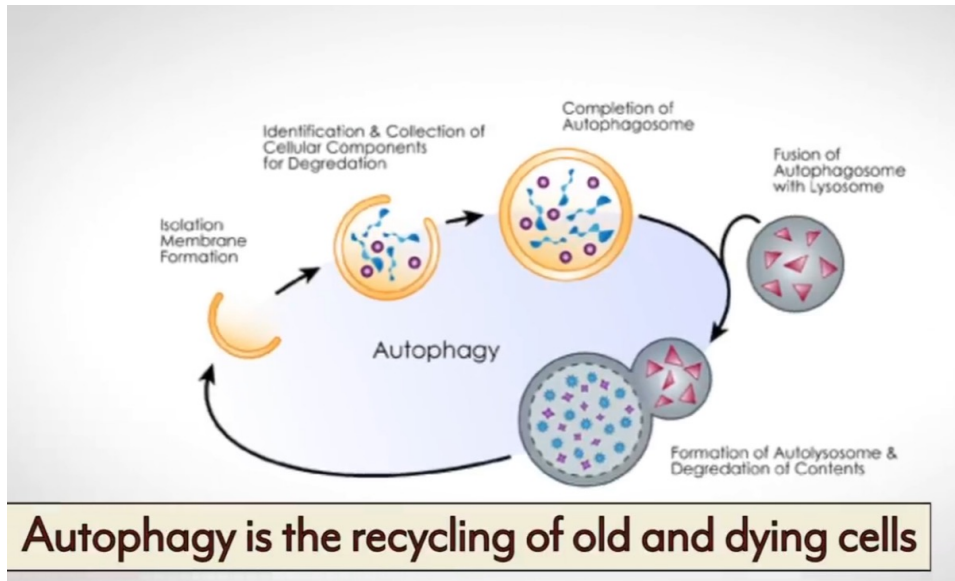
*If the brain and the belly are burning clean with **fasting**, every moment a new song comes out of the fire.*

The fog clears, and a new energy makes you run up the steps in front of you....

~Rumi

FASTING BENEFITS

- Fasting reduce fat accumulation and prevent fatty liver
- Fasting can increase insulin sensitivity
- Fasting can improve metabolic syndrome
- Fasting can increase the number of stem-cells
- Fasting can turn on the autophagy process



FASTING BENEFITS

- **Autophagy** is the process of 'self-eating' of damaged cells;
- As we age, or even as we're young, proteins and DNA become damaged and they turn over, so we need very healthy proteins and peptides (chains of amino acids) and DNA and RNA. Due to variety of stresses, from **oxidative stress** to **glycated stress**, different forms of stresses can damage those proteins and peptides. We therefore need to remove them quickly to get new healthy on in place of those, so we can optimally function in the cell;
- With **exercise** and/or **reducing the calories**, the autophagy process will be turned on, and help again the cell to recycle and to repair, and become healthier and more resistant against stress.



FASTING BENEFITS

Exercise

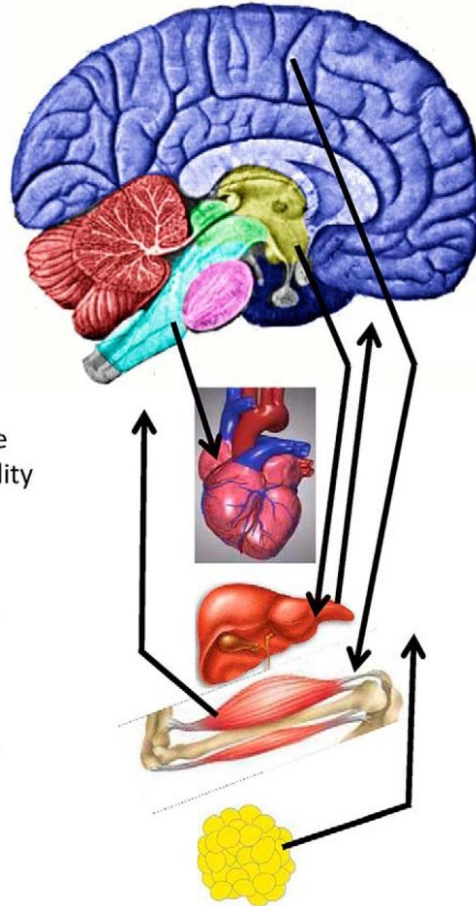
Neurogenesis
 Synaptogenesis
 Synaptic plasticity
 Cognitive function
 Motor function
 DNA repair
 Mitochondrial biogenesis
 Reduced inflammation

Decreased resting heart rate
 Increased heart rate variability
 Decreased blood pressure

Increased insulin sensitivity
 Ketone body production

Increased insulin sensitivity

Fatty acid mobilization
 Reduced inflammation



Intermittent Fasting

Neurogenesis
 Synaptogenesis
 Synaptic plasticity
 Cognitive function
 Motor function
 Reduced inflammation
 Enhanced autophagy

Decreased resting heart rate
 Increased heart rate variability
 Decreased blood pressure

Increased insulin sensitivity
 Ketone body production

Increased insulin sensitivity

Fatty acid mobilization
 Reduced inflammation

Exercise, Energy Intake, Glucose Homeostasis, and the Brain

Henriette van Praag, Monika Fleshner, Michael W. Schwartz and Mark P. Mattson

Journal of Neuroscience 12 November 2014, 34 (46) 15139-15149; DOI: <https://doi.org/10.1523/JNEUROSCI.2814-14.2014>

HOW TO START INTERMITTENT FASTING



1. Normal three meals, eat dinner early, don't eat snacks when staying up late
2. Two meals a day, no breakfast or lunch, early dinner (Breakfast at 0700 and lunch finish at 1300, or lunch at 1200 and dinner finish at 2000)
1. Eat food only 4-5 hours a day

A very low caloric intake in 16 plus hours a day

DAILY SCHEDULE OF INTERMITTENT FAST AND FASTED EXERCISE

- Wake up.
- Do some form of **exercise** (help to get into ketosis by stimulating fat oxidation, depleting glycogen stores, and improving insulin levels)
- Do some work and drink **water** as you recover.
- **Eat** your first high protein ketogenic meal (at least 16 hours after the last meal you ate yesterday)
 - Doing this allows you to take advantage of the increased insulin sensitivity that your cells have after exercise. The excess protein from your meal will be shuttled into cells without causing a significant rise in insulin.
 - This will allow your body to burn fat for fuel and shift into ketosis, while it uses protein to rebuild and recover — The ideal scenario.
- **Eat** 1 to 2 more meals throughout the day that meet your macronutrient needs.
 - By doing this, you can maximize your body's ability to use protein to re-build while it uses fat and ketones as fuel.

WAYS OF INTERMITTENT FASTING

INTERMITTENT FASTING



INCREASES

- ↑ Ghrelin levels to reduce overeating
- ↑ Insulin and leptin sensitivity, lowering risk of diabetes, heart disease and cancer
- ↑ Ability to become Keto-Adapted turning your body into a fat burner!

DECREASES

- ↓ Triglycerides, lowering heart disease risk
- ↓ Inflammation and free radical damage
- ↓ Weight gain and metabolic disease risk

EXAMPLE SCHEDULE

Fast
(7AM - 8AM)

Workout
(1 hour)

Eating Window
(9AM - 3PM)

Fast
(3PM-10PM)


Sleep
at least 8 hours

If pregnant, nursing or if you have metabolic syndrome, don't fast until you have fixed your insulin issues or are no longer breastfeeding.

Maria Mind Body Health LLC
mariamindbodyhealth.com

Intermittent fasting

24hrs
Twice per week



Drink

- ☕ | Water
- ☕ | Black Coffee
- ☕ | Black Tea
- ☕ | Diet drinks


No Eating

- 🍷 | No Solids
- 🍌 | No Fruit
- 🔥 | No Calories
- 🍬 | No Sugars

Exercise during the fast
Experiment what works for you




*** 16th Hour is the most difficult**
Plan around the 16th hour
Be flexible - if you're going to eat - eat!
Move your start time to suit your schedule
Start at 20h00 till 20h00 the next day



ANDREA J. CLARK

The IF KETO DIET

Combining Ketosis and Intermittent Fasting
for Rapid & Sustainable Fat Loss



KETOGENIC DIET WHAT TO EAT

THEINDIANSPOT.COM

PROTEIN



FATS

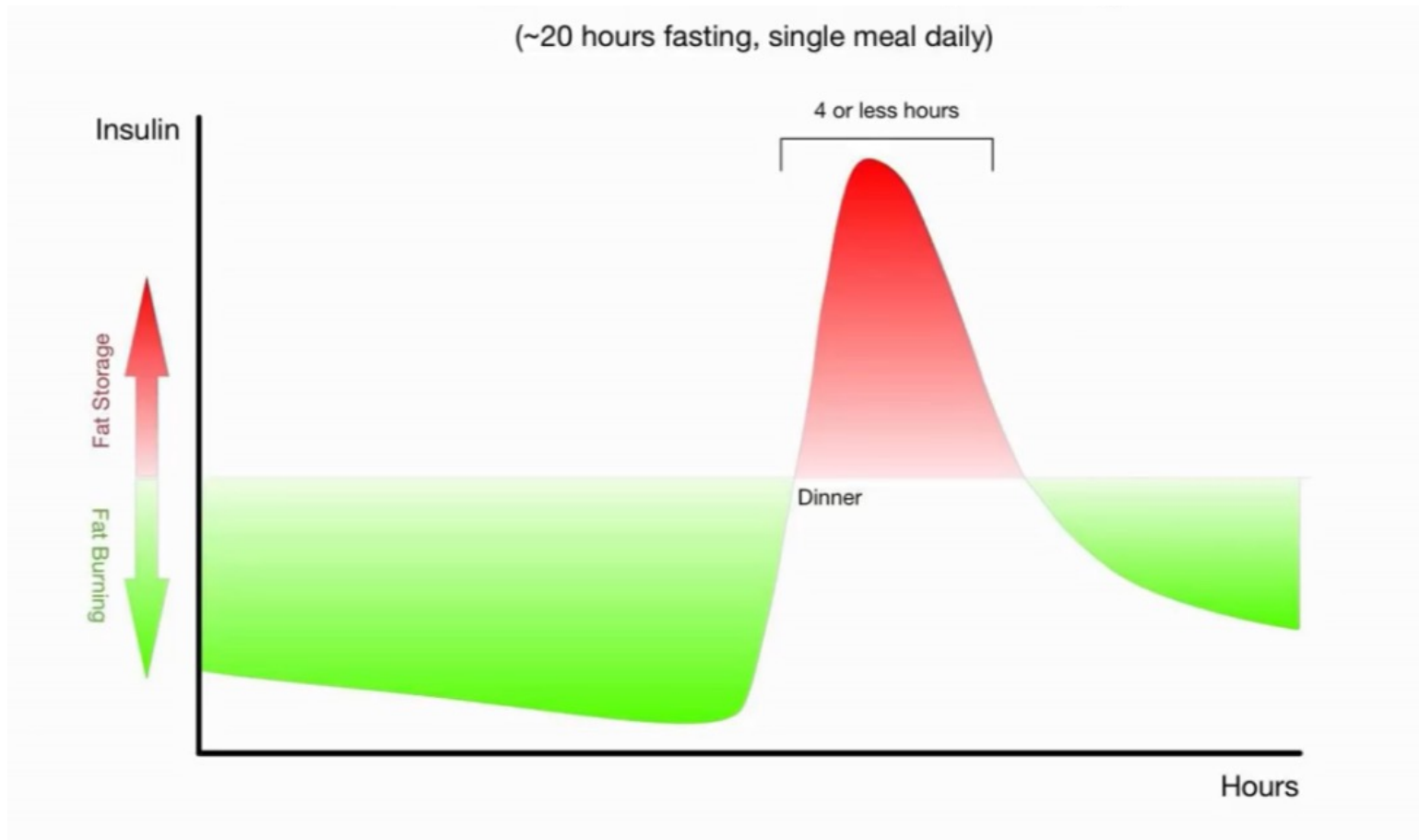


CARBS



'WARRIOR DIET' OR ALTERNATE DAY FASTING

FASTING



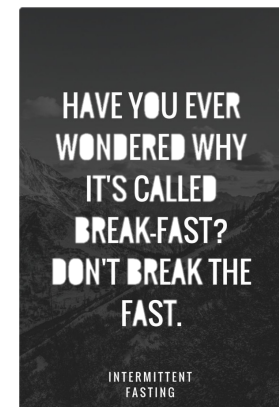
'WARRIOR DIET' MEAL PLAN: BREAKFAST

Bulletproof coffee/green tea

- a mixture of oil (MCT oil or coconut oil), fat (unsalted butter), and coffee/green tea to keep you fueled for the day.
- So, why drink Bulletproof Coffee? It gets your metabolism off to a great start, giving you a hunger-suppressing energy boost without having to consume as many calories as you normally would for breakfast.
- The medium chain triglycerides (MCT) and caffeine in the coffee will help increase your ketone levels, and the fats will help satiate you while giving you energy.
- Now, keep in mind that we are loading up with fats here. This means that consuming Bulletproof Coffee will technically break your fast. However, as long as the only calories you are getting are from fat, you will reap most (if not all) of the benefits of intermittent fasting.

