

# The Science of Fasting



THE FASTING BOOST  
Method

# Welcome

Welcome to The Fasting Boost Method.

We hope you are as excited as we are!

We're here to break it all down for you, so you can start today if you'd like!

At Fasting Boost we do not consider this method of eating a diet. It's a way of eating that restricts calories, but that can also ultimately grow into a way of life.

We hope you take advantage of this course and make the most out of it.

Good luck on your fasting journey!





LEVEL



# DISCLAIMER

THE FASTING BOOST  
Method



## DISCLAIMER

**DO NOT STAR WITHOUT A DOCTOR'S CONSENT IF YOU HAVE MEDICAL ISSUES.**

If you have medical issues, consult a physician about how intermittent fasting could affect you.

Gradual weight loss through intermittent fasting provides significant benefits for the vast majority of people, and there is a slight possibility that you don't belong to that vast majority.

**DO NOT SUFFER THROUGH A REGIMEN THAT DOESN'T SUIT YOU.**

Regulate your intermittent fasting schedule continuously until you find the perfect dietary routine. If you feel that it is hard to tolerate prolonged fasting, don't hesitate to shorten the period.



# DISCLAIMER

While intermittent fasting has many proven benefits, it's still controversial.

**DISCUSS ANY CHANGES IN  
MEDICATION AND RELEVANT  
LIFESTYLE CHANGES WITH  
YOUR DOCTOR.**



# WHO SHOULD NOT FAST?

This guide is written for adults with health issues, including obesity, that could benefit from intermittent fasting.

You should not do intermittent fasting if you are:

- Underweight (BMI < 18.5) or have an eating disorder like anorexia.
- Pregnant - you need extra nutrients for your child.
- Breastfeeding - you need extra nutrients for your child.
- Under 18 - you need extra nutrients to grow.



LEVEL



# PRE CAUTIONS



# PRECAUTIONS

## PAY ATTENTION TO HOW YOUR BODY FEELS.

### Increased Stress

Anxiety or depression,  
mood swings



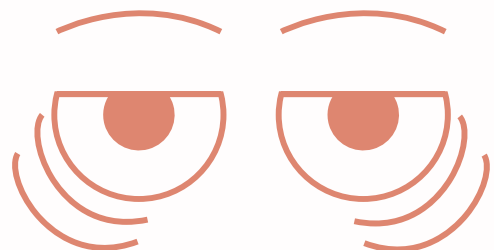
### Monitor Your Body

Loss of sex drive, hair loss,  
muscle pain



### Trouble Sleeping

Trouble falling or staying  
asleep



# Intermittent Fasting Symptoms

If after doing any mentioned intermittent fasting protocols you find yourself experiencing the following symptoms:

Bloating; Depressed mood; Fatigue; Headaches; and Irregular menstrual cycle...then it's time to stop that particular protocol you're doing.

After a couple of weeks of gone back to normal, shift to a lighter version of intermittent fasting, essentially, an intermittent fasting approach where you don't fast on consecutive days until you feel ready again.



# What if I Take Medications?

There are certain medications that may cause problems on an empty stomach. Aspirin can cause stomach upset or even ulcers. Iron supplements may cause nausea and vomiting.

Metformin, used for diabetes, may cause nausea or diarrhea.

Also, you can try taking your medications with a small serving of leafy greens.



Please discuss whether or not these medications need to be continued with your physician.



LEVEL



# FASTING HISTORY

THE FASTING BOOST  
Method

# Fasting History



Fasting is practiced in many religions (Islam, Christianity, and Buddhism) as a way to cleanse or purify a human's soul.

The concept of fasting is not new. Humans have fasted under different practices; be it for overnight period, religious reasons, or due to food scarcity.

Fasting is considered as one of the most ancient healing traditions in the world. The Greek scientist, Hippocrates of Cos, prescribed the practice of fasting. Other Greek thinkers such as Plato and Aristotle also staunchly supported fasting.

The ancient Greeks believed that fasting is a universal instinct to several kinds of illnesses. They were also of the view that it increases cognitive abilities.



LEVEL



# FASTING MYTHS

THE FASTING BOOST

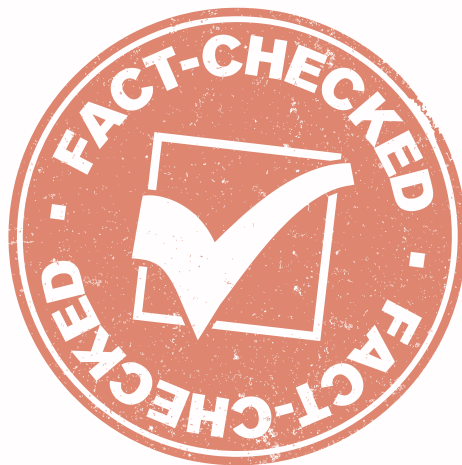
Method



# Fasting Myths

As is the case with diets and nutrition, intermittent fasting too has its share of myths and misconceptions.

Read on and do not fall prey to them.



## Fasting Myths: Breakfast is the most important meal of the day!

When you first wake up in the morning, your insulin level is quite low and most people are just starting to enter the fasted state, 12 hours after eating the last meal of the previous day.

The worst thing you could do is to eat food, spiking insulin and glucose and immediately shutting off fat-burning. A much better choice would be to push the first meal of your day out at least a few hours, during which you can fully enter the fasted state and burn stored body fat.

The VERY WORST would be to eat a high carbohydrate breakfast, spiking insulin and glucose as high as possible; in addition to shutting off fat-burning for likely 12 hours, this will drive as many calories as possible into fat stores as well as providing further reinforcement of the burning of glucose rather than fat.

## "Breakfast is the most important meal of the day"!

Also, high spikes of insulin and glucose always lead to large drops in glucose a few hours later, which triggers HUNGER (if you want to have hypoglycemia or low blood sugar and ravenous hunger, just eat a breakfast of pure carbohydrates and then wait 2-3 hours to see how you feel).

Interestingly, many properly fat-adapted\* people aren't very hungry in the morning and have no problem skipping breakfast.

This is appropriate, as throughout our evolution humans have always been hunter-gatherers and rather than eating a large breakfast first thing in the morning we would hunt and gather throughout the day, having a larger meal later in the day.

\*Fat adaptation is a long-term metabolic adjustment to ketosis, a state in which your body burns fat for fuel instead of carbs.



**"Your metabolism slows down when you are fasting"**



This is completely false.

A number of studies have proven that in fasting up to 72 hours, metabolism does not slow down at all and in fact might speed up slightly thanks to the release of catecholamines (epinephrine or adrenaline, norepinephrine, and dopamine) and activation of the sympathetic nervous system (sympathetic nervous system is often considered the “fight or flight” system, while the opposite is the parasympathetic nervous system or the “rest and digest” system). [25][26]

It makes sense that this fight or flight sympathetic nervous system would be activated during the daytime, when hunter-gatherer humans are most active and in the fasted state (looking for food), followed by parasympathetic “rest and digest” mode in the evening after eating a large meal.

