

COMPILED BY ABDEL ILLAH BABA

ALL IT TAKES TO BE Healthy

The Simple Science of Maintaining,
Improving, and Elevating Health and
Fitness That **Everyone Should Know**



Abby Black, RDN, Dr. Bahareh Moshtagh, ND,
Dr. Assia Megnounif, MD

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Thrive2survive.com

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Dr. Assia Megnounif	Chapter 06



*Dedicated to the soul of my aunt, **Maria**, whose courageous experience with cancer delivers one of the best lessons in faith, patience, persistence, and solidarity for all the world to learn from.*



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- * **Dr. Bahareh Moshtagh, ND**, (*Reviewer and co-author of Chapter 05*), and
- * **Dr. Assia Megnounif, MD**, (*Reviewer of Chapter 06*).

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Dr. Bahareh Moshtagh believes that health is a continuum, not a destination, and aims to educate and empower her patients to create meaningful, long-lasting changes. She makes it a priority to instill lifestyle changes in the lives of her patients rather than suppress the symptoms or opt into any unnecessary therapies. Educating her patients on what is fad, fact or fiction is central to all her appointments.

She assesses the mental-emotional preparedness of her patients and addresses deep-rooted issues while treating common and rare conditions. Dr. Moshtagh's philosophy on health and wellness lies in the belief that we are part of nature and often have to remind ourselves to go back to the basics and foundations of health: sunlight, fresh air, clean water, mental-emotional wellbeing, and food as medicine.

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(Chapter 06)

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Dr. Assia Megnounif uses her maiden and husband's family names interchangeably on social media, where she can also be found as Dr. Assia Baba, too.

*A healthy society requires no more doctors in service but more people with a firm **education** in the field to keep their own **health** in check and that of their families.*

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PREFACE

If you have ever followed a health-promoting guideline, weight loss plan, or weight maintenance strategy and it did not work, let me draw your attention to this small fact: Almost no one can SOLELY set the boundaries of YOUR healthy lifestyle unless with a detailed diagnosis of your OVERALL health status.

The problem with these public guidelines is not necessarily with the reliability or effectiveness of their common recommendations. Instead, these guidelines tend to be generalized, a sort of one-size-fits-all approach. While it is a well-known fact that in order to outline regulations and health standards that fit a whole public category or a particular demographic group, authenticity must be—at least partially—sacrificed to make space for that generalization, leaving some huge yet unobserved gaps that you will only discover at the disastrous outcome.

Running, by way of instance, is a basic cardiovascular exercise that helps build strong bones and strengthen muscles. It is widely acknowledged as an essential part of a healthy lifestyle, and many people who want to make life changes learn to begin by setting forth running first. However, suppose your BMI is 30.0 or higher. In that case, the exercise that works best for most

people will cause a serious threat to your health, for running with an overload of mass will increase compressive stress on your supporting joints and bones in the lower part of the body.

In other situations, the risks of following an unsuitable health-promoting program can be even more serious. Indeed, while no one is immune to such risk in the attempt to embark on a new lifestyle with no health coach supervision (which is neither accessible nor affordable for the majority), there seems to be no substitute for self-education to cover for that vulnerability.

Now, I do not want to shed light on all the reasons behind the popularity of such ready-to-follow programs and guidelines as I am trying to lay this Preface in the minimum of lines. Still, I have to point out that *the public's tendency to go for instant stuff instead of building a science-based foundation of health education* must have had a big contribution. However, if you truly value your own health and that of your family, there are some must-have pieces of education to grasp from all major nutrition and health areas and their relevant aspects. That would cover:

1) **The fundamental aspects of nutrition**—that is, *how the body uses food nutrients and how "what," "when," "how much," and even "where" to eat may affect your health.*

2) **The functions of the major body systems** and how you can naturally **Maintain**, **Promote**, or even **Regain** the normal (healthy) functioning of a particular system in the wake of a functional failure.

3) The medical dimensions of a few exceptional **Health-threatening body failures** to learn about and prevent by following the suggested preventive actions, all of which are profoundly covered between two ends to help you readily and safely set the boundaries of your target healthy lifestyle yourself on a factual basis.

Ultimately, and not further from the topic of health, the book touches upon some psychological facts and basics of cognitive psychology to conclude with the only systematic way that would help you smoothly and naturally embrace any lifestyle change—*be it breaking a bad habit or cultivating a new healthy one*—for a lifetime.

In closing, I can't claim that all those aforementioned aspects of health education are exclusive to this work (though some parts actually are). It still repeats some ideas that other publications before this one have already expressed; our aim is not originality but inclusiveness after all. And for that sake, we have left no stone unturned to give you, within about two hundred pages, this unique opportunity to master The Simple Science of Health and Fitness that YOU and Everyone Should Know.

All It Takes To Be Healthy,
Abdel illah BABA

PART I THE SIMPLE SCIENCE OF MANAGING YOUR HEALTHY FOOD CHOICES

Human health and food meet in a very complex relationship. All foods provide the body with new supplies of energy and deliver some nutrients. But while one dietary pattern promotes health and prevents illnesses, other eating practices are associated with life-threatening health CONDITIONS such as obesity and other diet-related diseases in the long term.

Within its four chapters, Part I helps you gain insight into the main aspects that make up the elements of your healthy diet in order to achieve the ideal impact of food on your health with the maximum benefits and the minimum harm in general, or even to reach a particular health-related goal according to your specific needs.

PREREQUISITE #1

HOW DOES THE BODY USE ENERGY ABSORBED FROM FOOD

(Through “metabolism”)

“Metabolism” is the set of the biochemical processes needed to maintain life within an organism, such as breathing, enzyme actions, and fat storage. In nutrition science, the term mainly refers to this process, which involves breaking down complex food molecules into smaller ones to build new substances and tissues in the body or to generate energy.

Accordingly, the term “metabolic rate” is defined as the rate at which metabolism occurs in a living organism or the total energy expenditure.

Basal Metabolic Rate (BMR) is the largest amount of energy expended daily. It represents the number of calories burnt at rest, counting only the internal energy expenditure, without considering the energy used during any physical activity. At the same time, 30–45 minutes of moderate-intensity physical activity costs the body 20% of daily energy use.