Black coffee or green tea

- If you want to do a true fast, then you must not consume any calories at all during your fasting window. In other words, you would have to drink black coffee or green tea instead of Bulletproof Coffee.
- You will not be taking in any protein in the morning. You will need to keep this in mind as you plan your dinner, making sure you get enough protein.



'WARRIOR DIET' MEAL PLAN: LUNCH – WATER, TEA, & BLACK COFFEE

- It doesn't really matter what you drink as long as it doesn't have fats/protein/carbs in it. Caffeinated is fine, but keep in mind that too much caffeine later in the day will interfere with your sleep quality in such a way that your health and dieting progress will suffer.
- While intermittent fasting, aim to **drink a gallon of water a day (or 4 liters to be more precise)** and drink most of it in between "breakfast" and eating window.
- As your kidneys get used to processing the water, and your bladder gets used to the increase in the amount of water you're intaking – you won't have to go to the bathroom as much. It's good for you to do so, especially while you are adapting to keto.

'WARRIOR DIET' MEAL PLAN: DINNER

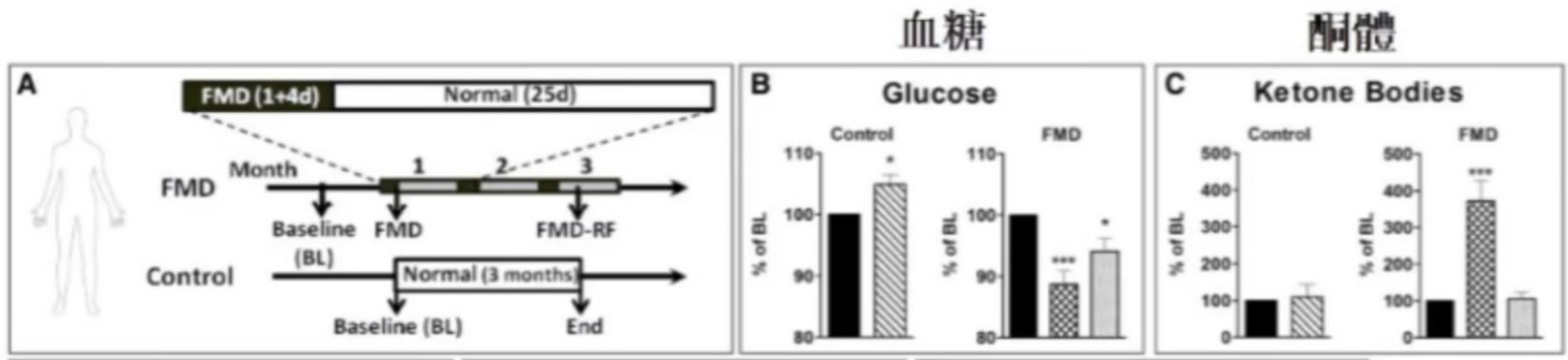
- Add cheese/butter/dressings/oils to bulk calories, if needed. We also must get that protein that our bodies need (and we haven't had for the entire day). Think lean meat or fish here. Chicken is great because it's high in protein and not too high in fat.
- Wait, wait, wait, but I thought this diet was high fat? Yes, it is – but we can get the fat from other sources.
- We can get fats from plenty of side items, sauces, dressings, and even straight from the spoon. If you need extra fats, just add more cheese, add a knob of butter, or make a side salad and dress it with a high-fat dressing and some olive oil.

'WARRIOR DIET' MEAL PLAN: SNACKS? NO SNACKS!

- **No snacking!** Well, you can snack, but try to stay away from it as much as you can. You want your body to stay in a fasting state until the beginning of your eating window. If you're snacking, then you will interrupt the process.
- That being said, you can snack on some nuts if you feel like you absolutely have to. If you do end up taking **a handful of nuts**, make sure that it's only once and not throughout the entire day.

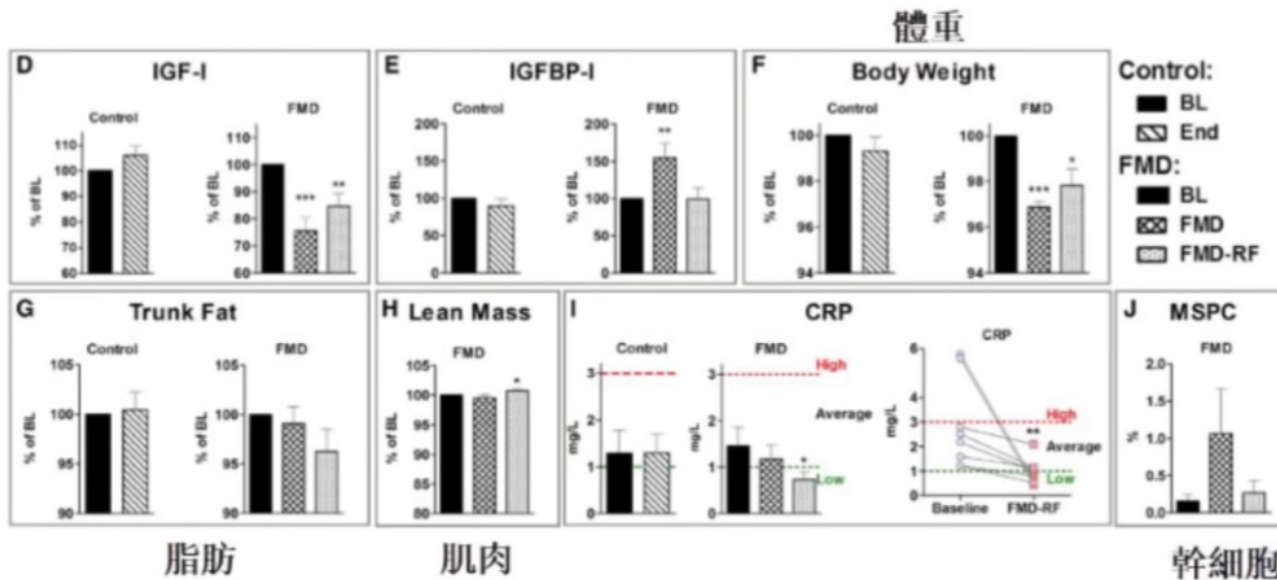
INTERMITTENT FASTING BIOMETRICS

Within three months, a five-day fasting meal once a month



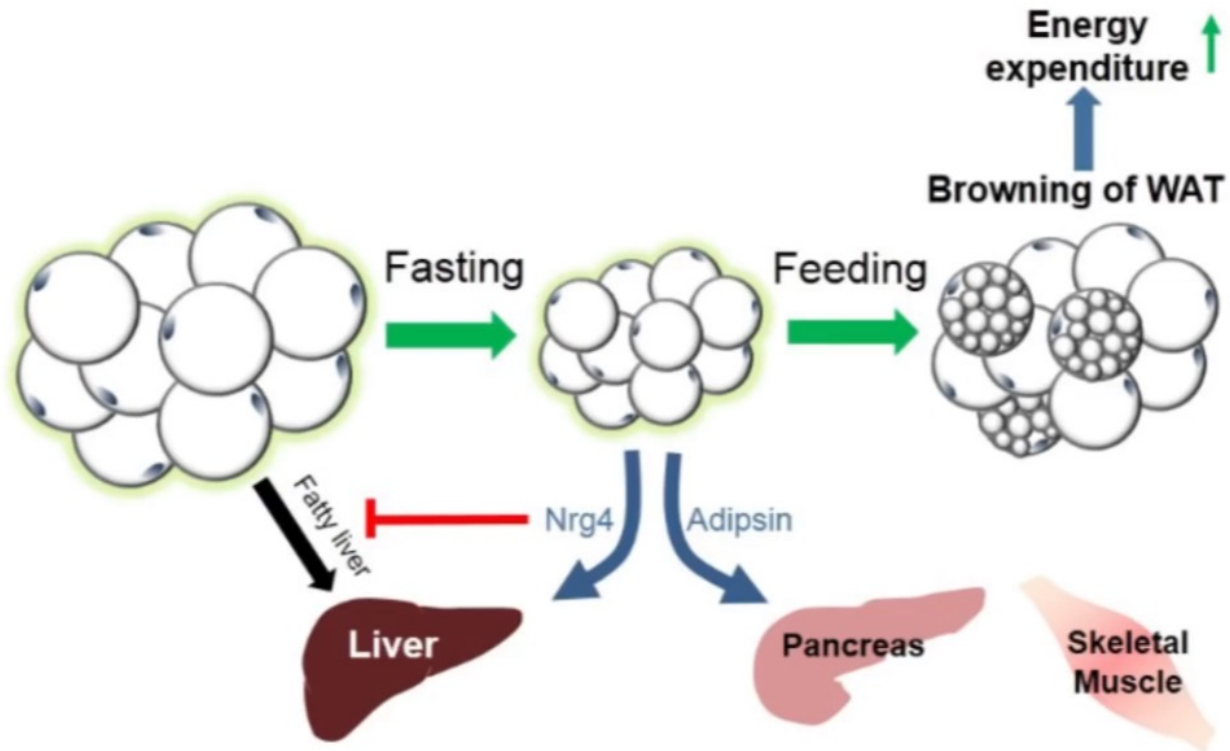
INTERMITTENT FASTING BIOMETRICS

Within three months, a five-day fasting meal once a month can reduce the indicators of various chronic diseases and improve metabolism