# Intermittent Fasting Will Slow Down Your Metabolism

When you fast, or your body goes without receiving nourishment, your metabolic rate is lowered as a survival technique to prolong survival. It's important to keep in mind that this only happens when you go without food for more than a week.

In fact, one study [21] revealed that in subjects that fasted for three days, there was no slowdown in their metabolism.

Plus, Intermittent fasting does not involve fasting for that long, therefore, thinking that your body and metabolism will grind to a standstill is unfounded. Understandably, this worry is logical because a slower metabolism is every dieter's worst nightmare.

However, as already explained, such worries and fears lack basis, because fasting is not dieting.

## Intermittent fasting is a form of starving

One of the most common contentions against intermittent fasting is that it's a way of killing and depriving your body of food, which shuts down your metabolism and hinders fat-burning.



Although it's true that prolonged weight loss can decrease the number of calories burned, this is common to weight loss regardless of the method you use.

It has not been proven that this is more associated with intermittent fasting than with other weight loss techniques. As a matter of fact, there is substantial evidence that short-term fasting can improve the rate of metabolism due to a dire surge in norepinephrine levels in the blood.

## Intermittent Fasting is a Form of Starving

The bottom line is, fasting, especially for short periods, does not send the body into starvation.



Rather, for fasts lasting up to 48 hours, metabolism is boosted by the fast.

## Women Should Not Undergo Intermittent Fasting

There is no evidence that intermittent fasting is dangerous for women. Additional studies have shown that while individual women display negative reactions to such a fasting state, it works just fine with other women.

# Women Should Not Undergo Intermittent Fasting

It is simply a question of the individual constitution and willpower, and of course, not all nutrition choices, no matter how beneficial, work equally well for everyone.



No matter what your gender, you can, with the right mindset, manufacture an intermittent fasting schedule that works for your body and health needs. Whether you're a woman is not the question at all.



LEVEL



# FASTING TIPS

THE FASTING BOOST  
Method

# How To Curb Your Hunger

Don't worry, soon fasting will recalibrate your hunger meter.



- Remember that hunger comes in waves. It does not keep going up and up if you don't eat.
- Drink plenty of water, the simplest and easiest method to stave off hunger when fasting.
- Green tea can help decrease Ghrelin, the hormone responsible for hunger.
- Take electrolytes to keep your energy levels up.
- Choose a good water.

# Practical Fasting Tips

- Follow your normal daily routine.
- Get busy away from food, don't test your strong will.
- Mindset: Super important while practicing intermittent fasting.
- Try meditation during the fasting period to allow the hunger pang to pass.
- Read some success stories in our community!



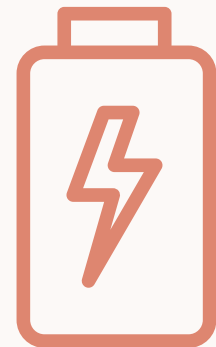
- Distract yourself and keep busy with your activities.

# Tips For Starting & Sticking With It

Be determined, brave and committed during the first few days. If you are serious in your attempts to build self-discipline, you will have to be consistent in your efforts! The more you exercise self-control on a consistent basis, the stronger you will get.

It will take some time for your body to adapt to fasting but once that happens you will feel fantastic and full of energy!

The longer you fast, the more time your body has to put towards healing, cleaning and burning body fat!



Intermittent fasting can quickly become a lifestyle change because it's sustainable.

# Fit Intermittent Fasting into Your Own Life

Arrange your fasting schedule so that it fits in with your lifestyle. If there are occasions such as a celebration or vacation, don't worry too much.

Adjust your fasting schedule accordingly and do not limit yourself socially.

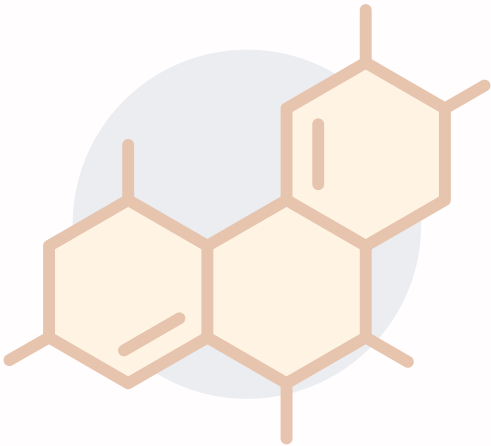


## Green Tea

Green tea is a great weight loss nutritional source.

It is rich in antioxidants and theanine, which speed-up your metabolism and protect your tissues from toxic substances. Additionally, green tea has a moderate amount of caffeine, which acts as a mild stimulant and promotes fat loss.

## Ghrelin –The Hunger Stimulating Hormone



When we say that “hunger comes in waves” what we mean is that Ghrelin (the hunger hormone) generally lasts about 20 minutes. If you can distract yourself it usually goes away.

## A Pinch of Quality Salt



We need to pay attention to electrolyte and mineral intake - and our needs increase even more when we fast.

Replacing lost sodium is essential to feel and perform your best, proper hydration is critical for optimizing mental and physical performance.



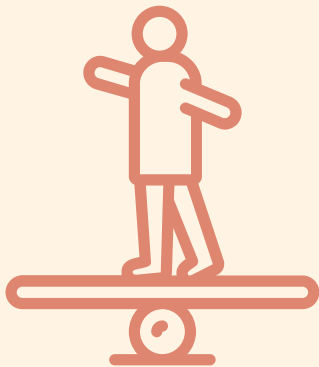
## Make Sure you Stay Busy During your Fast

It often helps to choose a busy day, It'll keep your mind off food. Now is the perfect time to throw yourself into your work or pick up that hobby you have been putting off.

A distraction will keep you from fixating on your hunger and surrendering to hunger pangs during your fasting window. Keep busy during fasting so that you will forget to be hungry.

## Hunger Stabilizes Over Time

Fat-adapting can help too. Training your body to run on fat by fasting curbs appetite by:



- Reducing ghrelin, your hunger hormone
- Improving the function of leptin, your satiety hormone
- Limiting blood sugar fluctuations, which drive cravings.

## Plan your first meal carefully.

If you don't break your fast wisely, your gut won't be happy. This method won't work if you eat lots of processed foods - It's very important to primarily eat healthy foods during your eating window

## Fast With Others

Supportive friends, family members and significant others are critical to your successful fasting journey.



This helps you stay motivated. Plus, it's fun to share metrics like hours fasted.

# Avoiding Hunger With Intermittent Fasting

When we are fasting we avoid meals arbitrarily and modify the intervals at which we consume food, so we can get rid of our habit of consuming many meals a day. This will help us turn away from our conditioned response of hunger every three to five hours.

We will not feel hungry like before. We still get hungry when we are really hungry, experiencing conditioned hunger. We will not consume food based on the clock. We will eat it when our body really needs it.



To avoid hunger conditioning, try to only eat at the table.

Avoid eating food anywhere else at your house, school or work. Avoid eating food in the car as well.

## Fasting Helps Us Avoid Conditioned Hunger

We can make fasting easier by controlling our conditioned reaction to experience hunger because of specific provocation and the cephalic phase response.