Slow metabolism means more energy is likely to be stored in the body as added fats rather than to be used, while in the case of a fast metabolism, more energy is burnt. Thus, it will be stored in a very lesser amount.

PREREQUISITE #2

HOW IS THIS ENERGY MEASURED (By “calories”)

A calorie is a unit of measurement used to measure energy. Generally, in science, the one calorie (1 kcal) refers to the amount of energy needed to raise the temperature of one kilogram (1 kg) of water by one degree Celsius (1° C).

In nutrition, the amount of energy that a particular product provides is measured by ‘calories’ (c). When you read on the label of a can of soda: ‘Calories: 140 / serving’ and the ‘Serving Size: 1 Can’, it means that the body will get a new supply of energy equal to 140 calories by drinking the whole can.

By consensus, the estimated energy the human body requires for proper functioning ranges from 1,200 to 2,400 calories per day for adult women and 1,800 to 3,000 calories per day for adult men on average, determined under a number of factors, including the person’s age, sex, height, weight, and level of physical activity.

The term “empty calories” refers to the calories taken from products that provide very few of the necessary nutrients. While highly healthy eaters always opt for low-calorie and highly-nutritious food products as a part of a wise calorie investment.

CHAPTER

1

How to Create an Ideally Balanced Diet From the 6 Groups of Nutrients

All food provides you with the energy you need for your own survival. Still, no one food can deliver all the necessary nutrients needed for every part of the body to function effectively and efficiently on a regular basis.

Calcium and iron, for example, are very important components of a healthy diet. The body needs calcium to maintain strong bones and healthy teeth, while lack of iron may give rise to anemia, for iron is important in making red blood cells to carry oxygen around the body. However, most good sources of calcium, like milk, are poor sources of iron. Likewise, most good sources of iron are poor sources of calcium. Therefore, in order to cover your body's needs for both calcium and iron, an ideal balance between particular food choices is imperative.¹²

Calcium and iron belong to the group of minerals. **Minerals**, along with **vitamins** and **water**, are commonly called

“micronutrients” as they are needed in less minimal amounts in the body compared to its needs for the three “macronutrients”: **carbohydrates, fats, and proteins**, which make up the bulk of the human diet.

Ultimately, achieving an ideally balanced diet, in its simplest description, is a matter of balancing the quality and quantity of each of those **six** food categories under the forthcoming clarifications.

Macronutrient #1: Carbohydrates

Carbohydrates are a broad group of food substances that produce energy in the body when they get converted into glucose during digestion.

In the simplest structure, carbohydrates contain carbon, hydrogen, and oxygen atoms. Items in the carbohydrates group contain **sugar**, **starch**, and **fiber**. Depending on the food, carbohydrates may or may not contain different ratios of all of these components. For example, hard candy would only contain sugar but no fiber or starch. An apple would contain naturally occurring sugar and fiber, while an example of food mainly composed of starch without sugar or fiber would be white rice.

On the whole, there are two kinds of carbohydrates in terms of their structure: simple vs. complex.

Simple carbohydrates are saccharide molecules: “glucose,” “fructose,” “galactose,” “maltose,” “lactose,” or “sucrose.” These are types of sugars found in foods such as *fruits, dairy products, honey, and table sugar*.

Complex carbohydrates are polysaccharides that have long chains of glucose molecules bonded together. They are more likely to be found in *bread, legumes, rice, pasta, and starchy vegetables*.

Carbohydrates and Weight-Loss Diets

The increasing popularity of low-carb diets such as Atkins and South Beach, The Zone, and the reformulated Atkin's into the "Keto diet"—*which have proven effective for losing weight in the short term*—has shaken carbohydrates' reputation among the public over the years: If reducing carbohydrates is a part of a successful weight-loss approach, then the nutrient consumption should be associated with weight gain, on the other hand, one might rationally think.

Well, controlling blood glucose is an essential key for weight management. Naturally, carbohydrates raise the levels of blood sugar when they get broken down into glucose. That could be bad news for someone trying to lose weight, but when we intend to evaluate the healthfulness or quality of a particular nutrient, we see it in light of its impact upon the overall health with equal consideration to the potential health-threatening consequences of its deficiency as well.

First, glucose is the primary source of fuel for the human body. It is even more essential for the brain, which cannot easily use other fuel sources (such as fat or protein) to produce energy. That is why one who does not consume adequate amounts of dietary carbohydrates is likely to feel more mentally and physically tired.

Other than that, depriving the body of the necessary carbohydrates may give rise to other short and long-term complications, including *ave "brain fog," muscle cramps, constipation or diarrhea, osteoporosis and bone loss, heart arrhythmias, cardiac contractile, kidney damage, and other gastrointestinal disturbances, as it may increase risks of various chronic diseases.*^{3,4}

Concerning weight management, finding a balance between calories in and calories out is better achieved through regular activity than by depriving the body of its main source of energy on that account (to be detailed in Chapter 05).

Who Said All Carbohydrates Are Created Equal?

The Dietary Guidelines for Americans recommend that carbohydrates should make up 45 to 65 percent of your total daily calories.⁵ That was important. But what food sources they should come from is of equal or even greater importance.

Food manufacturing companies use simple carbohydrates to improve food taste. Processed or simple sugars contribute varying properties to foods such as crystallization, providing a medium for the growth of yeast in baked goods, preventing spoilage, and enhancing flavor.⁶ Still, while plant-based carbohydrate-containing foods like *fruits, whole grains, and vegetables* reduce the risk of diabetes, heart disease, as well as some cancers, processed sugars *such as HFCS (high fructose corn syrup), sucrose, or table sugar* increase the risk of tooth decay, heart disease, and obesity.

For the most part, not all sources of carbohydrates affect your health in the same way. Carbohydrate-containing foods vary in terms of their impact on health, and their quality is evaluated based on two factors:

1/ Fiber Content

Fiber is just another component of carbohydrates alongside sugar and starch, as aforementioned. Yet, its unbreakable nature,

which allows it to pass through the intestinal canal relatively intact, has granted the nutrient some unique properties.

Fiber improves blood glucose control and helps lower cholesterol by sequestering bile salts stored in the gallbladder. It cleans the colon and aids in early satiety, weight loss, and most importantly, aids in the regularity of bowel movements.