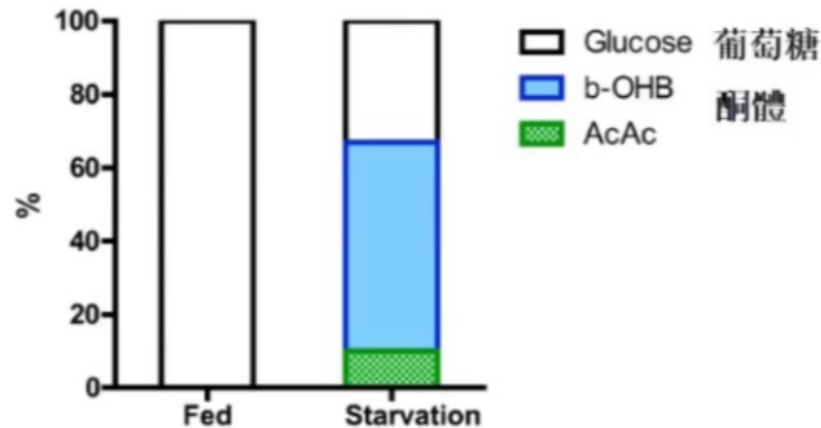
BIOEFFECTS OF FASTING

Fasting to exercise our fat



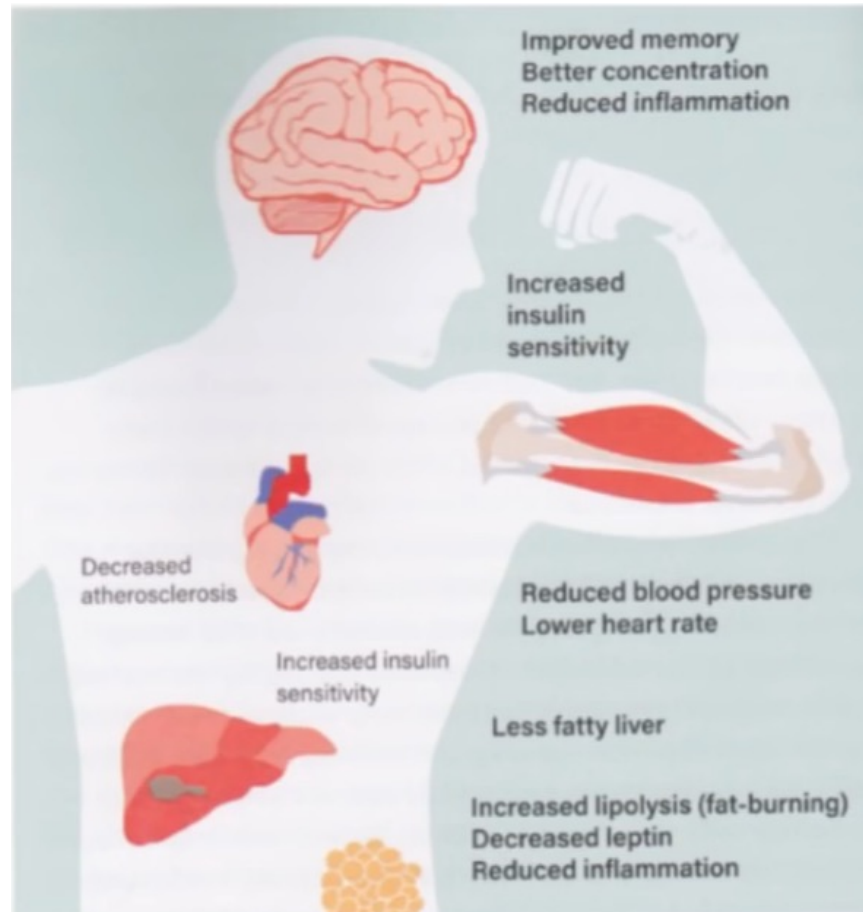
BIOEFFECTS OF FASTING

During fasting, brain cells will switch from using glucose to ketone bodies to produce cellular energy. Ketone bodies is the byproduct of the body breaking down fat for energy that occurs when carbohydrates intake is low



Longo & Mattson, Cell Metabolism (2014)

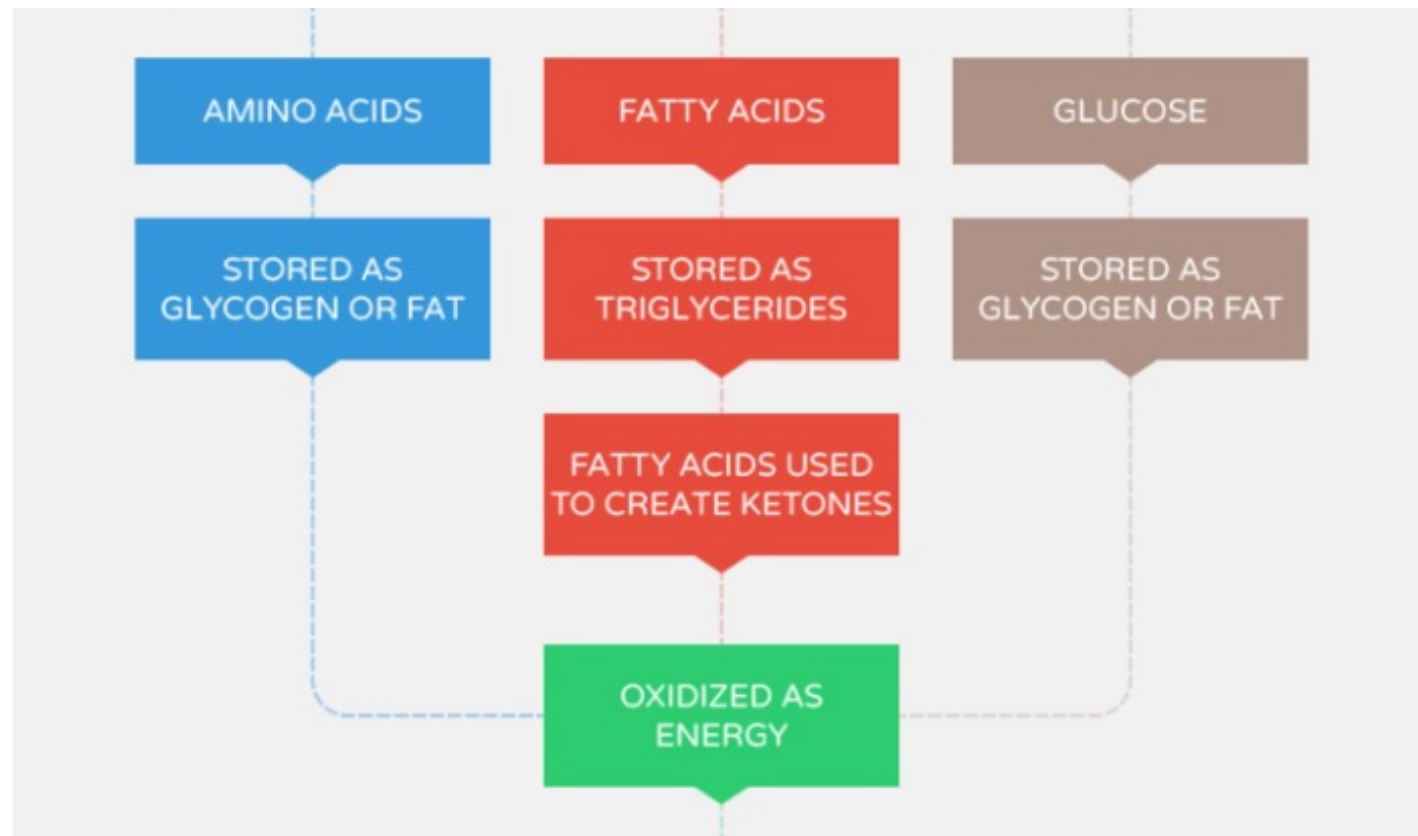
BIOEFFECTS OF FASTING



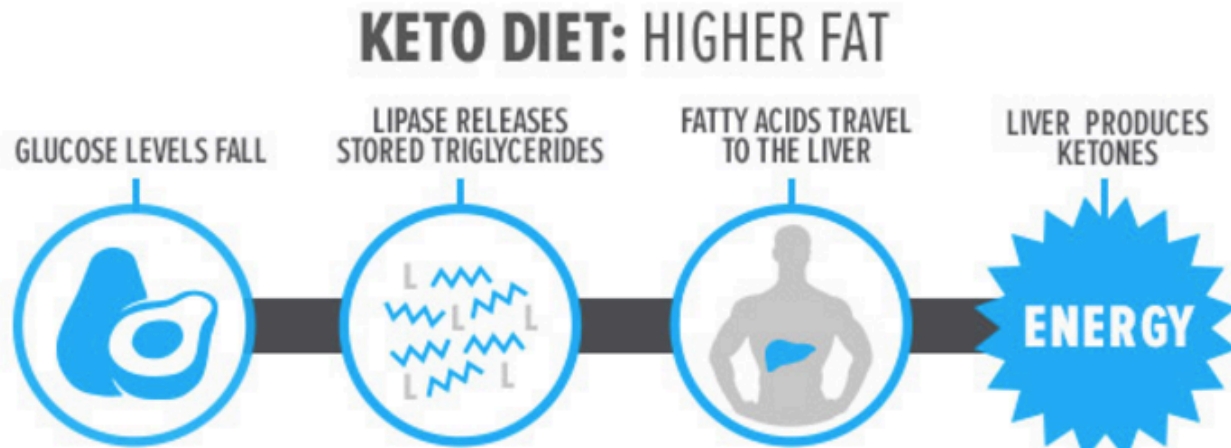
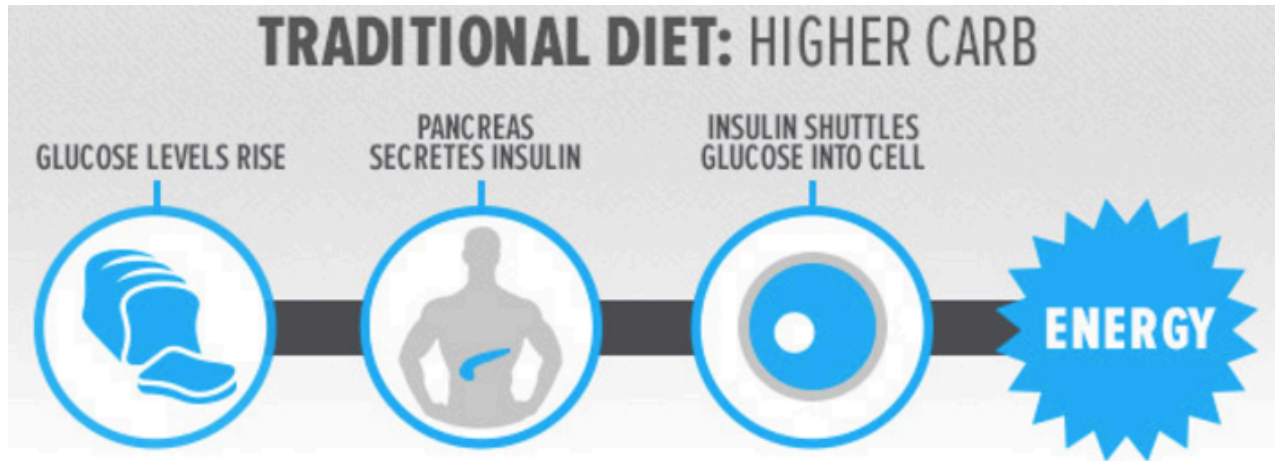
“The Complete Guide to Fasting” by Jason Fung and Jimmy Moore (2016)

HUMAN METABOLIC PATHWAYS

Our body has different metabolic pathways that it uses to provide energy for our cells. Among the others, **Glycolysis** (using sugar/**glucose** for fuel), **Gluconeogenesis** (turn the **amino acids** from protein into fuel) and **Lipolysis** (using **fat** for fuel through beta-oxidation) are the most well-known metabolic pathways.