We need to avoid artificial sweeteners since they activate the cephalic phase response, prompting hunger and insulin generation.

Stay away from food stimuli during a fast.

## Supplements Can Help

Several safe, clinically approved supplements may help get the most out of intermittent fasting.

Dietary fiber supplements can be valuable additions to your intermittent fasting diet. Fiber reduces the absorption of fat and reduces cholesterol levels.

Supplements that contain Carnitine are also beneficial to amplify the fat-burning process.

## Electrolytes



Fasting increases your \*electrolyte requirements. Take electrolytes to keep your energy levels up. If you don't take electrolytes (especially sodium) during a fast, you won't look, feel, or perform your best.

\*Check Module 2 for more on Electrolytes



## Non-Fasting Hours Reminder

If you practice intermittent fasting followed by periods of overeating, obviously the benefits can easily be lost. You will gain benefits if you consume the same or less calories than the amount of calories you ate before.



You just can't consume more calories and expect to get amazing results.

Don't use intermittent fasting as an excuse to eat tons of junk food when you are eating—continue to eat responsibly, sticking with whole natural foods with high nutrient density and avoiding processed foods!

## First Two Weeks

During the initial two week transition some people have sugar and hunger cravings as well as a little dip in energy levels.

To counteract these feeling you can use MCT, coconut oil or grass-fed butter as a healthy short and medium chain fat to relieve these cravings or lower energy.

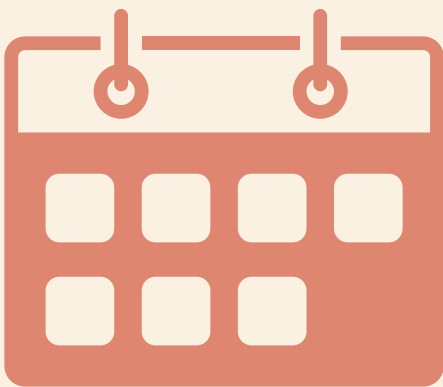


This type of healthy fat can supply your body with some much-needed fuel and provide you with a source of energy until your body can effectively burn your own fat.

# Transition to Intermittent Fasting

As with any new major lifestyle change, you will have to fight through an initial transition period. Going from an eating all the time regimen to intermittent fasting can be a lot because your body is expecting food every 3 hours since that's what you have always done. If you have eaten breakfast every day of your life, your body will be expecting breakfast when you wake up.

However once you get through that initial transition period, your body will actually learn to function better.



It takes your body an average of two weeks to learn how to effectively burn fat as fuel instead of carbohydrate.

## Fasted State



Typically, the fed state starts when you begin eating and for the next three to five hours your body digests and absorbs the food you just ate.

Insulin rises significantly, completely shutting off fat-burning and also triggering excess calories to be stored as fat. After the first few hours mentioned above, your body goes into what is known as the post-absorptive state, during which the components of the last meal are still in the circulation.

The post-absorptive state lasts until 8 to 12 hours after your last meal, which is when you enter the fasted state. It typically takes 12 hours after your last meal to fully enter the fasted state.



LEVEL



# BRAIN FUNCTION

THE FASTING BOOST  
Method

# Blood Sugar Imbalances

When you hear the term blood sugar imbalances, you probably think about diabetes. Blood sugar imbalances, however, not only increase your risk of diabetes but also compromise your brain health.



If your diet is high in processed carbs and refined sugar and low in vegetables, healthy fat, and clean protein, you are setting yourself up for blood sugar imbalances.

Blood sugar imbalances may lead to memory issues, brain fog, irritability, mood fluctuations, lightheadedness, cravings, and fatigue. Eating a high carb quick snack or meal may give you a burst of energy, but it will also lead to a sugar drop soon after characterized by brain fog and tiredness (1, 2).

# Environmental Toxicity

Toxins are unfortunately all around us in our polluted air, municipal tap water, non-organic and processed foods, plastic products, moldy indoor spaces, and conventional beauty, body, and household products. The problem is that all these environmental toxins may have a serious impact on our brain and overall health.



Neurotoxins, such as ethanol (in alcohol), glutamate, mycotoxins, nitric oxide, botulinum toxin (in Botox), tetrodotoxin, and tetanus toxin, are particularly damaging to your neurological functioning.

Environmental toxicity may lead to memory problems, brain fog, dementia, neurodegenerative diseases, mood swings, irritability, fatigue, anxiety, depression, and mental health issues (3, 4).

# Sedentary Lifestyle

You may think that exercise and movement are only important for your physical strength, toned look, or cardiovascular fitness. The truth is that they are critical for your brain health as well.



Regular movement is especially crucial for the areas of your brain that are important for memory formation. Leading a sedentary lifestyle may increase your risk of memory problems, learning troubles, and cognitive decline (5, 6).

# Chronic Stress and Poor Sleep Habits

The amygdala in your brain is responsible for emotional processing.

When you are under stress, your amygdala signals your hypothalamus which is response will increase your heart rate, heightens your senses, leads to heavier breathing and greater oxygen intake, increases cortisol levels and rushes adrenaline across your system. The problem is that if you are experiencing chronic stress, this stress response never ends which leads to cortisol build-up.

Cortisol is not only important for your stress response, but it also helps your hippocampus, the part of your brain where your memories are processed and stored.





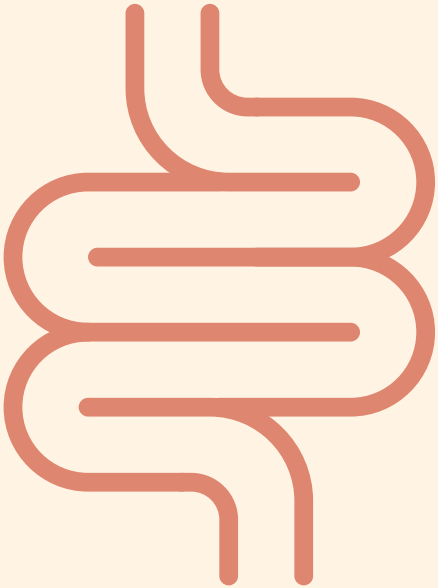
# Chronic Stress and Poor Sleep Habits

When there is too much cortisol in your system due to chronic stress, it can wear your brain down.

It can impair brain and memory function, disrupt synapse regulation, and kill brain cells. Chronic stress has a seriously negative effect on your memory and learning and increases your risk of brain degeneration (7, 8).

If you are experiencing poor sleep on a regular basis, it may have a serious impact on your brain and overall health. Poor sleep may increase the likelihood of chronic stress, high cortisol, fatigue, and chronic inflammation. These factors may contribute to brain fog, memory troubles, learning difficulties, mood swings, and low mood. Sleep deprivation may also increase the risk of dementia, Alzheimer's disease, and other neurodegenerative diseases (9).

# Gut Infections & Dysbiosis



Again, if you think about your gut health, your brain may not be the first thing that comes to mind. However, there is a clear and strong connection between your gut and brain health.