Within the fiber category, there are soluble types of fiber that dissolve in water to form a gel and insoluble ones that are water-soluble. Soluble fiber represents the main type of fiber that lowers cholesterol and can better control blood glucose levels.^{7 8} Some common sources, to name but a few, include *oatmeal, apples, dry beans, and lentils*.

Insoluble fiber is the type of fiber that keeps bowel movements regular but still needs ample consumption of water. Examples of common sources of insoluble fiber include *the peels of fruits and vegetables, whole wheat flour, and nuts*.⁹

On a certain level, fiber has shown some preventive effects against various diseases and ailments. Therefore, fiber deficiency or a low-fiber diet may be associated with an increased risk of a wide array of conditions, including *cardiovascular diseases, type 2 diabetes, obesity, diverticular disease, Inflammatory bowel diseases, and colon cancer* to a lesser extent.^{10 11 12 13 14 15 16 17 18 19 20}

2/ Whole vs. Refined Carbohydrates

Whole vs. refined classification is another reliable basis for judging the quality of your source of carbohydrates. Whole and refined carbohydrates get converted into glucose during digestion and raise blood sugar. Still, they were not found to cause the same spikes and dips in blood sugar levels, which has a lot to convey in terms of quality and healthfulness.

Whole carbohydrates in foods like *broccoli, beans, unpeeled apples, quinoa, barley, legumes, and whole grains* contain naturally occurring fiber that is converted within a long and slow digestion process, where glucose is released into the bloodstream at a moderate rate, keeping everything in balance. However, **refined carbohydrates** such as *pastries, white rice, white bread, white pasta, and sugar-sweetened beverages* are either fiber-free or have their natural fiber removed or modified during food processing. In all cases, refined carbohydrates are quickly digested, and their released glucose gets into the bloodstream faster to cause a sudden change in glucose levels in the blood, mainly raising the risk of obesity and type 2 diabetes besides a number of other chronic diseases.^{21 22 23 24 25 26 27} At the same time, our pancreas works to produce insulin to help counteract the rise in blood glucose. Therefore, as long as our pancreas is working well and our liver is not pushing out too much glucose, we do not see anything abnormal in our lab work when focusing on glucose levels.

► **Fakeaway #01**

Carbohydrates occupy a very important place in the human diet. Maintaining the healthy fine line of balance between carbohydrates deficiency and carbohydrate-related diseases is as simple as opting for fiber-rich carbohydrates from whole plant-based food sources.

In doing so, the consumer health education division of Harvard Medical School, Harvard Health Publishing (HHP), advises to: «

- ✓ *Skip the fruit juice and go straight to the fruit. Eat a variety of fruits and vegetables daily.*
- ✓ *Limit the amount of refined sugar, such as high-fructose corn syrup, corn syrup, agave, honey, white and brown sugar, for they lack nutrients and are high in calories. These are often found in cakes, cookies, and donuts.*
- ✓ *Use barley (bulled) in soup instead of rice or pasta.*
- ✓ *Use brown rice in place of white rice in recipes.*
- ✓ *Mix quinoa or wheat berries with vegetables to make a salad.*
- ✓ *Finally, always choose whole grains, such as brown rice, oats, whole-wheat pasta, and whole-wheat bread. To ensure that you are buying a whole-grain product, check the ingredient list. (to be detailed in Chapter 03)»²⁸*

Macronutrient #2: Fat (Lipids)

Fats provide energy too. Still, where carbohydrates provide energy for instant use, fats are stored for future energy needs. Fats, or lipids, are broken down into fatty acids and glycerol and utilized in the body in different ways.

Like carbohydrates, fats are an essential part of the human diet. They are, primarily, necessary to absorb fat-soluble vitamins, as they help maintain body temperature and take part in cell growth and protection.

Is Fat the Culprit for Heart Diseases?

Carbohydrates consumption affects sugar levels in the blood. Fats or lipids have their impact on cholesterol levels in the blood instead, which may have created a link between fats consumption and risks of heart diseases and stroke.

In his book “How Not To Die,” Dr. Michael Greger has uncovered a very alarming connection between fat consumption and heart diseases. He wrote: *“Originally, researchers blamed animal fat or animal protein, but attention has recently shifted to bacterial toxins known as “endotoxins.” Certain foods, such as meats, appear to harbor bacteria that can trigger inflammation, even when the food is fully cooked. Endotoxins are not destroyed by cooking temperatures, stomach acid, or digestive enzymes, so after a meal of animal products, these endotoxins may end up in your*

intestines. They are then thought to be ferried by **saturated fat** across the gut wall into your bloodstream, where they can trigger an inflammatory reaction in your arteries.”²⁹

In addition, cooking food in oil that has surpassed its smoke point may cause the oxidation of oils and form certain pro-inflammatory and carcinogenic food substances. When food is oxidized or damaged this way, it can create reactive oxidative species. Also, the browning of food through the Maillard reaction may produce Advanced Glycation End Products (AGE), which, in the presence of fat in the arteries, may promote lipid peroxidation and the formation of plaque in vessel walls.

Still, and besides the cooking method (*which we will go through its impacts on food in Chapter 02*), health threats associated with fat consumption depend primarily on the quality of the consumed fats, which remarkably differs from one type of fat to another.

The Three Types of Fats: What to Take and What to Avoid?

Unsaturated fats, saturated fats, and trans fats are the three major types of lipids that can be contained in the food we eat:

1/ Unsaturated Fats

Unsaturated fats are lipids that are liquid at room temperature. Examples include *avocado oil*, *olive oil*, *peanut oil*, *vegetable oils*, like *corn oil*, and others such as *sunflower* and *canola oil*. Unsaturated fats can also be found in solid foods, such as *avocados*, *olives*, and *peanut butter*. Also, fatty fish like *salmon* and *mackerel*, *nuts* and *seeds*, such as *almonds*, *cashews*,

and *sesame seeds*, contain some amounts of unsaturated fats. These represent the safest and healthiest type of lipids.

Unsaturated fats are further classified into **monounsaturated** and **polyunsaturated**. But it is still a merely structure-based classification that has little to do with the excellent impact of mono- and polyunsaturated fats on health.