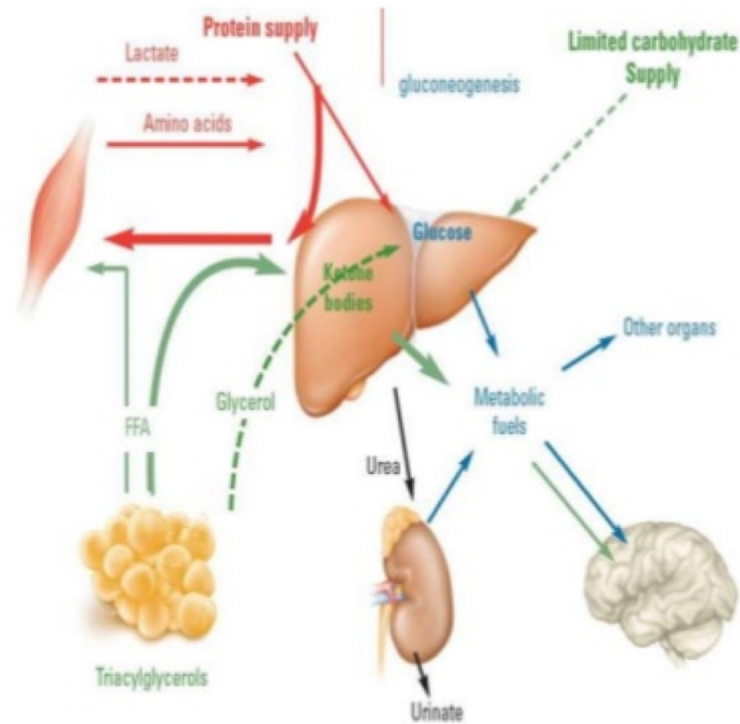
HUMAN METABOLIC PATHWAYS



HUMAN METABOLIC PATHWAYS

Metabolic Pathways: Ketogenic Diets

- Less glucose available , liver creates ketones.
- No hunger, and you burn fat for fuel.
- Muscle loss is minimal
- Blood Lipids improve
- Improvement in triglycerides to HDL
- Triglyceride/HDL ratio: 1.0



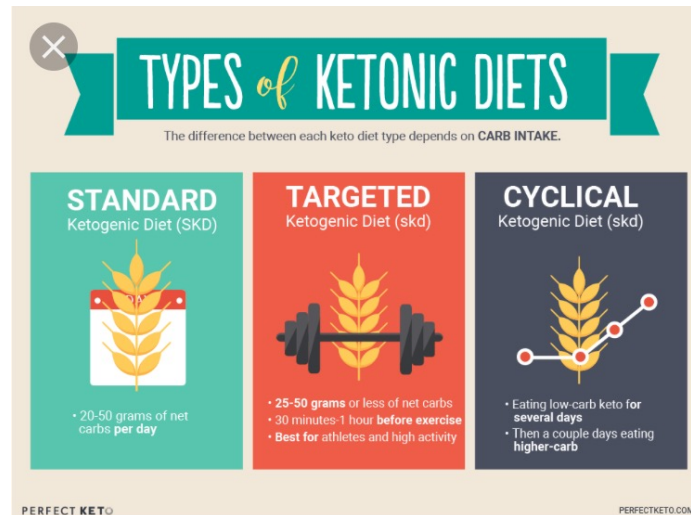
Physiological mechanism of phases 1-2 of the Eurodiet method



KETOGENIC DIET

KETOGENIC DIET AND KETOSIS

- A **ketogenic, or keto diet** is centered around the process of ketosis.



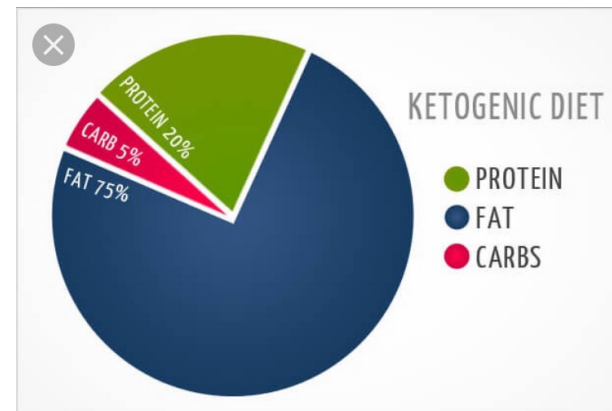
- **Ketosis** is a metabolic state where the body is primarily using **fat** for energy instead of **carbohydrates**. Burning carbohydrates (glucose) for energy is the default function of the body, so if glucose is available, the body will use that first.
- But during ketosis, the body is using **ketones** instead of **glucose**. This is a survival adaptation by the body for handling periods of **famine** or **fasting, extreme exercise**, or anything else that leaves the body without enough glucose for fuel.

KETOGENIC DIET AND KETOSIS

- **Ketone bodies** are released during ketosis and are created by the **liver** from **fatty acids**. These ketones are then used by the body to power all of its biggest organs, including the **brain**, and they have some other benefits for the body.
- Doctors originally developed the ketogenic diet to treat children with **epilepsy**. The "classic" ketogenic diet involves eating 3–4 grams (g) of fat for every 1 g of carbohydrate and protein. According to the Epilepsy Foundation, studies show that more than 50 percent of children who try the diet have half the number of seizures or fewer, while 10–15 percent become seizure-free.
- Doctors do not know why the ketogenic diet reduces some symptoms of epilepsy. Research suggests that this diet may also help with some other neurological disorders, such as **Parkinson's disease** and **Alzheimer's disease**.

KETOGENIC DIET

- Those eating a **ketogenic diet** purposely limit their carb intake (usually between 20 and 50 grams per day) to facilitate this response. That's why the keto diet focuses on **very low carb intake, moderate to low protein intake, and high intakes of dietary fats**. Lower protein is considered as important because it prevents the body from pulling lean muscle mass for energy and instead turns to fat.



- The diet represents a total turnaround from how most people eat, while the typical American diet is about 50 percent carbohydrate, 15 percent protein, and 35 percent fat, the breakdown on most typical keto diets is 5 to 10 percent carbs, 70 to 75 percent fat, and the rest from protein.

HEALTH BENEFITS OF KETOGENIC DIET

Weight loss and fat burning

- The keto diet are using fat as main fuel source, so it is burning fat stored within the body as well;
- It's satisfying and satiating due to the high fat and low carb intake, which can help one feel less hungry;
- Cutting out the refined carbs and sugars normally present in a traditional diet helps avoid spikes in blood sugar that can lead to the feeling of being hungry again soon after eating.

Type 2 diabetes

- In people who are insulin resistant due to the damaging effects of the Standard American Diet, a keto diet with proper diabetes management can be a remedy for restoring **insulin sensitivity** and normal metabolic function.



HEALTH BENEFITS OF KETOGENIC DIET

Neurological conditions

- Ketosis has been shown to help reduce seizures in people with **epilepsy**, especially kids. It may also have benefits for people with **Alzheimer's disease, Parkinson's, or other degenerative cognitive diseases** due to the neuro-protective effects of ketones and, likely, the rich nutrition of a ketogenic diet.

Brain performance

- There is some evidence suggesting that a keto diet can have benefits for productivity and mental performance, as well as **improving memory and mild cognitive impairment**.

Physical performance

- Becoming adapted to using fat for fuel, known as **keto-adaptation**, while on a keto diet can have benefits during physical activity. Those who engage in long periods of exercise may see benefits from ketosis because it helps the body burn fat for energy more quickly when the body has used up its glycogen stores.

SYMPTOMS OF KETOSIS

- For most people, ketosis is a **short-lived metabolic state** that happens when the body temporarily switches from burning glucose to burning fat. During this time, the level of ketones in the blood rises.
- Some people on ketogenic diets aim to spend more **extended periods in ketosis**. Some people also enter a state of ketosis through fasting.
- Ketosis can lead to **bad breath** and **weight loss**. It may also cause **headaches**, **thirst**, and **stomach complaints** in some people.

THEY ARE NOT THE SAME!

KETOSIS VS KETOACIDOSIS	
KETOSIS	KETOACIDOSIS
Low level of ketones in the blood	Extremely high level of ketones in blood
Normal process of the body	Can turn the blood acidic, deadly if untreated
Safe function of a low-carb, ketogenic diet	Occurs in diabetics who don't take enough insulin or aren't well, people who are starving, or alcoholics

DIABETIC KETOACIDOSIS (DKA)

Diabetic ketoacidosis (DKA) is an extreme **dangerous metabolic state** that is most commonly seen in people with type 1 diabetes and sometimes type 2 diabetics if they aren't properly managing their insulin and diet. With DKA, the ketone amount in the body is extremely high, leading the **blood** to **turn acidic**.

Causes of Ketoacidosis

DKA is one of the main causes of poor diabetes management (for both type 1 and type 2 diabetes, but especially type 1), including not getting enough or using the correct amount of **insulin**. DKA is also often the first sign someone has diabetes.

Other possible triggers for DKA include:

- Starvation combined with alcoholism
- An overactive thyroid
- Alcoholism
- Acute major diseases like pancreatitis, sepsis, or myocardial infarction
- Illness or infections like urinary tract infections and pneumonia
- Medications that may inhibit proper use of insulin
- Drug abuse
- Stress
- Heart attack

DIABETIC KETOACIDOSIS (DKA)

Ketoacidosis Symptoms

- Excessive urination
- Dehydration
- Extreme thirst
- Hyperglycemia
- Vomiting
- Nausea or stomach pain
- Shortness of breath or gasping
- Fruit-smelling breath (like pear drop sweets or nail varnish)
- Feeling overly tired
- Feeling confused

TESTING KETONE LEVELS

HOW TO Test YOUR KETONE LEVELS

When following the ketogenic diet, there are several ways to test for ketones in your body:



URINE TESTING

- **Urine strip** indicates ketones by color.
- Very affordable.
- Not always reliable.



BLOOD TESTING

- Glucose meter with **blood test** strip monitors ketones.
- Most accurate results
- Expensive.



BREATH TESTING

- Ketonix breath meter measures acetone (ketones) **on breath**.
- Most affordable option.
- Not most reliable.

TESTING KETONE LEVELS

When one is in ketosis, ketones that aren't used will spill over into different areas of the body: the breath, urine, and blood.

When a person is in **nutritional ketosis**, it is normal to have **blood ketone levels** of 0.5–3.0 millimoles per liter (**mmol/L**).

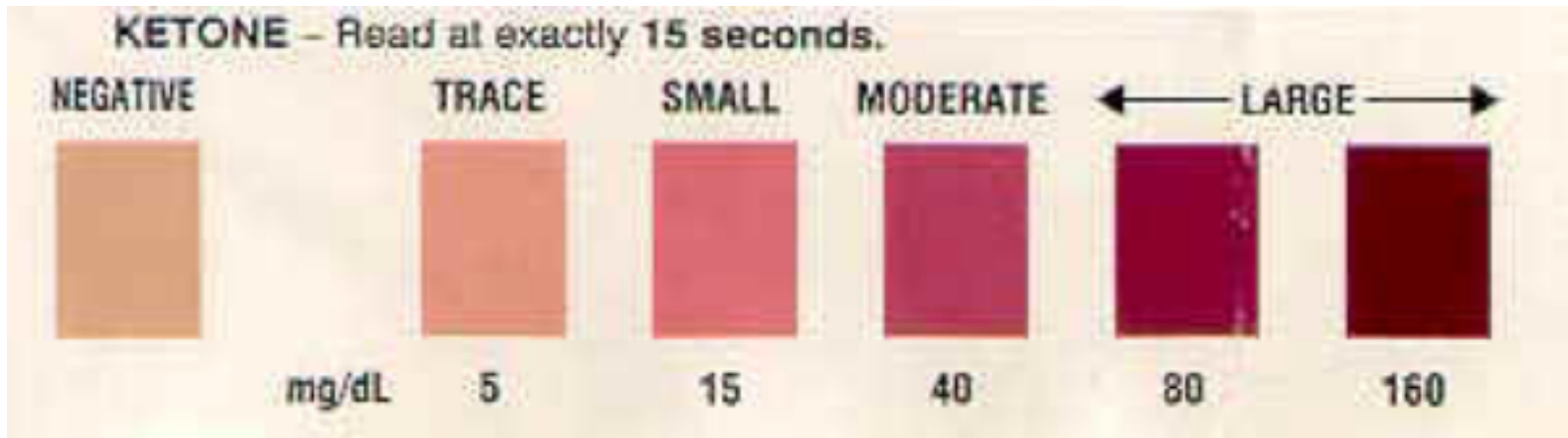
According to the American Diabetes Association, a person should check their ketone levels if their **blood glucose levels** are higher than **240** milligrams per deciliter (**mg/dl**).