Just think about it. Before a speaking engagement, new date, or any other important event, you may experience gut problems or at least butterflies in your stomach.

This connection between your gut and brain not only happens when short-term exciting or stressful events occur, but the communication between these two organs is on-going, long-term, and intimate. Gut dysbiosis and gut infections lead to an imbalance in your entire body and increase chronic inflammation.

## Gut Infections & Dysbiosis

Gut microbiome imbalance and consequent chronic inflammation may lead to brain degeneration. They may increase your risk and symptoms of brain fog, memory problems, learning difficulties, cognition, mental health issues, mood imbalances, & neurodegenerative diseases (10, 11, 12, 13).

## Brain Autophagy

The word autophagy comes from the Greek word 'auto-phegein' or 'self-eating'. It refers to the process of cellular recycling where the cell itself metabolizes various components in order to reuse them and build new and healthier cell structures.

# Brain Autophagy

Our cells contain a number of important components called organelles. When your cells are exposed to stressors, such as nutrient deprivation, they create a double-membrane structure called phagophore.

The phagophore is very flexible and able to surround cellular components and deliver them to lysosomes. Lysosomes are unique organelles that are able to degrade particular components by releasing degrading enzymes upon them.

The major driver of any autophagy is cellular stress. Your body is seeking balance and homeostasis. When stress, such as nutrient deprivation from fasting or exercise happens, your body needs to prepare for survival. To do this, it breaks down older or damaged cells and cellular organelles to leave room for the creation of new and healthier ones for better energy efficiency.

# Brain Autophagy

The major driver of any autophagy is cellular stress. Your body is seeking balance and homeostasis. When stress, such as nutrient deprivation from fasting or exercise happens, your body needs to prepare for survival. To do this, it breaks down older or damaged cells and cellular organelles to leave room for the creation of new and healthier ones for better energy efficiency.



Brain autophagy refers to the process of autophagy in your brain. It allows the removal of old and damaged brain cells and the creation of new and healthy brain cells. Brain autophagy is essential for memory, cognition, and brain health, and may help to reduce brain degeneration (14,15,16,17)

# Protect & Heal Your Brain

Chances are, you want to say good-bye to brain fog, memory issues, learning troubles, mental fatigue, and low mood. You certainly want to protect your brain from neurodegeneration, dementia, and Alzheimer's disease.

Read on to learn the ways to protect and heal your brain cells naturally. Practicing some form of all of these strategies is important for optimizing your mental health and keeping your brain healthy and strong.

## Cold Showers

Cold showers or alternating shower temperatures between warm and cold has a powerful effect on circulation.





## Cold Showers

When you expose yourself to cold temperatures your body constricts blood supply.

When exposed to heat the vessels dilate and expand. Changing these temperatures and particularly using cold water dramatically improves the tone of the blood vessel walls.

This gives the body a greater adaptability in driving blood into areas that are needed.

Chronic cold exposure induces Autophagy to promote fatty acid oxidation, mitochondrial turnover, and thermogenesis in brown adipose tissue (21)

# Cold Showers

The best strategy for beginning to use cold shower therapy is to begin with a comfortable warm shower and then switch the temperature lower towards the end of the shower.

If you do this consistently, over time your body will adapt and get more tolerant with the temperature change and you will reap the health benefits.

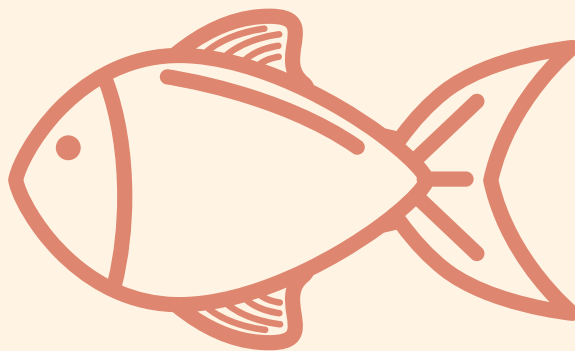


# Anti-Inflammatory Diet

Eating an anti-inflammatory diet rich in nutrient-dense foods is critical for your brain health.

Begin by removing all inflammatory foods, including refined sugar, gluten, refined oils, deep-fried and processed foods, conventional dairy, grain-fed meat and eggs, soda and sugary drinks, and foods that you are sensitive to.

Instead, eat an anti-inflammatory diet with lots of greens, vegetables, low glycemic index fruits, herbs, spices, healthy fats, grass-fed meat, and wild-caught fish.



# Intermittent Fasting

Intermittent fasting helps cellular repair, autophagy, immune regulation, inflammation levels, and insulin sensitivity, and decreases the risk of chronic diseases, including neurodegenerative conditions, such as Alzheimer's (18).

New research has indicated that fasting can significantly reduce the effects of aging on the brain. It has been known that bouts of intermittent fasting have a powerful anti-inflammatory effect on the entire body.

Leading scientists now believe that intermittent fasting is one of the key strategies for maximizing brain function.

Professor Mark Mattson, who is the head of the Institute's laboratory of NeuroSciences, made it clear that these benefits were not just related to calorie restriction but instead to intentional periods of intermittent fasting.

## 2 Major Physiological Phases: Building and Cleansing.

Eating stimulates the body to go into building phase where we are anabolic in nature and store both nutrients and toxins. This phase is essential for building new cells and tissues and store nutrients for times of scarcity.

This building phase of physiology is predominately led by the hormone insulin.

Fasting for more than four hours begins the cleansing phase. The cleansing phase is catabolic in nature. In that it tears down old damaged cells. This process turns on brain autophagy, or “self-eating,” in where the cells recycle waste material, regulate waste products and repair themselves.

These genetic repair mechanisms are turned on through the release of human growth hormone (HGH).

## 2 Major Physiological Phases: Building and Cleansing.

Intermittent fasting is one of the most powerful modalities for reducing inflammation, boosting immunity and enhancing tissue healing. This is one of the reasons why many people feel nauseated when they have infections.

This innate mechanism is the body's way of influencing us to fast so it can produce the right environment to boost natural immunity.





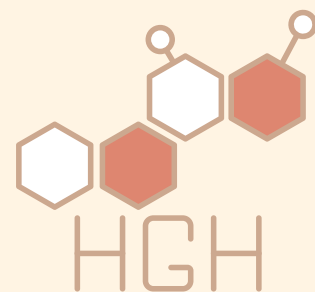
## Fasting Boosts Brain-Derived NeuroTrophic Factor (BDNF)

BDNF levels govern the formation of new neurons and the development of synapses and various lines of communication within the brain.

Higher levels of BDNF lead to healthier neurons and better communication processes between these neurological cells. Low levels of BDNF are linked to dementia, Alzheimer's, memory loss and other brain processing problems.