2/ Saturated Fats

These are lipids that are solid at room temperature. The list includes *cheese, butter, ice cream, red meat fats, dark poultry meat, coconut oil, and palm oil*. Saturated fats are supposed to be less healthy than unsaturated fats. It is suggested that saturated fats intake should be lowered to a safe range from 7% to 10% maximum to minimize the risk of developing heart disease.³⁰ However, some research found that medium-chain triglycerides (MCTs) represent a safer form of saturated fat. *Coconuts*, for instance, are a good source of saturated fats that are high in MCTs.³¹

3/ Trans Fats

Trans fats are liquid fats converted into a solid state during food processing techniques. There are **natural** and **artificial** trans fats. «*Unsaturated fats in plants eaten by ruminant animals undergo biohydrogenation via bacteria found in the animal's rumen. This process is natural and catalyzed by bacterial enzymes at normal body temperature and under normal body pressure. These trans fats make up 3–7% of the total fat in dairy products, such as milk and cheese, 3–10% in beef and lamb, and just 0–2% in chicken and pork. In contrast, industrial trans fats are formed when liquid vegetable oil is converted into a solid form through the chemical process of hydrogenation. This*

process is initiated by metal catalysts under enormous pressure at very high temperatures. Before they became widespread in the late 1940s, many of these trans fats had never been encountered in nature or existed only in trace amounts. »³²

Industrial trans fats represent **the worst type of lipids** that you want to avoid in all cases. These may be contained in commercially baked and fried foods made with vegetable shortenings, such as *fries* and *donuts*. It also exists in *hard stick margarine* as well as some snack and convenience foods such as *cookies, pies, cakes, crackers, and fried foods.*

Common Health Threat That All Types of Fats Impose

All foods containing lipids (fat molecules) are susceptible to **oxidation**. Changes in foods caused by lipid oxidation include the loss of nutrients, changes in color, and the formation of toxic compounds.³³ **Overheating the oil** (until it passes its smoke point) and **oil rancidity** (*caused when leaving oils out in a clear plastic or glass jar rather than an amber jar in a dark, cool cupboard*) contribute to lipid peroxidation and the formation of reactive oxygen species. Both of which may put the body in an inflamed state, cause cell damage, and increase its susceptibility to cardiovascular diseases.

Good Cholesterol and Bad Cholesterol

We have discussed different types of fats but haven't covered **cholesterol** yet. Cholesterol is a waxy, fat-like substance found in the cells of your body. The body naturally produces cholesterol, but consumption of animal products provides

additional amounts. Some of it is good, and some of it is unhealthy.

High-density lipoprotein (HDL) is a GOOD type of cholesterol that carries some low-density lipoprotein (LDL) away from the arteries back to the liver to be broken down and excreted. LDL represents the BAD type of cholesterol that creates fatty deposits in arteries, narrowing them and increasing the risk of stroke and heart attack.

Very low-density lipoprotein (VLDL) carries triglycerides to your cells instead of cholesterol. **Triglycerides** are the storage form of fat in the body, and a higher level increases the risk of stroke and heart attack. *Decreasing alcohol intake, cutting back on simple carbohydrates, increasing fiber consumption, as well as regular exercise* are all the actions you can take if you need to lower the triglyceride levels in the body.

Healthy Fat Intake

Dietary guidelines recommend minimally consuming 20% to 25% of calories from fat, while standard guidelines are 30-35%. Making sure that enough fat is consumed can prevent essential fatty acid deficiencies. *People with medical conditions affecting fat absorption, infants given formulas low in fat, and young children fed non-fat milk or adults following low-fat diets may experience symptoms such as dry, scaly skin, decreased growth in infants and children, increased susceptibility to infection, poor wound healing, as well as other visual problems and sensory nerve disorders; all due to essential fatty acids deficiency.*^{34 35 36}

► **T**akeaway #02

Fats (or lipids) are an essential part of a healthy diet. It is important, however, to steer clear of unnatural trans fats and saturated fats to a lesser degree, as they have proven harmful to your health.

Macronutrient #3: Protein

Protein is one of the three macronutrients that play significant roles in the body. Protein helps maintain a proper pH and fluid balance and build and repair tissues. Protein also contributes to a number of metabolic reactions, provides the body with a structural framework, and coordinates bodily functions.

There are 20 amino acids, but only nine are considered “essential,” meaning the body cannot produce them, and they must come from food sources. These essential amino acids are *leucine, methionine, isoleucine, valine, histidine, tryptophan, phenylalanine, threonine, and lysine*. Unless in some exceptional cases like in stress or illness, the other conditional amino acids are not essential as the body can construct them, either from scratch or by modifying others. Those are *arginine, glutamine, tyrosine, cysteine, ornithine, proline, serine, and glycine*.

Protein is an essential component for every cell in the body. It is also used to make enzymes, hormones, and many different types of cell signaling, as its constituents serve as building blocks for muscles, cartilage, ligaments, skin, and blood. Some common protein sources include *red meat, poultry, pork, fish, nuts, beans, seeds, and eggs*.

Proteins: Between Deficiency and Excess Intake

Protein is an essential nutrient in the human diet, and inadequate protein consumption has proved devastating to overall health. Protein deficiency is associated with a myriad of conditions, ranging from the waste and shrinkage of muscle tissues to impaired mental ability and a weak immune system.³⁷

³⁸ In particular, vegetarians and people following a strict plant-based diet are more likely to be at risk of protein deficiency, and they must make sure that they eat a wide range of plant-based proteins every day. Although tricky, it is still possible to cover your needs for protein from plant-based sources. Examples of plant-based protein-containing foods are *peanuts, chickpeas, tofu, tempeh, edamame, lentils, almonds, spirulina, quinoa, mycoprotein, chia seeds, flax seeds, hemp seeds, and beans.*

Yet, too much of anything is always bad. Excess protein intake also puts the liver and kidneys under strain as they have to detoxify and eliminate high quantities of protein by-products. To catch the midline between protein deficiency and excessive protein intake, the American National Academy of Medicine recommends consuming 0.8 grams daily for every one kilogram of body weight.³⁹ It means if you are 150 pounds (68.2 kilograms), you may achieve up to 55 grams of daily protein intake.