TESTING KETONE LEVELS

Urine ketone strip measurements (AcAc):

Most urine ketone strips have the following color levels: trace(very small amount), small, moderate, large.

When urine ketone strips read as “moderate” or “large” means there's a chance one have DKA.



TESTING KETONE LEVELS

Blood ketone test

Ketone levels in a blood ketone test can range from zero to very high, levels are measured in millimoles per liter (mmol/L) and the general ranges include:

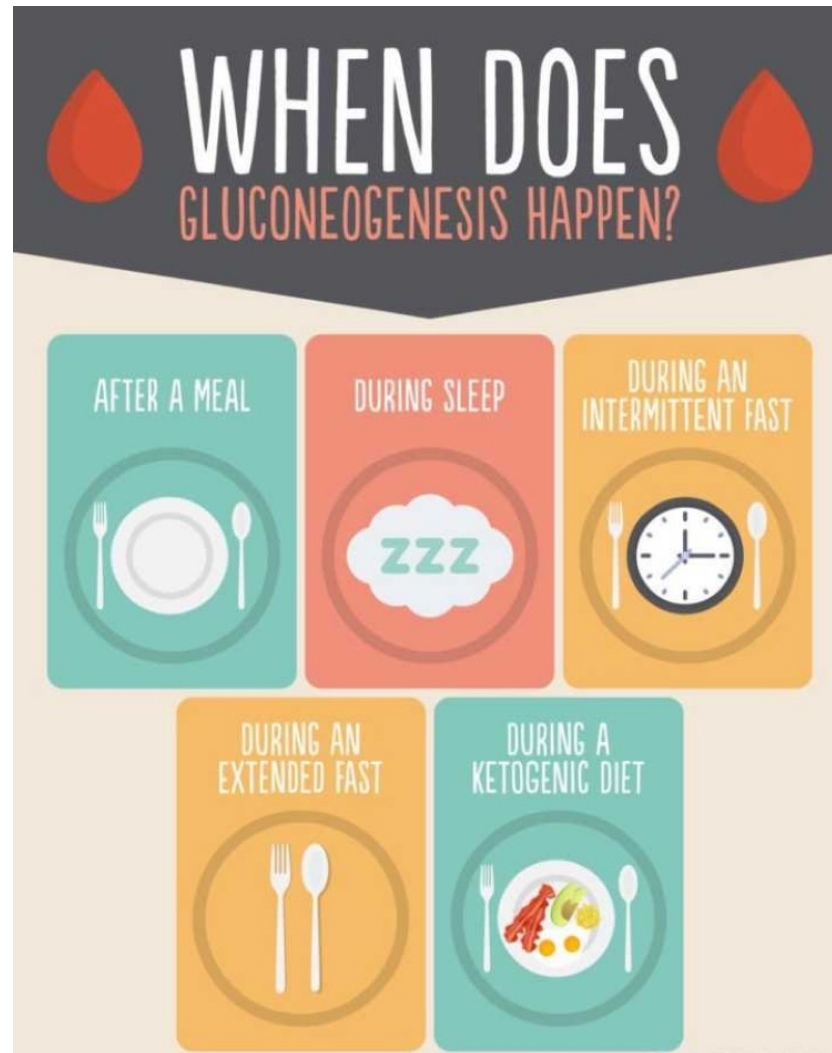
- Less than 0.6 mmol: **negative ketone level**
- Between 0.6 and 1.5 mmol: **low to moderate ketone level**
- Between 1.6 and 3.0 mmol: **high ketone level**
- Greater than 3.0 mmol: **very high ketone level**

The sweet spot for **weight loss** is **0.6 to 3.0 mmol/l**. This level of nutritional ketosis is recommended by researchers Stephen Phinney and Jeff Volek. Ketone levels during **diabetic ketoacidosis are 3-5 times higher** than the healthy ranges for nutritional ketosis.

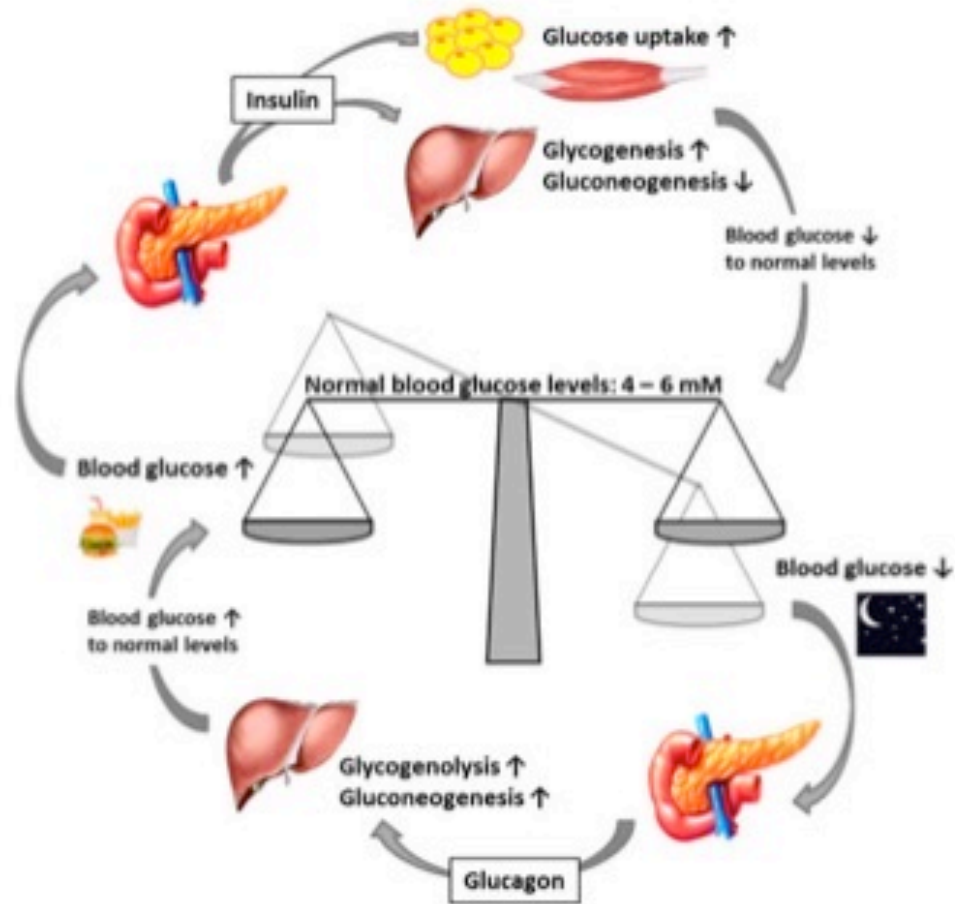
GLUCONEOGENESIS



GLUCONEOGENESIS



GLYCOGENESIS AND GLUCONEOGENESIS



GLUCONEOGENESIS — OUR LIVER’S “MAGIC TRICK”

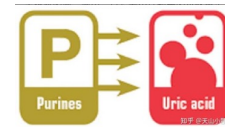
- If we are under some form of stress or consume excess protein, our liver will perform a magic trick called gluconeogenesis. This literally translates to “the making of (genesis) new (neo) sugar (gluco)”;
- During gluconeogenesis, the liver (and occasionally the kidneys) turns non-sugar compounds like amino acids (the building blocks of protein), lactate, and glycerol into sugar that the body uses as fuel. When glycogen (our body’s sugar storage) is low, protein intake is high, or the body is under stress, amino acids from our meals and our muscle become one of our main energy sources;
- If our body continues to convert amino acids into fuel, it can keep us from getting into ketosis. This is why some ketogenic dieters may experience an increase in body fat percentage and a decrease in muscle mass during their first couple weeks on the ketogenic diet.

ONE OF THE PROBLEMS WITH GOING KETOGENIC

- During the first three days of the ketogenic diet, stored glycogen and amino acids are the body's main fuel sources. At first, however, **glycogen** is the dominant fuel source. Once glycogen is almost all used up, amino acids from your food and our muscle become our main fuel source;
- But the body can't keep burning **amino acids** for fuel forever. We need them to perform many other functions that are necessary for our survival;
- For example, amino acids help build and **repair tissues like the hair, nails, bones, muscles, cartilage, skin, and blood. Many enzymes and hormones are made from amino acids** as well. In other words, using amino acids as energy for a long period of time is a bad idea;
- This is why the body has two other fuel sources — **fat and ketones** — that help preserve health and maintain muscle mass. The only problem is that the body doesn't use them right away.

WHEN DOES THE BODY USE KETOGENESIS INSTEAD OF GLUCONEOGENESIS?

- In a review of multiple fasting studies, researchers found that it takes **between 18 and 24 hours to deplete glycogen stores** and **more than 2 days after that for the body to shift into ketosis**;
- That's two days without glycogen or ketones for fuel! How is the body fueling itself during that time? With gluconeogenesis;
- In the studies, there was a **significant increase in urinary nitrogen loss from day 1 to day 3 of fasting**, which was **followed by a steady decrease**;
- These findings suggest that the rate at which we use gluconeogenesis decreases after the third day of fasting. Variations occur, however, when we look at the time it takes for different people to shift from gluconeogenesis to ketogenesis as the dominant metabolic pathway.



FROM GLYCOLYSIS TO GLUCONEOGENESIS TO KETOGENESIS

The path to ketogenesis can be summarized in three stages:

Stage 1 : The postabsorptive phase — 6 to 24 hours of fasting

During this phase, most energy is provided by glycogen.

Stage 2 : The gluconeogenic phase — 2 to 10 days of fasting

During this phase, glycogen is depleted and gluconeogenesis takes over to provide the body with energy. The window of time for this phase is so broad (2 to 10 days) because it depends on who is fasting. If you are a healthy male or obese, it will take longer for you to get to stage 3.

Stage 3 : The protein conservation phase — after 3 to 10 days of fasting

This phase is characterized by a decrease in protein breakdown for energy and an increase in fat and ketone use. Although this phase as described occurring after 10 days of fasting, many people enter this stage after 3 days of fasting.

There you have it — the three stages that everyone goes through before reaching ketosis. **Whether we are fasting from carbohydrates (the ketogenic diet) or fasting from all food, we will go through these stages as well.**

KETO-ADAPTATION



WHAT YOU SHOULD KNOW ABOUT KETO-ADAPTATION

- A ketogenic diet is an eating plan that's designed to seriously minimize carbohydrates, your body's favorite fuel source, and dramatically increase fats. The idea is that as carbohydrate levels drop, the body becomes forced to burn stored fat as its primary source of fuel, which can result in often **dramatic weight loss**;
- The "keto" part refers to ketones, which are water-soluble molecules that the liver makes when metabolizing fats, particularly when carbohydrate intake is low. Ketones can be used for energy by most tissues in your body, including the brain, which can't use unrefined fats as fuel.