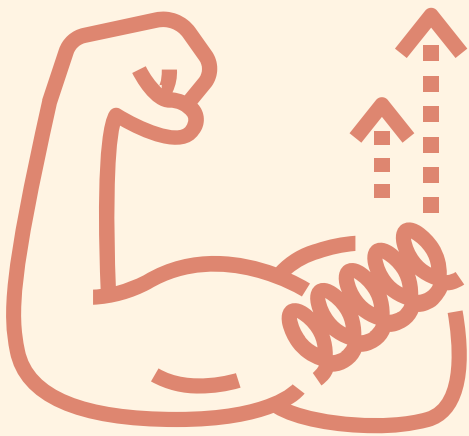
## Fasting Boosts Human Growth Hormone (HGH)

HGH is known to create physiological changes in metabolism to favor fat burning and protein sparing.



# Fasting Boosts Human Growth Hormone (HGH)

The proteins and amino acids are utilized to improve brain and neuron processing. They also repair tissue collagen which improves the functionality and strength of muscles, tendons, ligaments, and bones. HGH also improves skin function, reduces wrinkles and heals cuts and burns faster.



Researchers at the Intermountain Medical Center Heart Institute found that men, who had fasted for 24 hours, had a 2000% increase in circulating HGH.

Women who were tested had a 1300% increase in HGH. The researchers found that the fasting individuals had significantly reduced their triglycerides, boosted their HDL cholesterol and stabilized their blood sugar.

# Anti-Inflammatory Effect

Research has shown that bouts of fasting have a great anti-inflammatory effect on the entire body.

Sufferers from asthma have shown great results as have preliminary reports on individuals with Alzheimer's and Parkinson's. Mattson and colleagues are preparing to study more details about the impact of fasting on the brain using MRI technology and other testing.



# Fasting & Exercise

The cleansing phase also acts like a slinky that is being spring-loaded for when the body moves into the building stage.

It provides a sort of pre-load that allows the body to adapt in an incredible manner when it goes into the building phase. This enhances the neuronal connections and improves brain function.

Experts believe the intermittent fasting puts the brain cells under mild stress that is similar to the effects of exercise on muscle cells. The stress causes them to adapt and get more energy efficient.

The body recovers from intense exercise through both the building and cleansing phases.

LEVEL



# FASTING & EXERCISE

THE FASTING BOOST  
Method

# Fasted Exercise

Can you even exercise while you're fasting?  
The answer is a YES.



So what exactly is fasted cardio, anyway?

Simply put, it's the act of completing a workout without fueling up on food beforehand. Most often, people who prefer to work out on an empty stomach will crush their cardio first thing in the morning, after waking up from a good night's sleep.

For best results and the most benefits of fasted cardio, exercising in the morning is your best bet.

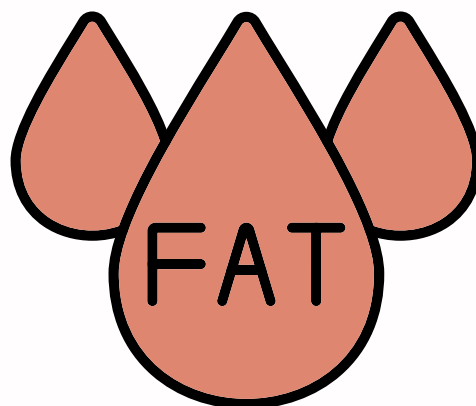
In fact, even two fasted workouts a week can make a drastic difference in the way your body burns fat and can improve your endurance.



# Fasted Exercise

Intermittent fasting is the most powerful way to shift your body into fat burning mode. This is the same concept when you exercise in a fasted state. Exercising after you have been fasting for at least a period of 8-16 hours dramatically increases fat burning.

Without the glucose and glycogen to pull energy from during your workout, your body is forced to adapt and pull its energy from fat. Since your metabolic demand during a workout is way higher than at rest, you will be burning way more fat during your workout. This leads to a much more efficient and effective workout giving you amazing fat burning results!



# Fasted Exercise & Hormone Optimization

This is one of the most controversial topics in the world of health and fitness.

An empty stomach can help because of hormonal changes inside your body that can foster fat burning and muscle building.

In particular, an empty stomach can improve your sensitivity to insulin and increased natural production of growth hormones, which enable you to grow more muscle mass faster.

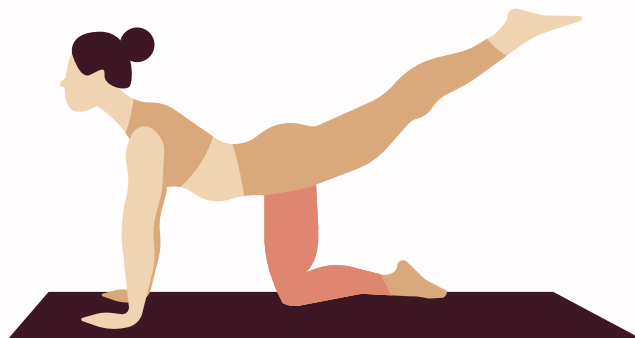
Your body produces insulin via the pancreas when you eat, which helps you utilize your foods' nutrient content. Insulin removes blood sugar from your blood and drives them to your fat cells, muscles, and liver for future use. The problem usually lies when it is too much — and too often — and as a result, your body may become less sensitive to insulin.

# Fasted Exercise & Hormone Optimization

Lower insulin sensitivity brings with it a host of other health issues, including inability to lose (or even gain more) body fat and higher risks for cardiovascular diseases and cancer.

Eating less frequently — as is the case when you fast intermittently — minimizes your body's production of insulin and as such, lowers your risk for becoming less and less sensitive to it over time.

The less insulin your body needs to produce, the more vulnerable it becomes to insulin, which helps you burn body fat and lower your risks for diabetes and cardiovascular diseases.



# Fasted Exercise & Hormone Optimization

Exercising on an empty stomach also helps your body concoct more of the magical elixir of a hormone called growth hormone or GH, which is important for increasing muscle mass, stronger bones, the ability to burn fat, longevity and improved physical functioning.

Studies have shown that a man's GH production skyrockets by a mesmerizing 2,000% and a woman's by 1,300% when they fast for 24 hours.



Could you believe those numbers? All by not eating for 24 hours! And dig this, those studies also showed that as soon as the fast is ended, GH production plummets back down to normal.

It is another reason to fast regularly and intermittently — optimal GH production levels.

## Fasted Exercise

Aerobic exercise performed in the fasted state induces higher fat oxidation than exercise performed in the fed state, which actually benefits your muscle.

Working out on an empty stomach is ideal for people with particular lifestyles and remember, fasted cardio isn't for everyone.

## Compound Exercise

This will definitely help boost your fasting protocol because the more muscle you have on your body the more anabolic your body becomes.

It will send the signals to protect your muscles and to take more of your calories from your body fat and to make sure to reallocate the calories that come into your body into your muscle.

# Compound Exercise

One of the greatest compound exercise is the deadlift, and the one that tackles nearly every muscle group in your body, such as your arms, triceps, biceps, forearms, legs, calves, lower back and your core.

This is one of those workouts that you want in your tool belt. If you work on the muscle every day, even if you're not building it simply working on it will send the correct signals to your body to add more calories to your muscles as we mentioned, which means it will starve your fat even more.