It's worth noting that carbohydrate intake will also increase with the consumption of vegetarian-based foods as there are very few vegan foods containing pure protein in the same amount of grams as, say, animal meat would. On that basis, meat could be an indispensable source of high-value animal protein. Therefore, it may be worth looking for a lean cut of meat with the lowest fat

content using marbling as a clue for a healthier option. (*to be detailed in Chapter 3*)

► **Fakeaway #03**

Instead of taking the risk of consuming endotoxins and saturated fat content found in animal fatty meat, you're better off meeting the minimum daily requirement of protein intake from other sources of protein such as nuts, seeds, beans, legumes, and protein-rich vegetables or from healthy fat-containing protein sources, consisting of different types of lean meat, seafood, and eggs. All, within the range of the recommended fats and carbohydrates intake.

Micronutrients:

Vitamins and Minerals

You might not feel it, but your body is one of the busiest and most active spots in the world! Part of the bones, skin, and muscles are produced throughout the day, while others undergo regular repair in a very accurate and systematic manner. Chemical messengers are formulated and shuttled between different organs. Nerve signals are exchangeably sent between the brain and body pathways, adding up to the continual digestion process of macronutrients and so much more.

For all this to be adequately performed, at least 23 different vitamins and minerals must be provided in adequate amounts. From one side, the body does not manufacture these laborers-like substances on its own, but it always needs new supplies from external sources. Additionally, these very important micronutrients are not always generously provided in nature, raising the challenge of achieving the minimum requirements for the micronutrient's daily intake.

Vitamins and minerals are so-called "micronutrients" since they are needed in just trace amounts in the body. Yet even these small amounts have significant importance as the next few facts may indicate:

- ⌚ Living for months without vitamin C sources causes a set of severe complications, ranging from extreme fatigue (the earliest sign of Scurvy) and gum

abnormalities (including gingival swelling, purplish discoloration, and hemorrhages) to a sudden death⁴⁰
⁴¹

- ⦿ Vitamin A deficiency may cause night blindness and severe infections and develop characteristic ocular problems known as “xerophthalmia” or “dry eye.”⁴²
- ⦿ Lack of vitamin D has been associated with rickets, a condition marked by soft, weak bones that can lead to skeletal deformities such as bowed legs.⁴³
- ⦿ Not getting enough calcium increases the risk of developing disorders such as osteoporosis, osteopenia, and calcium deficiency disease (hypocalcemia).⁴⁴

Medical records are full of fatal diseases and death cases associated with deficiency of vitamins & minerals. In order to avoid such a fate, aim for a diet that covers the most important vitamins and minerals. Find more details in the next table by Harvard Health Publishing (HHP).⁴⁵

Please, note that those “upper limits” appear in the table only concern vitamins and minerals taken from dietary supplements. Food sources provide trace amounts of these micronutrients, so there isn’t a big chance of exceeding the upper limits of vitamins & minerals intake within a regular well-varied diet of 2500 calories per day or less.

Vt / Mn	Benefits	RDI (upper limit)	Good Sources
Vt. A	Essential for vision. Lycopene may lower prostate cancer risk. Keeps tissues and skin healthy. Plays an important role in bone growth and in the immune system. Carotenoids act as antioxidants. Foods rich in the carotenoids lutein and zeaxanthin may protect against cataracts.	M: 900 mcg (3000 mcg) W: 700 mcg (3000 mcg)	<i>Beef liver, eggs, shrimp, fish, fortified milk, butter, cheddar cheese.</i> <i>Sweet potatoes, carrots, pumpkins, squash, spinach, mangoes, turnip greens.</i>
Vt. B1	Helps convert food into energy. Needed for healthy skin, hair, muscles, and brain and is critical for nerve function.	M: 1.2 mg W: 1.1 mg	<i>Pork chops, brown rice, ham, soy milk, watermelons, acorn squash.</i>
Vt. B2	Helps convert food into energy. Needed for healthy skin, hair, blood, and brain.	M: 1.3 mg W: 1.1 mg	<i>Milk, eggs, yogurt, cheese, meats, green leafy vegetables, whole and enriched grains and cereals.</i>
Vt. B3	Helps convert food into energy. Essential for healthy skin, blood cells, brain, and nervous system.	M: 16 mg (35 mg) W: 14 mg (35 mg)	<i>Meat, poultry, fish, fortified and whole grains, mushrooms, potatoes, peanut butter</i>
Vt. B5	Helps convert food into energy. Helps make lipids (fats), neurotransmitters, steroid hormones, and haemoglobin.	M: 5 mg W: 5 mg	<i>Wide variety of nutritious foods, including chicken, egg yolk, whole grains, broccoli, mushrooms, avocados, tomato products</i>
Vt. B12	Aids in lowering homocysteine levels and may lower the risk of heart disease. Assists in making new cells and breaking down some fatty acids and amino acids. Protects nerve cells and encourages their normal	M: 2.4 mcg W: 2.4 mcg	<i>Meat, poultry, fish, milk, cheese, eggs, fortified cereals, fortified soy milk</i>

	<p>growth Helps make red blood cells and DNA.</p>		
Vt. C	<p>Foods rich in vitamin C may lower the risk for some cancers, including those of the mouth, esophagus, stomach, and breast. Long-term use of supplemental vitamin C may protect against cataracts. Helps make collagen, a connective tissue that knits together wounds and supports blood vessel walls. Helps make the neurotransmitters serotonin and norepinephrine. Acts as an antioxidant, neutralizing unstable molecules that can damage cells. Bolsters the immune system.</p>	<p>M: 90 mg (2,000 mg) W: 75 mg (2,000 mg)</p>	<p><i>Fruits and fruit juices (especially citrus), potatoes, broccoli, bell peppers, spinach, strawberries, tomatoes, Brussels sprouts</i></p>
Vt. D	<p>Helps maintain normal blood levels of calcium and phosphorus, which strengthen bones. Helps form teeth and bones. Supplements can reduce the number of non-spinal fractures.</p>	<p>31–70: 15 mcg (50 mcg) 71+: 20 mcg (50 mcg)</p>	<p><i>Fortified milk or margarine, fortified cereals, fatty fish</i></p>
Vt. E	<p>Acts as an antioxidant, neutralizing unstable molecules that can damage cells. Protects vitamin A and certain lipids from damage. Diets rich in vitamin E may help prevent Alzheimer's disease.</p>	<p>M: 15 mg (1,000 mg) W: 15 mg (1,000 mg)</p>	<p><i>Wide variety of foods, including vegetable oils, salad dressings and margarines made with vegetable oils, wheat germ, leafy green vegetables, whole grains, nuts</i></p>
Vt. K	<p>Activates proteins and calcium essential to blood clotting. May help prevent hip fractures.</p>	<p>M: 120 mcg W: 90 mcg</p>	<p><i>Cabbage, liver, eggs, milk, spinach, broccoli, sprouts, kale, collards, and other green vegetables</i></p>