WHAT YOU SHOULD KNOW ABOUT KETO-ADAPTATION

- Our body is always using a mix of fat and glucose for energy, but in a non-keto-adapted state, it reaches for glucose first, since only low amounts of ketones are normally generated during fat metabolism and some tissues of the body—for example, the heart—prefer using ketones when they're available. The brain can't use fat, so it depends on glucose when we're in a non-keto-adapted state.
- If glucose is the body's normal go-to source of energy, you may be wondering what happens when it suddenly doesn't have enough to use as its main fuel.
- **Keto-adaptation** (also sometimes called fat-adaptation) is the process your body goes through on the diet as it **changes from using primarily glucose for energy to using primarily fat.**

GETTING TO A KETO-ADAPTIVE STATE

- Once stores of glycogen (the way the body warehouses glucose) become depleted, your brain and other organs begin the process of adapting to using fats and ketones instead of glucose as its main fuel. But reaching ketosis, the state in which fat provides most of the fuel for your body, isn't usually a pleasant experience;
- The extreme carb restriction is often accompanied by adverse side effects. Commonly known as the "keto flu," the transition may cause a period of **fatigue, weakness, lightheadedness, "brain fog," headaches, irritability, muscle cramps, and nausea.**



GETTING TO A KETO-ADAPTIVE STATE

COMMON KETOSIS SIDE EFFECTS	
INITIAL NEGATIVE SIDE EFFECT	REMEDY
Stomach Pain	Hydrate & Electrolytes
Low Energy	Time
Brain Fog	Consume More Fat
Rationalization	Mental Strength

	STAY VERY HYDRATED
	INCREASE SALT INTAKE
	EAT MINERAL RICH FOODS
	SUPPLEMENT WITH MAGNESIUM
	TAKE EXOGENOUS KETONES
	GENERAL SELF-CARE

GETTING TO A KETO-ADAPTIVE STATE

- While the length of time it takes to adapt to a keto diet varies, the process begins after the first few days. Then, after about 3 to 10 days, many low-carbers suddenly start to feel the positive effects of keto-adaptation. They report improved mental concentration and focus and more physical energy as well.
- By the end of the first week (sometimes up to two weeks), the body has usually accomplished the majority of its work in adapting to using fat for energy. By this point, hunger and food cravings are diminished and stamina and vitality increased.
- After this, the body continues to make more subtle changes. For example, it gradually becomes more conserving of protein, so people often crave less protein. Another change that athletes often notice is less lactic acid buildup in their muscles with long training sessions, which translates into less fatigue and soreness. It can take up to 12 weeks for these changes to occur and for you to fully reach ketosis.

HELPING YOUR BODY ADAPT

There are a number of ways you can get over the hurdle of the first 3 to 10 days of carbohydrate withdrawal:

- **Eat lots of fat and fiber.** The fuller you feel, the less likely you are to miss your favorite carb-laden foods. Foods made with flaxseeds are high in both fiber and healthy omega-3 fats.
- **Increase salt and water intake.** Many of the negative side effects are caused by a loss of fluid and electrolytes like sodium (carbs hold on to water, so you'll probably **urate** a lot more once you cut them out). To replenish both, drink a cup of water with a half teaspoon of salt stirred into it or a cup of bouillon several times a day for a few days.
- **Go easy with physical activity.** As you adapt to a new fuel source, strenuous workouts can further stress your body, so stick to gentle forms of exercise like walking and stretching for a few weeks.



OTHER CHANGES TO EXPECT

- Research so far shows that **ketogenic diets** (and low-carb diets in general) can **reverse** the signs of **metabolic syndrome**, **type 2 diabetes**, and **polycystic ovarian syndrome (PCOS)**. Keto diets are also successfully used to **treat some seizure disorders**, and studies indicate they may **help other neurological disorders**, such as **Parkinson's disease**, though more research is needed.
- The more scientists look at the keto diet, the more positive benefits they seem to find. For example, people on these diets have **less of the saturated fat in their blood** that's linked to insulin resistance, metabolic syndrome, and heart disease. Emerging research also shows that using ketones for energy may **decrease oxidative stress and inflammation** on the body, and may even be involved in turning on some genes that may be beneficial to health.

MANAGING KETO-ADAPTATION

- Some people find that their ketosis is pretty stable as long as they eat a **low-carb diet under about 50 grams of carbs a day**, while others find they need to eat fewer carbs to stay in ketosis. Athletes and heavy exercisers often can eat more than 50 grams of carbs and still stay in ketosis. Other influences, such as hormonal fluctuations and stress, have been known to throw people out of ketosis.
- Some people find value in **measuring** their **blood ketones**, which can be done at home using a special meter and test strips.

ARTICLE SOURCES

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- Phinney SD, Horton ES et al. "Capacity for Moderate Exercise in Obese Subjects after Adaptation to a Hypocaloric, Ketogenic Diet." *Journal of Clinical Investigation* 1980 66(5): 1152–1161.
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- Volk BM, Kunces, LJ, et al. Effects of Step-Wise Increases in Dietary Carbohydrate on Circulating Saturated Fatty Acids and Palmitoleic Acid in Adults with Metabolic Syndrome. *PLoS One*. 2014 9(11).
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Mindfulness In Biz

(慈善機構)

Three-Day Fasting Programs

May 21, 2019

Preliminary Observations

*This report is prepared by EL, PhD
Volunteer Consultant, Mindfulness In Biz
Over 20 years experience in global clinical research and development*

Three-Day Fasting Programs

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- A total of 39 registered subjects was included in a three-day Gao fasting program organized on May 11 to 13, 2019.
- Blood pressure, blood sugar level, body weight and other relevant parameters were measured on Day 1 and Day 3 of the program.
- Thirty-nine (39) subjects returned their measurements
- This report includes the preliminary observations obtained from the Intermittent and Water Fasting April programs and the Gao Fasting May program.

Baseline Characteristics

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Characteristic	Intermittent Fasting Group N= 12	Water Fasting Group N= 18	Gao Fasting Group N=39
Age range			
30-40 year - no. (%)	0 (0)	3 (17)	3 (8)
40-60 year - no. (%)	11 (92)	12 (66)	27 (69)
60-80 year - no. (%)	1 (8)	3 (17)	8 (20)
81-90 year - no. (%)	0 (0)	0 (0)	1 (3)
Male - no. (%)	5 (42)	4 (22)	8 (20)
Body-mass index kg/m ² - median [range]	23.3 [18.4 - 35.6]	24.4 [18.0 - 39.4]	23.3 [12.9 - 34.3]

Body Mass Index (BMI) Baseline

Obesity Classification, Asia Pacific Guidelines

Underweight: $<18.5 \text{ kg/m}^2$

Normal: $18.5 \text{ to } 22.9 \text{ kg/m}^2$

Overweight: $23 \text{ to } 24.9 \text{ kg/m}^2$

Obese: $\geq 25 \text{ kg/m}^2$

*Reference: Lim JU et al. Int J COPD 2017;12:2465-2475

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Mindfulness In Biz
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Blood Pressure Observations Intermittent Fasting Group

Normal Blood Pressure*

SBP <120 mmHg

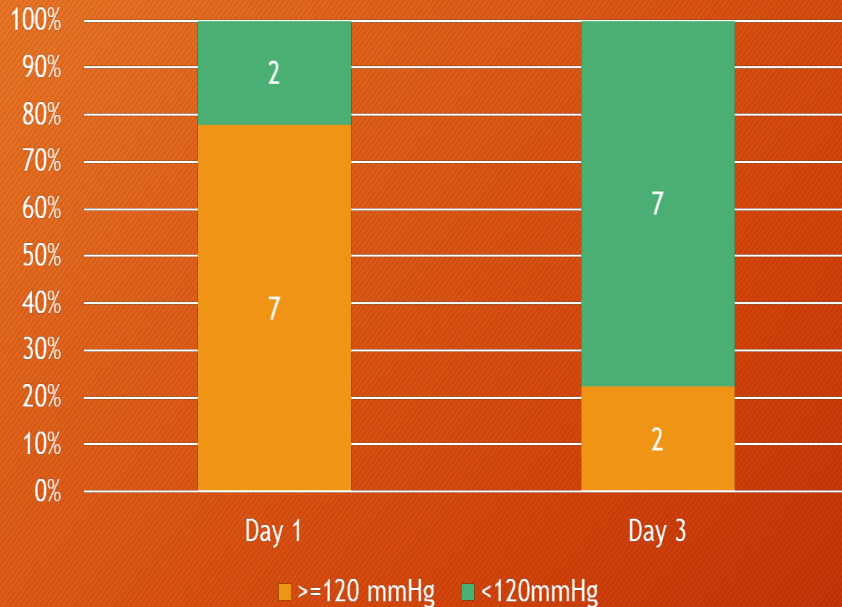
DBP <80 mmHg

* Reference: 2019 ACC/AHA

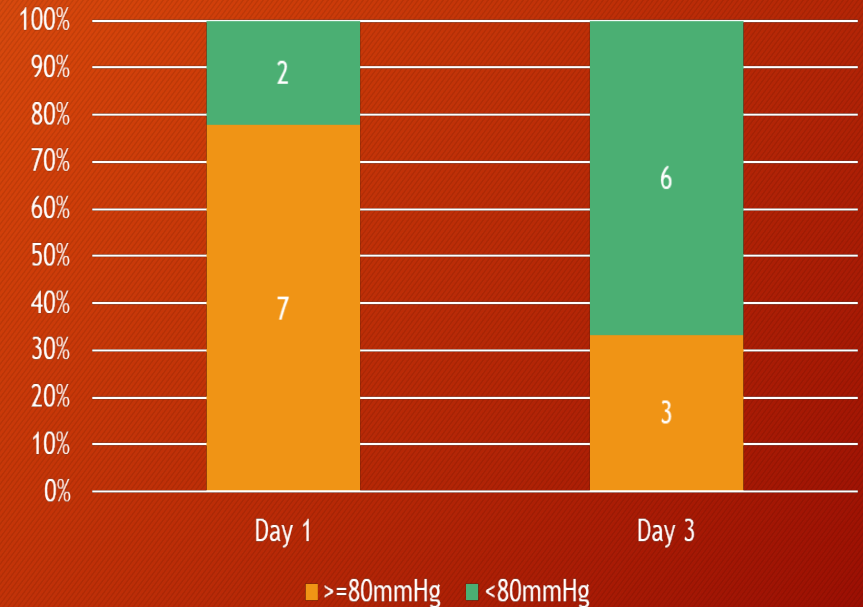
Guideline

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Systolic Blood Pressure (SBP), n=9