Also, because you're doing it in a fasted state (yes! you want to do this in a fasted state) you're also burning more body fat at the same exact time and this is a great bonus thing to have that will move you in the right direction.



## Fasted Exercise: Do's



- Listen to your body
- Do what feels best for you.
- Follow a balanced diet to maximize your output during the session.
- Consider consuming a black coffee one hour before training in a fasted state to enhance your athletic performance.
- Do it right before you start your eating window for the day.
- Start small with the amount of fasted workouts you complete.

## Fasted Exercise: DON'Ts



- Don't try this if you are lactating or pregnant.
- Don't forget to stay properly hydrated.
- Fasted workouts are not suitable for those with medical conditions.
- If you're still unsure, consult a physician or dietician for medical advice.

Many studies show that following intermittent fasting can in fact enhance the long-term health benefits of your exercise program, and turn back the biological clock in your muscle and brain.

Also, improve insulin sensitivity, boost testosterone, prevent depression and increase your blood flow.

## Less Muscle Loss

One of the worst side effects of traditional dieting is that your body tends to burn lean healthy muscle in the process instead of the fat that most people are seeking to lose.

Intermittent fasting causes much less muscle loss than standard methods of weight loss, giving intermittent fasting superior benefits in preserving lean body mass.

On average, around 90% of the weight loss with Intermittent Fasting is in the form of fat, compared to 75% on the standard diet of continuous calorie restriction.

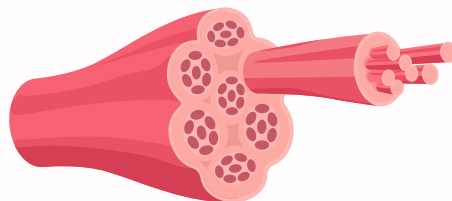
Meaning that 25% muscle loss happens on the standard calorie restriction compared to only 10% muscle loss in the intermittent fasting based regimens.

# Fasting & Muscle Mass

Luckily, not only does reducing your caloric intake not cause your metabolism to slow down, it also does not result in a loss of your hard-earned muscle.

There is one imperative rule that goes along with this statement: You have to be involved in some sort of resistance exercise, such as lifting weights.

Now, to be clear, you do not have to weight training at the exact same time you are fasting, but both resistance training must be occurring at some point for your muscle mass to be preserved in the face of a caloric deficit.



# Fasting & Muscle Mass

Research found that when men and women followed a 12 week diet consisting of only 800 calories and around 80 grams of protein per day, they were able to maintain their muscle mass as long as they were exercising with weights three times per week. (22)

In yet another study, 38 obese women undertaking a reduced-calorie diet for 16 weeks were also able to maintain their muscle mass by training with weights three times per week. (23)

As long as you are using your muscles, they will not waste away during short periods of dieting.



# Fasting & Muscle Mass

Even more good news comes from the fact that your weight workouts don't have to be painfully long to be effective.

When forty-four overweight women performed a 30- minute weight training workout three days per week for twenty weeks while following a low-calorie diet, they were able to lose almost 5% body fat while maintaining all of their lean body mass. (24)

Finally, research has clearly shown that fasting for as long as 72 hours (regardless of whether or not you are exercising) does not cause an increased breakdown in your muscle, nor does it slow down muscle protein synthesis. (25)

Fasting and low calorie diets DO NOT cause you to lose muscle mass if you are resistance training.



LEVEL



# RE-FEEDING SYNDROME

THE FASTING BOOST  
Method

# Re-feeding Syndrome

## THE FASTING BOOST

People at high risk of refeeding syndrome:

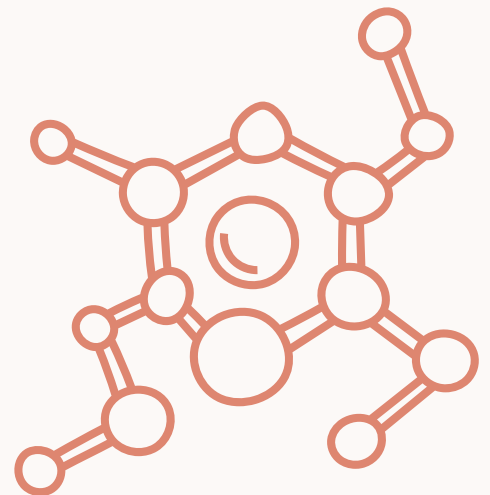
- Anorexia nervosa
- Chronic alcoholism
- Oncology patients
- Postoperative patients
- Elderly patients (comorbidities, decreased physiological reserve)
- People with uncontrolled diabetes mellitus (electrolyte depletion, diuresis)
- People with chronic malnutrition:
  - Marasmus
  - Prolonged fasting or low energy diet
  - Morbid obesity with profound weight loss
  - High stress patient unfed for >7 Days
  - Mal-absorptive syndrome (such as inflammatory bowel disease, chronic pancreatitis, cystic fibrosis, short bowel syndrome)
    - Long term users of antacids
    - Long term users of diuretics (loss of electrolytes)

# Re-feeding Syndrome

Complications with re-feeding were first described in severely malnourished Americans in Japanese prisoners of war camps in World War 2. It has also been described upon treatment of long standing anorexia nervosa, and alcoholic patients. It is important to have an understanding of these syndromes if you are attempting an extended fast - usually greater than 5-10 days at a time.

Re-feeding refers to the period of time immediately after an extended fast when you are just starting to eat again.

Re-feeding syndrome has been defined as the “potentially fatal shifts in fluids and electrolytes that may occur in malnourished patients”.



The key clinical marker of this is hypophosphatemia - very low phosphorus levels in the blood.

# Re-feeding Syndrome

However, lowered potassium, calcium, and magnesium in the blood may also play a role. Calcium, phosphorus and magnesium are all primarily intra-cellular ions – that is, they are kept inside the cells and blood levels (which are outside of cells) tend to be quite low compared with concentrations inside cells.

Adults store 500-800 grams of phosphorus in the body.



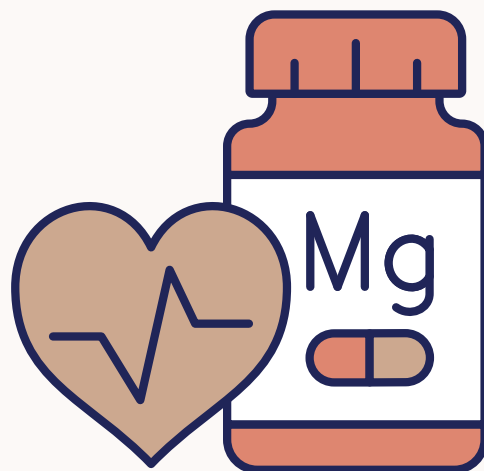
Approximately 80% of the phosphorus in our bodies is held within the skeleton and the rest in soft tissues. Almost all of the phosphorus is inside the cell, rather than outside, in the blood.

The blood level of phosphorus is very tightly controlled and if it goes too high or low, can cause real problems.