Calcium	Builds and protects bones and teeth. Helps with muscle contractions and relaxation, blood clotting, and nerve impulse transmission. Plays a role in hormone secretion and enzyme activation. Helps maintain healthy blood pressure.	31–50 age; M: 1,000 mg W: 1,000 mg 51–70 age; M: 1,000 mg W: 1,200 mg 71+ age; M: 1,200 mg W: 1,200 mg (2,500 mg)	<i>Yogurt, cheese, milk, tofu, sardines, salmon, fortified juices, leafy green vegetables, such as broccoli and kale.</i>
Chromium	Enhances the activity of insulin, helps maintain normal blood glucose levels, and is needed to free energy from glucose.	19–50 age; W: 25 mcg M: 35 mcg 51+age; M: 30 mcg W: 20 mcg	<i>Meat, poultry, fish, eggs, potatoes, some cereals, nuts, cheese</i>
Copper	Plays an important role in iron metabolism and immune system. Helps make red blood cells	M: 900 mcg W: 900 mcg (10,000 mcg)	<i>Liver, shellfish, nuts, seeds, whole-grain products, beans, prunes, cocoa, black pepper</i>
Iron	Helps hemoglobin in red blood cells and myoglobin in muscle cells ferry oxygen throughout the body. Needed for chemical reactions in the body and for making amino acids, collagen, neurotransmitters, and hormones.	19–50; M: 8 mg W: 18 mg 51+; M: 8 mg W: 8 mg (45 mg)	<i>Red meat, poultry, eggs, fruits, green vegetables, fortified bread and grain products</i>
Magnesium	Needed for many chemical reactions in the body. Works with calcium in muscle contraction, blood clotting, and regulation of blood pressure. Helps build bones and teeth	18+; M: 420 mg W: 320 mg	<i>Green vegetables such as spinach and broccoli, legumes, cashews, sunflower seeds and other seeds, halibut, whole-wheat bread, milk</i>
Manganese	Helps form bones. Helps metabolize amino acids, cholesterol, and carbohydrates.	M: 2.3 mg (11 mg) W: 1.8 mg (11 mg)	<i>Fish, nuts, legumes, whole grains, tea</i>
Molybdenum	Part of several enzymes, one of which helps ward off a form of severe neurological damage in	M: 45 mcg W: 45 mcg (2,000 mcg)	<i>Legumes, nuts, grain products, milk</i>

	infants that can lead to early death.		
Potassium	Balances fluids in the body. Helps maintain steady heartbeat and send nerve impulses. Needed for muscle contractions. A diet rich in potassium seems to lower blood pressure. Getting enough potassium from your diet may benefit bones.	M: 4.7 g W: 4.7 g	<i>Meat, milk, fruits, vegetables, grains, legumes</i>
Sodium	Balances fluids in the body. Helps send nerve impulses. Needed for muscle contractions. Impacts blood pressure; even modest reductions in salt consumption can lower blood pressure.	M: 2,300 mg W: 2,300 mg	<i>Salt, soy sauce, processed foods, vegetables</i>
Zinc	Helps form many enzymes and proteins and create new cells. Freees vitamin A from storage in the liver. Needed for immune system, taste, smell, and wound healing. When taken with certain antioxidants, zinc may delay the progression of age-related macular degeneration.	M: 11 mg W: 8 mg	<i>Red meat, poultry, oysters and some other seafood, fortified cereals, beans, nuts</i>

Water: Water: The Most Important Nutrient in Nature.

“We never know the worth of water until the well is dry.”

— Thomas Fuller

As a major part of the ecosystem, water is an essential element for the survival of every living organism on the planet. For humankind, water makes up around 60% of the human body and forms the basis of blood and digestive juices. According to the USGS, « **the brain and heart are composed of 73% water**, and the **lungs are about 83% water**. The **skin contains 64% water**, **muscles and kidneys are 79%**, and even the **bones are watery: 31%»**⁴⁶

As a nutrient, water has a lot to do for the body. It keeps the bloodstream liquid enough to flow through blood vessels, helps eliminate the byproduct of the body's metabolism, regulates the body temperature through sweating, moistens mucous membranes such as those of the lungs and mouth, and it lubricates and cushions joints. In pregnancy, water serves as a shock absorber inside the eyes, spinal cord, and the amniotic sac surrounding the fetus.

If you don't drink enough water, you become dehydrated. Dehydration symptoms include lack of concentration, lethargy, dizziness, light-headedness, dry mouth, increased thirst, dark yellow urine, and urinating less than four times a day.

Water is classified as a micronutrient only for the reason that it does not provide the body with any supplies of energy. However, while you may survive for a few weeks without new food supplies, you can only survive for three days or 72 hours without water. I thought more than twice before I found the gut to share this, but here is what could be a life-saving tip: Note that if you happen to find yourself in a survival situation where you have no accessible sources of water, drinking your own urine during this time may keep you alive for another day or two.

Watch Out for Signs of Dehydration

If you don't drink enough fluids, especially after vigorous activity, there is a potential risk of getting heat stroke or shock, which occurs when low blood volume causes a drop in blood pressure and subsequently a drop in the body's amount of oxygen. Furthermore, the absence of water entering the urinary system can cause urinary tract infections, kidney stones, and even kidney failure. Other dehydration symptoms include a dry mouth, lips, and eyes, lethargy, dizziness, and light-headedness.⁴⁷

⁴⁸

Infants and children are highly susceptible to severe dehydration, partly due to their inability to communicate their thirst and not paying attention to the thirst signal. Therefore, it is the adults' job to watch out for them. Also, with age, the body's fluid reserves decrease as your ability to conserve water is reduced, and your sense of thirst becomes less accurate.