Diastolic Blood Pressure (DBP), n=9



Blood Pressure Observations Water Fasting Group

Normal Blood Pressure*

SBP <120 mmHg

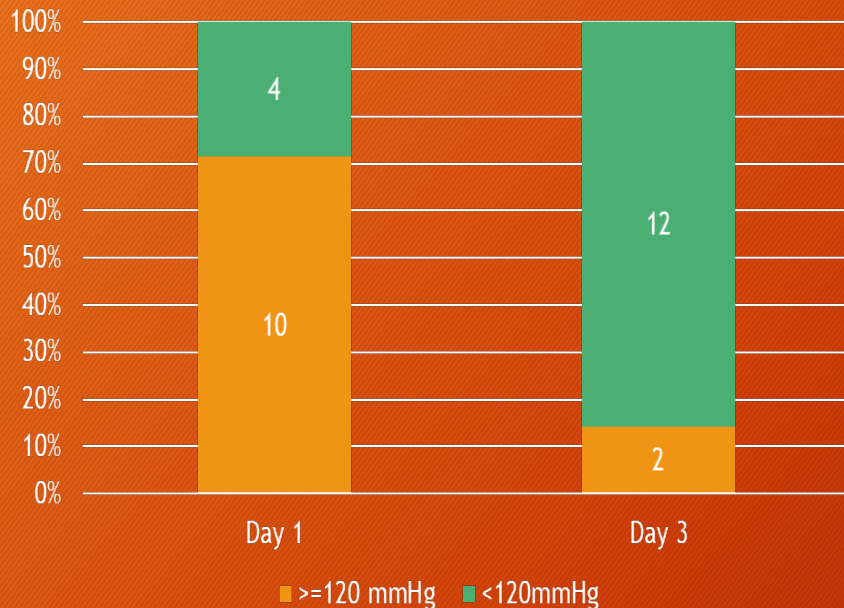
DBP <80 mmHg

* Reference: 2019 ACC/AHA

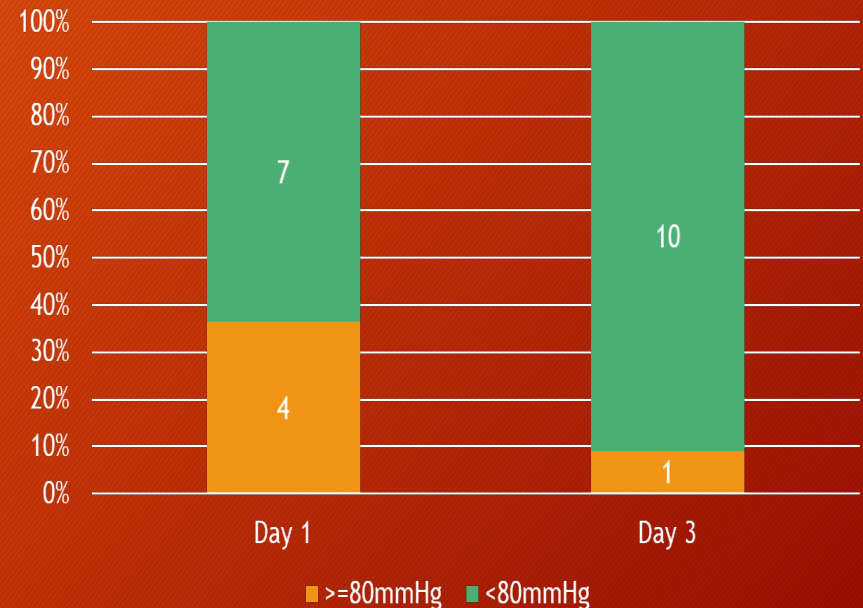
Guideline

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Systolic Blood Pressure (SBP), n=14



Diastolic Blood Pressure (DBP), n=11



Blood Pressure Observations Gao Fasting Group

Normal Blood Pressure*

SBP <120 mmHg

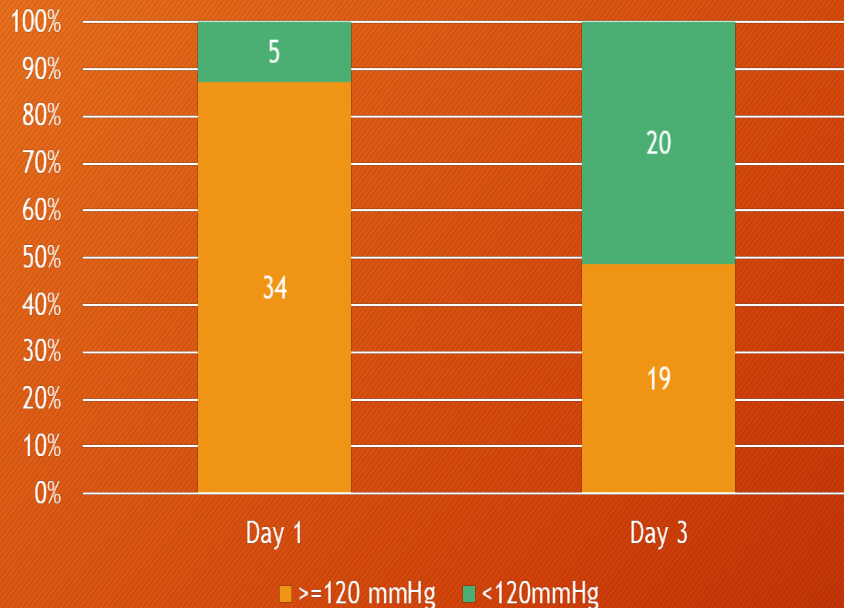
DBP <80 mmHg

* Reference: 2019 ACC/AHA

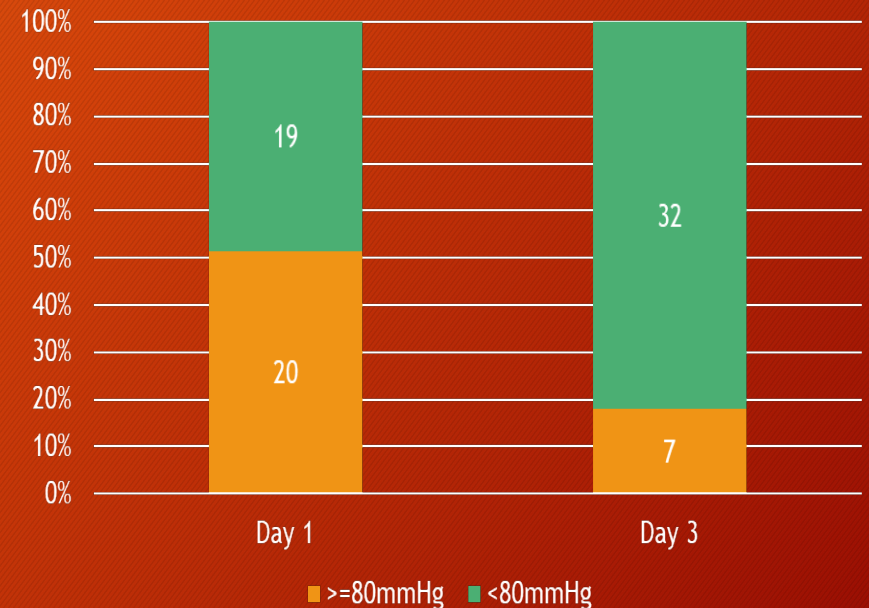
Guideline

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Systolic Blood Pressure (SBP), n=39



Diastolic Blood Pressure (DBP), n=39



Blood Sugar Intermittent Fasting Group

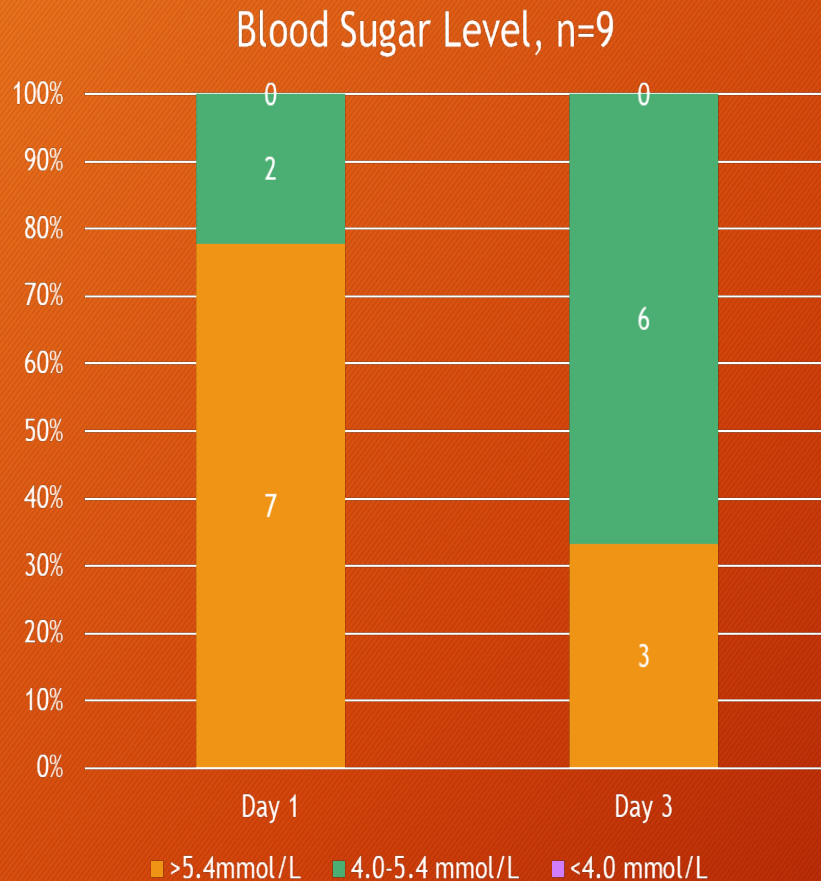
Normal Blood Sugar Level*

Between 4.0 - 5.4 mmol/L when fasting

Up to 7.8 mmol/L two (2) hours after eating

* Reference: 2018 NICE Public Health Guideline

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Blood Sugar Water Fasting Group