# Re-feeding Syndrome

Average daily intake of phosphorus is 1g/day, meaning that it often requires many months of undernutrition to produce these syndromes. Protein rich foods, as well as grains and nuts are good sources of phosphorus. 60-70% of the phosphorus is absorbed, mostly in the small intestine.

Much of the calcium, phosphorus and magnesium in our bodies is stored in the bones. If the body needs more of these intracellular ions, it will take it from the bone 'stores'. If there is too much, these get deposited into the bone.





# Re-feeding Syndrome

During prolonged malnutrition, blood levels of phosphorus remain normal and the deficit is taken from the bones. This can last for a very long time, as was proven with severe malnutrition imposed on the Japanese prisoners of war during World War 2.

But there are some problems that can happen once food is given, particularly carbohydrate containing foods. During the refeeding period, insulin and other hormones are activated. This causes the movement of the major intracellular ions (phosphorus, potassium, calcium and magnesium) into the cells.

However, due to overall depletion of body stores, this becomes excessive and too little of these ions are left in the blood. This is what causes the major symptoms of the re-feeding syndrome, some of which are rarely fatal.

# Re-feeding Syndrome

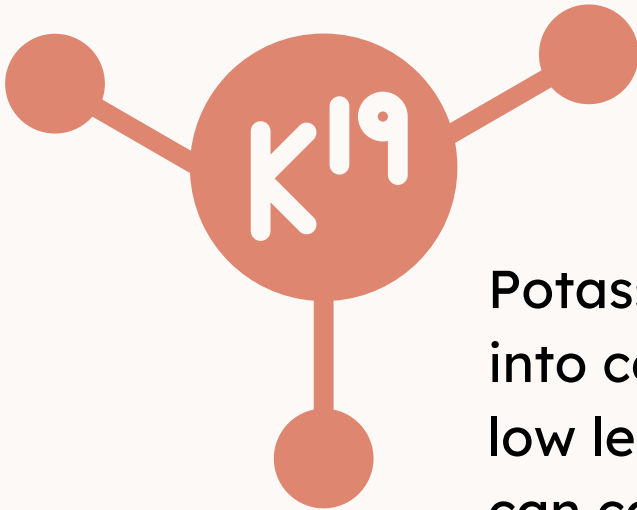
Phosphorus is used in all cells for energy. The basic unit of energy (ATP) contains 3 phosphorus molecules so severe depletion of phosphorus may cause your entire body to ‘power down’.

This typically happens when the serum phosphorus level drops below 0.30 mmol/L. The symptoms include muscle weakness as well as breathing difficulty as the diaphragm (the large muscle powering the lungs) weakens. Outright muscle breakdown (rhabdomyolysis) has been described, as well as heart dysfunction (cardiomyopathy).

Magnesium is a co-factor in most enzyme systems in the body and severe depletion can result in cramps, confusion, tremor, tetany and occasionally, seizures. Cardiac rhythm abnormalities are also described – classically the pattern known as Torsades de Point. Most magnesium (about 70%) taken orally is not absorbed but excreted unchanged in the feces.



# Re-feeding Syndrome



Potassium may also be shifted into cells, leaving dangerously low levels in the blood. This, too can cause heart rhythm disturbances or even outright cardiac arrest.

Insulin stimulates glycogen, fat and protein synthesis which requires many ions like phosphorus, magnesium, and cofactors like thiamine.

The insulin surge puts an enormous demand on phosphorus stores which have been depleted. In essence, the stores of all these intracellular ions has been severely depleted and once the signal is given to replenish, too much phosphorus is taken out of the blood leading to excessively low levels.

# Re-feeding Syndrome

So you can see that one of the key prerequisites for re-feeding syndrome is severe, prolonged malnutrition.

How common is it? A study of over 10,000 hospitalized patients (19) only found an incidence of 0.43%. These are the sickest of sick people, but still was found rarely.

This is actually an overestimate since it also included diabetic ketoacidosis, which is a different mechanism entirely. The main groups that had this disease? Severe malnourishment and alcoholics.

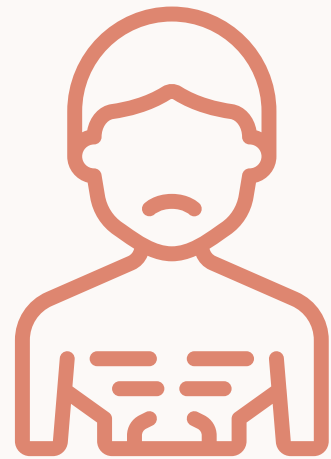
Refeeding syndrome is most often described in the situation of parenteral (intravenous) refeeding in the intensive care unit.

These patients are often intubated and cannot eat for weeks. In the setting of relative malnourishment, extremely calorically dense and nutrient rich fluids are introduced directly into the vein. A setup for re-feeding syndrome.

# Re-feeding Syndrome

The main risk factor for re-feeding syndrome is prolonged malnutrition. When we use fasting as a therapeutic tool, most people have never missed a single meal in over 25 years!

This is hardly the situation that we deal with currently. However, it is important to understand that patients that are severely underweight or malnourished should not fast..



This is important because re-feeding syndrome is mostly found in the condition of starvation (uncontrolled, involuntary restriction of food) or wasting (starvation to the point of severe malnutrition) rather than fasting (controlled, voluntary restriction of food).

# Re-feeding Syndrome



Vitamin deficiencies have also been described, again mostly with prolonged malnutrition.

The most important is thiamine, which is an essential coenzyme in carbohydrate metabolism.

LEVEL



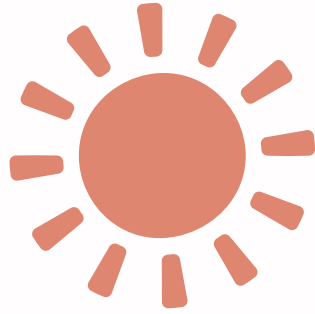
# OPTIMIZED FASTING SCHEDULE

THE FASTING BOOST  
Method



# Optimize Your Fasting Schedule

## Morning



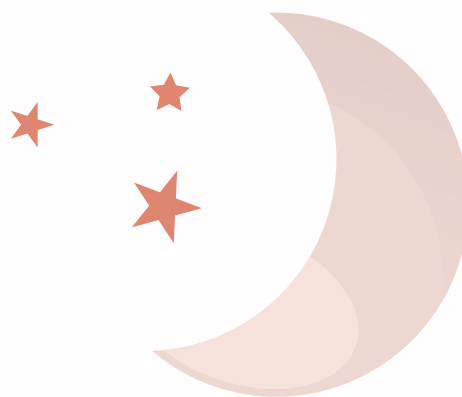
- Wake up at the same time every day, record wake time.
- Walk outside for 10-60 minutes (leads to focused alertness)
- Drink 32 oz water with 0.5 tsp salt
- Delay coffee until 90-120 minutes after waking
- Delay food until ~12pm
- 1 hr workout (cycles of 3 days of lifting, 2 days of cardio)
- Then 3 days of cardio, 2 days of lifting)

# Optimize Your Fasting Schedule

## Afternoon

- Lower-carb lunch (mostly meat and vegetables, add carbs if you exercised).
- Try to not eat much past 80% full.
- Get omega 3s.
- Walk 5-30 minutes after lunch.
- Some form of relaxation practice.