Generally, the U.S. National Academies of Sciences, Engineering, and Medicine suggest a water intake of 3.7 liters (15.5 cups) per day for men and 2.7 liters (11.5 cups) per day for women.⁴⁹ Others recommend a rough estimate of half your body

weight converted to pounds in ounces of water. Actually, the quantity of water needed varies from person to person. Specifically, the amount depends on your health needs, your level of activity, the type of foods you eat, as well as your ambient temperature. Therefore, the best and most accurate way to find out how much water you need is by knowing how much you've lost. It is something you can always track using the urine color as a clue: the darker it is, the more water you need.

Transparent	You might be drinking more than you need. It's ok to cut down a little bit.
Light yellow	You are well-hydrated .
Yellow	You're hydrated but could use about 4-10 ounces of water.
Dark yellow, amber, or honey	You're dehydrated , and you need to drink more water.
Brown, or darker	You're facing severe dehydration . Drink water right away.

There are also other rarely occurring urine colors, mostly indicating unique medical conditions.⁵⁰

Pink to Reddish	It can come from foods you've eaten (beets, blackberries, pink dragonfruit, and rhubarb) due to certain medications, or it may indicate blood in the urine, or it may be a sign of another medical condition.
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Blue or Green	Some brightly colored food dyes or certain medications can cause green urine. If not, it could be a sign of a rare disease.
Dark brown or cola-colored	This urine color can result from food (fava beans, rhubarb, or aloe), medications, medical conditions, or a muscle injury from extreme exercise.

Types of Water: Drink the Best Water While You Can

It could be a surprising fact that you know for the first time in life, but just like wine, water has many forms, tastes, consistencies, and densities differentiating among a variety of types to choose from:

1/ Tap Water

The local government authorities control tap water that comes out of the faucet. Tap water is generally safe for cooking and cleaning. However, recent studies, such as the EWG's 5-year study, have raised cause for concern about tap water quality for human consumption.⁵¹

2/ Spring Water

Spring water is natural water collected from underground sources. Spring water delivery services are usually in charge of collecting naturally alkalized water directly from its source. There is no alteration or addition made to the spring water. Thus, you can consume this water directly from nature. Just make sure the source is consistently tested to ensure that it is pure and free of contaminants and bacteria.

3/ Mineral Water

Mineral water is water from a mineral spring that contains up to four times as much calcium and magnesium as regular tap water. It may also contain other various minerals, such as chloride and sulfur. It may be classified as “still” or “sparkling” (carbonated/effervescent) based on the presence or absence of added gases. Mineral water is also associated with low blood pressure.⁵²

4/ Filtered Water

There are three main types of water filtration. These are distilling, carbon filtration, and reverse osmosis filtration systems. When we filter our water in any way using carbon filtering, distilling, or reverse osmosis, we are removing all solutes, including irons and other minerals:

- Distilled Water:**

Also sometimes called deionized or demineralized water, this one represents the purest form of water, where it has all substances and impurities removed, including all of the good minerals and ions as well as contaminants and bacteria.

Distilled water is usually the best choice in factories and laboratories, owing to its high level of purity. It is still safe for human consumption but can draw minerals from the body, causing bone and tooth demineralization.

- Carbon Filter:**

This type of filtration system works by means of adsorption. Activated carbon works by trapping pollutants due to its large surface area. Activated charcoal capsules are also used for food poisoning and drug overdoses as they stop the absorption of these substances in the body.

- **Reverse Osmosis Filter:**

This form of filtration works to remove contaminants through the use of pressure through a semipermeable membrane. This reverse osmosis membrane acts to move water from one concentrated area to a less concentrated area, producing filtered, clean water. This is the most expensive filtration system but the most effective.

5/ Hydrogen Water

This is the most expensive type of water available. Hydrogen water undergoes special treatment, where hydrogen molecules are added to water, aiming to enhance its health benefits. It is claimed that hydrogen-rich water has great effects with its antioxidant and anti-inflammatory features. In individuals with metabolic syndrome, it is found to boost the body's antioxidant activity.⁵³

Bottles or cans of hydrogen water can be purchased in stores, or it can be homemade using specialized generating machines.

6/ Bottled Water

Bottled water can simply be any water that is stored in a bottle. «In Canada, retail sales of bottled water were forecast to reach around 4.46 billion US dollars in 2022. This would be an increase of around 16 percent since 2018 when retail sales stood at approximately 3.83 billion US dollars.»⁵⁴ This is by far the biggest marketing scheme that has detrimental impacts on our environment. The plastic in our environment is ending up in our food and bodies. Any preventative measures we can take to minimize plastic waste should be taken. By buying our own multi-use bottles and our own filter, we can significantly reduce this environmental threat.

Plastics are extremely difficult to recycle, so they usually end up in the environment resulting in pollution-related threats to our marine and wildlife. According to the Pacific Institute, «approximately 17 million oil-equivalent barrels were needed to produce the plastic water bottles consumed by Americans in 2006—enough energy to fuel more than one million cars for a year.»⁵⁵

7/ Zamzam Water

Faima Bakar, a lifestyle reporter, wrote in the UK newspaper Metro: “We've heard of air purifying, drinking Kombucha, and using essential oils, all in the name of wellness and making our lives a little bit better. And we think the next wellness trend might be ~ wait for it ~ water. But not just any water, holy water, specifically Zamzam water.”⁵⁶

Zamzam water is the holy water for Muslims that springs from Zamzam well in Mecca, KSA. According to the Islamic tenet, the history of the holy well dates back to thousands of years ago, when Hajar, Prophet Ibrahim's wife, and her baby son Ismail were stranded in the dry valley of Mecca. After running desperately for seven times back and forth between the two hills of Safa and Marwah, looking for a water source to quench her and the baby's thirst, Hajar fell on her knees from fatigue and exhaustion and sat the baby close to her. At the time, Ismail rubs the land with his little feet, and suddenly water starts flowing from the place.

A lot has been said about Zamzam water; Not only about its holiness, but the water's miraculous properties attracted researchers to uncover the secret behind some stories revealing its effectiveness in treating incurable diseases like cancer and that it can even replace other important nutrients. Nevertheless, more objective research and studies are still needed to prove

Zamzam's unique features and benefits from a neutral scientific standpoint.