Normal Blood Sugar Level*

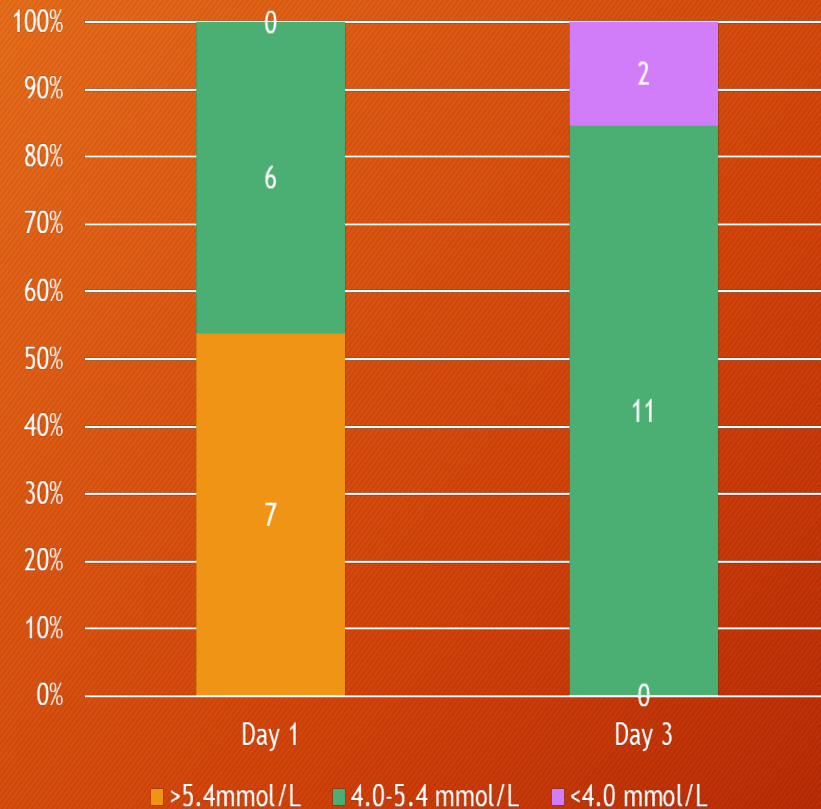
Between 4.0 - 5.4 mmol/L when fasting

Up to 7.8 mmol/L two (2) hours after eating

* Reference: 2018 NICE Public Health Guideline

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Blood Sugar Level, n=13



Blood Sugar Gao Fasting Group

Normal Blood Sugar Level*

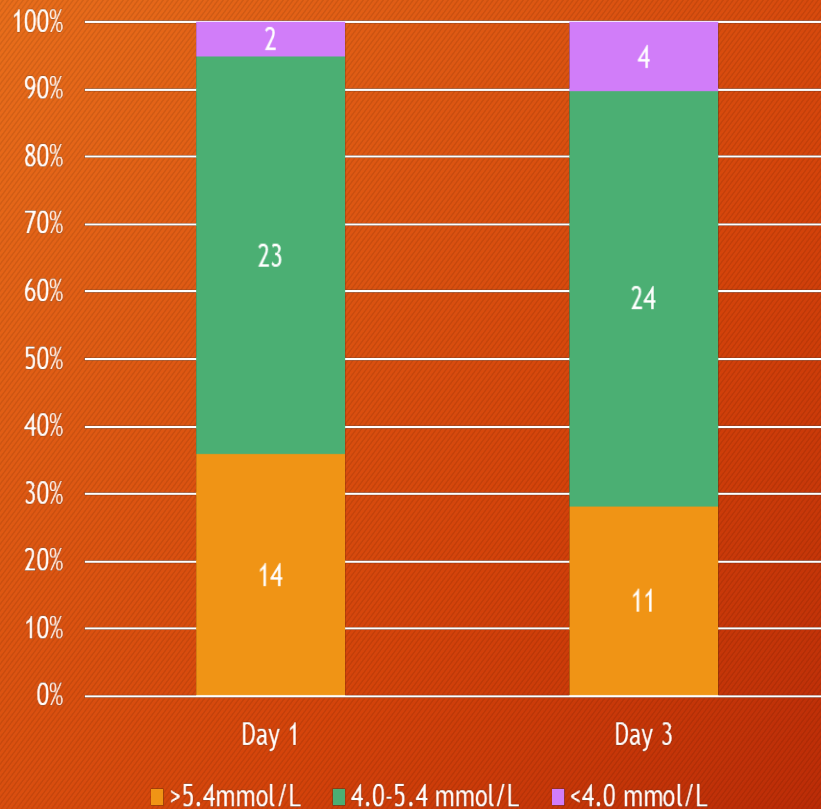
Between 4.0 - 5.4 mmol/L when fasting

Up to 7.8 mmol/L two (2) hours after eating

* Reference: 2018 NICE Public Health Guideline

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Blood Sugar Level, n=39

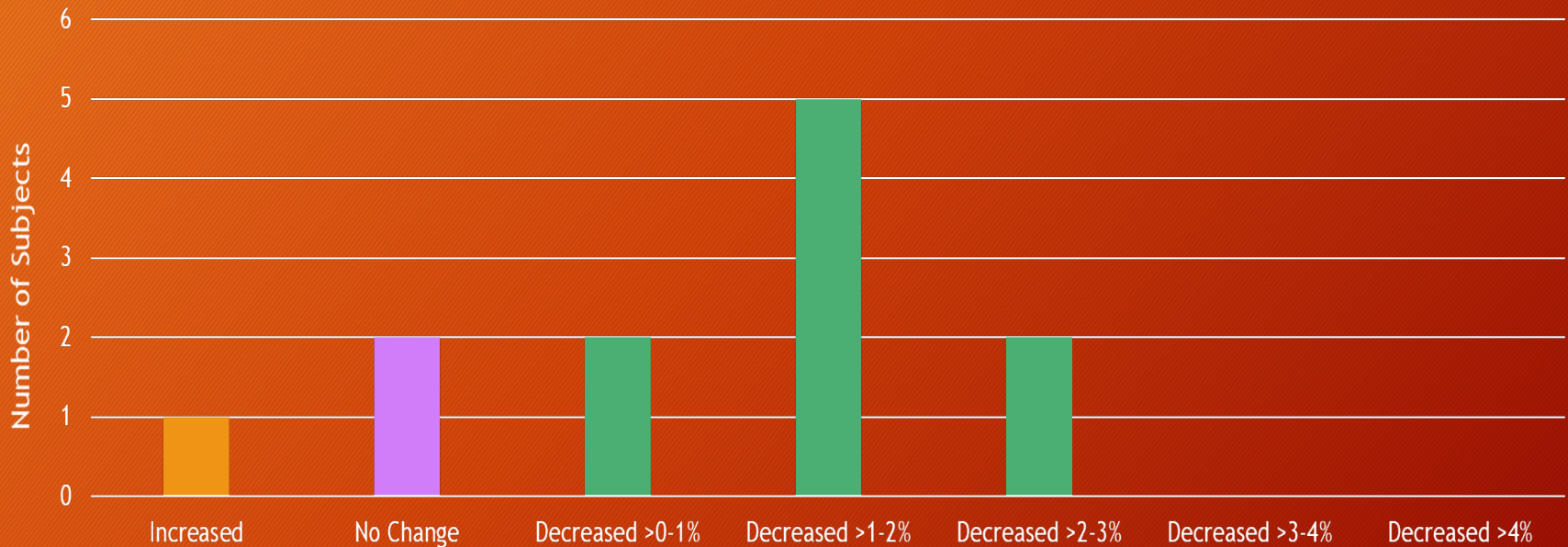


Changes in Body Weight

Intermittent Fasting Group

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Changes in Body Weight, n=12

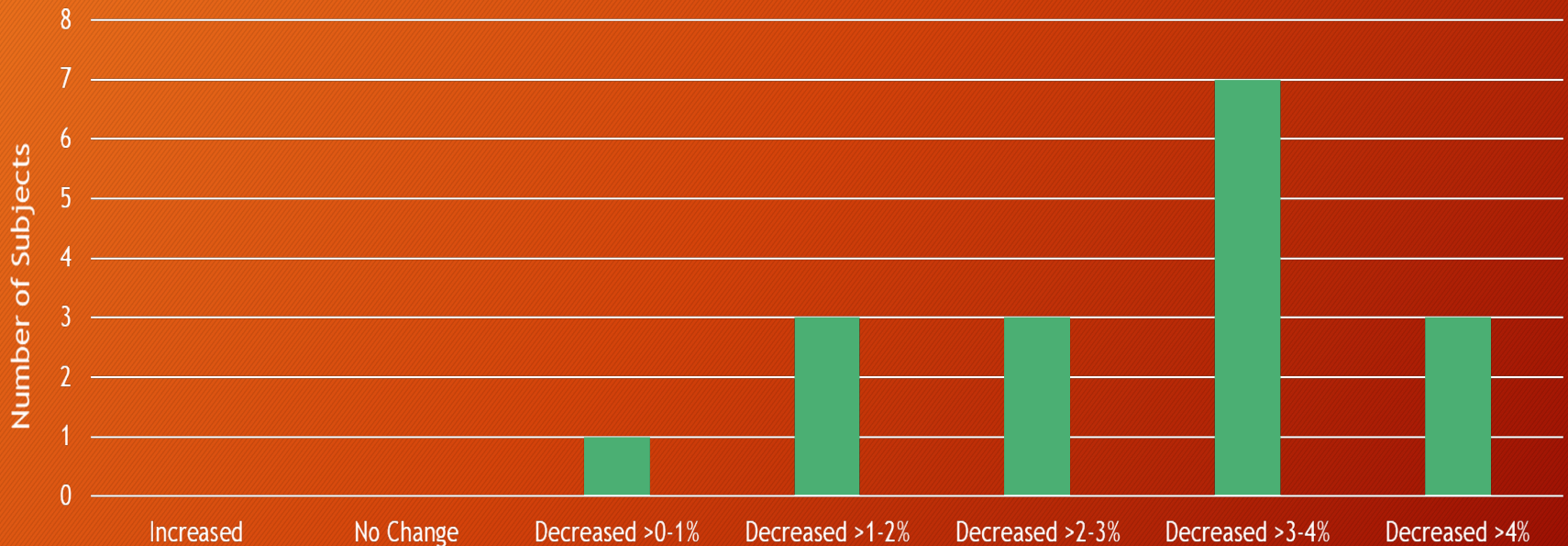


Changes in Body Weight

Water Fasting Group

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Changes in Body Weight, n=17

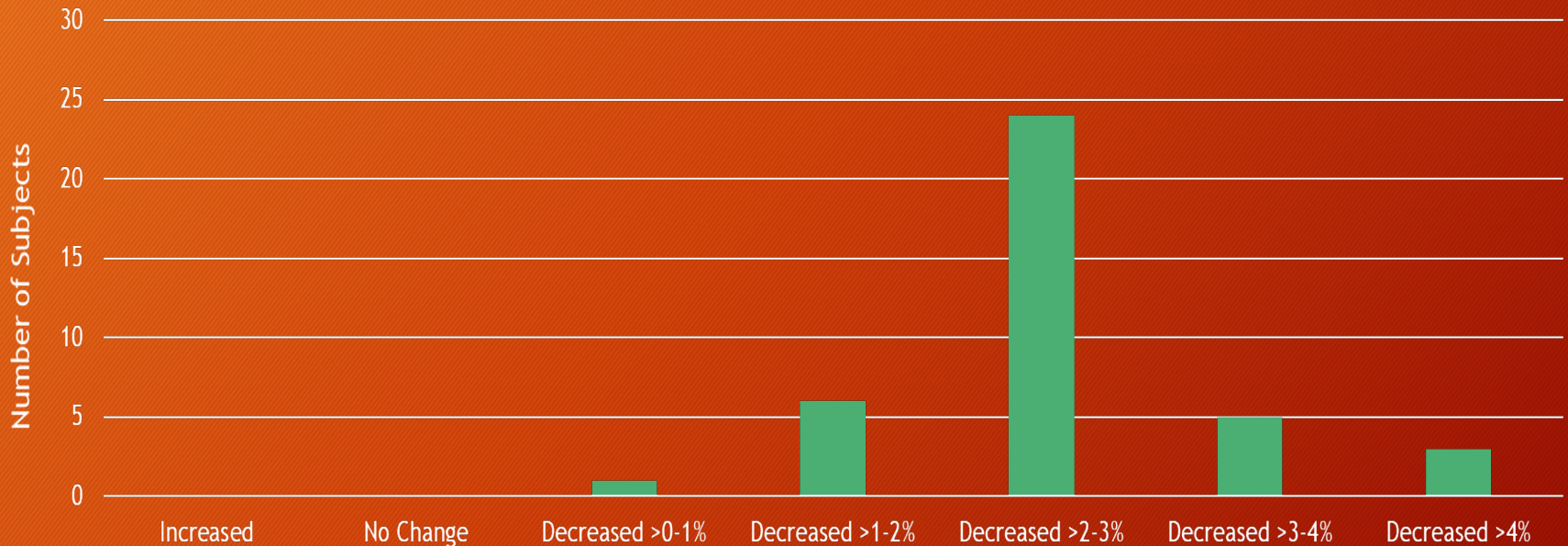


Changes in Body Weight

Gao Fasting Group

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Changes in Body Weight, n=39



Summary

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- In both the Intermittent and Water Fasting Groups, the following was observed:
 - Majority of the subjects was in the age range of 40-60 years
 - More (majority) subjects in the normal blood pressure range*, SBP<120 mmHg and DBP<80mmHg, on Day 3 vs. Day 1
 - More (majority) subjects in normal blood sugar level range**, between 4.0-5.4 mmol/L when fasting, on Day 3 vs. Day 1
 - % decrease in body weight on Day 3 from Day 1 was higher in the Water Fasting Group when comparing with that in the Intermittent Fasting Group.

*References: *, 2019 ACC/AHA Guideline; **, 2018 NICE Public Health Guideline

Further Thoughts

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- Increase sample size
- Include the following, if possible:
 - Age (on Day 1 measurement)
 - Medical history (for e.g. Hypertension, Diabetes, Hyperlipidemia, Atrial Fibrillation, CAD, etc.)
 - Medication
 - Waist circumference
- Ratio of male : female participants
- Standardize blood pressure, blood sugar/glucose, body weight and body height measurements (for e.g. time, frequency, method and number of the measurements)
- Consider monthly programs (for e.g. 3-day fasting each month) and the changes over time (for e.g. 3 months); may ask participants to complete a monthly questionnaire