## Evening



- Eat dinner with some protein to improve sleep.
- Take a hot shower/20 minute sauna before sleep.
- Go to sleep at the same time every day in a dark, cool room.



# REFERENCES:

1. How diabetes affects your brain. Web MD.  
<https://www.webmd.com/diabetes/diabetes-basics#1>
2. Blood sugar on the brain. Harvard Health Publishing.  
<https://www.health.harvard.edu/diseases-and-conditions/blood-sugar-on-the-brain>
3. Yegambaram M, Manivannan B, Beach TG, Halden RU. Role of environmental contaminants in the etiology of Alzheimer's disease: a review. *Curr Alzheimer Res.* 2015;12(2):116-46. doi: 10.2174/1567205012666150204121719. PMID: 25654508
4. Liu J, Lewis G. Environmental toxicity and poor cognitive outcomes in children and adults. *J Environ Health.* 2014 Jan-Feb;76(6):130-8. PMID: 24645424
5. Wheeler MJ, Dempsey PC, Grace MS, Ellis KA, Gardiner PA, Green DJ, Dunstan DW. Sedentary behavior as a risk factor for cognitive decline? A focus on the influence of glycemic control in brain health. *Alzheimers Dement (N Y).* 2017 May 2;3(3):291-300. doi: 10.1016/j.trci.2017.04.001. PMID: 29067335
6. Sitting is bad for your brain — not just your metabolism or heart: Thinning in brain regions important for memory linked to sedentary habits. University of California, Los Angeles. ScienceDaily
7. Van der Kooij MA, Fantin M, Rejmak E, Grosse J, Zanoletti O, Fournier C, Ganguly K, Kalita K, Kaczmarek L, Sandi C. Role for MMP-9 in stress-induced downregulation of nectin-3 in hippocampal CA1 and associated behavioural alterations. *Nature Communications*, 2014; 5: 4995.
8. How stress and depression can shrink the brain. Yale University. ScienceDaily. ScienceDaily, 12 August 2012.  
<https://www.sciencedaily.com/releases/2012/08/120812151659.htm>
9. Holth JK, Fritschi SK, Wang C, Pedersen NP, Cirrito JR, Mahan TE, Finn MB, Manis M, Geerling JC, Fuller PM, Lucey BP, Holtzman DM. The sleep-wake cycle regulates brain interstitial fluid tau in mice and CSF tau in humans. *Science*, 2019.
10. Lucas G. Gut thinking: the gut microbiome and mental health beyond the head. *Microb Ecol Health Dis.* 2018 Nov 30;29(2):1548250. doi: 10.1080/16512235.2018.1548250. PMID: 30532687
11. Appleton J. The Gut-Brain Axis: Influence of Microbiota on Mood and Mental Health. *Integr Med (Encinitas).* 2018 Aug;17(4):28-32. PMID: 31043907

# REFERENCES:

12. Rogers GB, Keating DJ, Young RL, Wong ML, Licinio J, Wesselingh S. From gut dysbiosis to altered brain function and mental illness: mechanisms and pathways. *Mol Psychiatry*. 2016 Jun;21(6):738-48. doi: 10.1038/mp.2016.50. Epub 2016 Apr 19. PMID: 27090305
13. Clapp M, Aurora N, Herrera L, Bhatia M, Wilen E, Wakefield S. Gut microbiota's effect on mental health: The gut-brain axis. *Clin Pract*. 2017 Sep 15;7(4):987. doi: 10.4081/cp.2017.987. PMID: 29071061
14. Liaw K, Zhang Z, Kannan S, Neuronanotechnology for brain regeneration, *Advanced Drug Delivery Reviews*, Volume 148, 2019, Pages 3-18. [Link Here](#)
15. Glick D, Barth S, Macleod KF. Autophagy: cellular and molecular mechanisms. *J Pathol*. 2010; 221(1):3-12. PMCID: 2990190
16. Russell RC, Yuan HX, Guan KL. Autophagy regulation by nutrient signaling. *Cell Res*. 2013; 24(1):42-57. PCID: 3879708
17. Wang M. The relationship between autophagy and brain plasticity in neurological diseases. *Front. Cell. Neurosci.*, 24 May 2019
18. Faris MA, Kacimi S, Al-Kurd RA, Fararjeh MA, Bustanji YK, Mohammad MK, Sale ML. Intermittent fasting during Ramadan attenuates proinflammatory cytokines and immune cells in healthy subjects. *Nutr Res*. 2012 Dec;32(12):947-55. PMID: 23244540
19. Camp MA, Allon M. Severe hypophosphatemia in hospitalized patients. *Miner Electrolyte Metab*. 1990;16(6):365-8. PMID: 2089250. <https://pubmed.ncbi.nlm.nih.gov/2089250/>
20. Schabelman E, Kuo D. Glucose before thiamine for Wernicke encephalopathy: a literature review. *J Emerg Med*. 2012 Apr;42(4):488-94. doi: 10.1016/j.jemermed.2011.05.076. Epub 2011 Nov 21. PMID: 22104258.
21. Chronic cold exposure induces autophagy to promote fatty acid oxidation, mitochondrial turnover, and thermogenesis in brown adipose tissue Winifred W. Yau,<sup>1</sup> Kiraely Adam Wong,<sup>1</sup> Jin Zhou,<sup>1</sup> Nivetha Kanakaram Thimmukonda,<sup>1</sup> Yajun Wu,<sup>2</sup> Boon-Huat Bay,<sup>2</sup> Brijesh Kumar Singh,<sup>1</sup> and Paul Michael Yen

# REFERENCES:

22. Bryner RW. Effects of resistance training vs. Aerobic training combined with an 800 calorie liquid diet on lean body mass and resting metabolic rate. *Journal of the American College of Nutrition* 1999; 18(1): 115- 121

23. Janssen I, et al. Effects of an energy-restrictive diet with or without exercise on abdominal fat, intermuscular fat, and metabolic risk factors in obese women. *Diabetes Care* 2002; 25:431-438

24. Marks BL, Ward A, Morris DH, Castellani J, and Rippe RM. Fat-free mass is maintained in women following a moderate diet and exercise program. *Medicine and Science in Sports and Exercise*. 1995; 27(9): 1243-51

25. Gjedsted J, Gormsen L, Buhl M, Norrelund H, Schmitz, Keiding S, Tonnesen E, Moller N. Forearm and leg amino acids metabolism in the basal state and during combined insulin and amino acid stimulation after a 3- day fast. *Acta Physiologica*. 2009; (6): 1-9.

26. INTERMITTENT FASTING WITH 72 HOURS FASTING AND 96 HOURS REFEEDING PROMOTES FAT OXIDATION AND WEIGHT SUPPRESSION  
Endo, S.; Miyashita, K.; Uto, A.; Ryuzaki, M.; Inoue, H.; Fujii, K.; Hiroshi, I.

# END OF LEVEL