► Takeaway #04

The term “micro-“ in “micronutrients” has little to do with how important the nutrient is. Vitamins & Minerals are called so only because they are needed in trace amounts, and water because it is a nutrient that doesn't provide energy. Other than that, these so-called “micronutrients” are fundamentally essential for the proper functioning of the body systems.

Make sure your diet covers all the essential vitamins and minerals, and make good use of the urine-color clue to control your fluid intake and stay well-hydrated.

Here is the last takeaway: consider having a warm glass of water first thing in the morning. Warm water has shown greater improvements in digestion and overall health benefits than regular cold water.⁵⁷

CHAPTER

2

The 6 Most Common Food Processes: *How to Maximize Their Benefits and Minimize Their Harmful Effects*

As far as Chapter 01 has determined, the quality of any food we eat is evaluated based on its content of essential nutrients, including *fiber, unsaturated fats, proteins, and essential vitamins and minerals*, versus its lack of other harmful ones like refined *carbohydrates, sodium, and trans fats*. That basis of evaluation, however, can only be relied upon when foods in their primary forms are under the microscope.

These names of different foods that we know only refer to the initial food status. Once the initial food properties get exposed to any change, the name changes accordingly; Just like the name “meat” becomes “frozen meat” once some of its initial properties change during the process of freezing.

Apart from freezing, food products may be exposed to several processes that affect their quality in different ways, the fact of which would extend the terms of evaluation beyond the safety and healthfulness of the contained ingredients to involve

a careful check on all the changes that would take place in food during the different **processes**.

Process #1: Freezing

Freezing is a quick and convenient way of food preservation that involves storing food at a thermal condition around 0° F using any freezer system. The seemingly helpful technique has always been associated with reputation-shaking news concerning its effects on nutrient content and the general quality of the particular food product.

The case is that fresh or recently harvested food contains certain enzymes that cause changes in flavor and color and a loss of nutrients over time after the vegetable or the fruit is reaped. By putting the food in freezing conditions, we inactivate these enzymes to stop such reactions and prevent food spoilage. But, the question is:

What Effects Does the Freezer Have On the Food Quality?

First, most fruits and vegetables contain significant amounts of water held within the relatively solid cell walls that support the structure. When this water freezes, it expands automatically, and ice crystals cause these walls within the cell to rupture. As long as it is in the freezer, these ice crystals maintain the food hardness, but when thawed, the support weakens and softens the texture.⁵⁸

Next, the migration of water vapor from the product to the surface of the containers and the extent of cell wall rupture can be, somehow, another unwanted consequence. Yet, the major problem associated with freezing vegetables is the development of brown colors and the loss of water-soluble vitamins, like vitamin C.⁵⁹ This mostly occurs during blanching—a pre-freezing procedure to stop enzyme actions in vegetables. Fruits are less likely to experience such a loss in vitamins as they don't undergo the blanching process. However, the composition of some other antioxidant components and the antioxidant activity of the fruits are still likely to be affected.⁶⁰

According to the American National Center For Home Food Preservation, « blanching (*scalding vegetables in boiling water or steam for a short time*) is a must for almost all vegetables to be frozen. It stops enzyme actions which can cause loss of flavor, color, and texture. »⁶¹ Unfortunately, water-soluble nutrients such as vitamin C and all B vitamins are lost into the water in which the produce is submerged.

Also, all lipid-containing foods are susceptible to oxidation. Changes in foods caused by lipid oxidation include nutrient devalue, loss of color, and the formation of toxic compounds.⁶²

Eat It as Long as It Is Safe, but Don't Live on It.

The other thing to be concerned with when freezing food is the so-called “freezer burn” that occurs when frozen food loses its moisture due to poor wrapping or the very long storage, which badly affects the essential food properties. Food that has undergone freezer burn is safe to eat, although good taste and texture are not guaranteed.

Ultimately, the freezer is a safe place to store food: « *Food stored constantly at 0 °F will always be safe. Only the quality suffers with lengthy freezer storage. Freezing keeps food safe by slowing the movement of molecules, causing microbes to enter a dormant stage. Freezing preserves food for extended periods because it prevents the growth of microorganisms that cause both food spoilage and foodborne illness,* » The USDA declares.⁶³

Undoubtedly, fresh foods come with better quality than frozen foods even though the product is equally safe in both cases. Still, frozen food loses the lowest proportion of nutrients and maintains the maximum of its original quality if stored right after it is harvested (or immediately after it is brought from the local market), and also if you consider:

- ✓ limiting air during freezing by wrapping products and removing air from the freezer container or bag to avoid freezer burn.
- ✓ Never overload the freezer with unfrozen products, for it results in a long, slow freezing, and poor quality product.
- ✓ Never surpass storage time—that is the time the particular food should remain in the freezer. It differs from one product to another, as shown in the following table set by the USDA⁶³:

CATEGORY	FOOD	STORAGE TIME
Salads	Egg, chicken, tuna & macaroni salads	Does not freeze well
Hot dogs	Opened package	1 to 2 months
	Unopened package	1 to 2 months

Luncheon meat	Opened package or deli sliced	1 to 2 months
	Unopened package	1 to 2 months
Bacon & Sausage	Bacon	1 month
	Sausage, raw—from chicken, turkey, beef	1 to 2 months
Hamburger & Other ground meats	Hamburger, ground beef, turkey, veal, lamb & mixtures of them	3 to 4 months
Fresh beef, veal, lamb	Steaks	6 to 12 months
	Chops	4 to 6 months
	Roasts	4 to 12 months
Fresh poultry	Chicken or turkey, whole	1 year
	Chicken or turkey, pieces	9 months
Soups & Stews	Vegetable or meat added	2 to 3 months
Leftovers	Cooked meat or poultry	2 to 6 months
	Chicken nuggets or patties	1 to 9 months
	Pizza	1 to 2 months

► **Takeaway #05**

Doubtless, fresh food products come with better quality than their frozen counterparts as they provide a higher nutrient value, better texture, and original flavor. Nevertheless, if frozen under the right measures, frozen foods are still safe to eat and have shown no negative impact on overall health.

Process #2: Deep-frying

Deep-frying is technically a dry heat cooking process where food is immersed in a deep vessel of hot oil. Popular fried foods include battered fish, potatoes, battered chicken strips, and cheese sticks. Still, just about everything can be deep-fried.

What Has Granted Fried Food Its Bad Reputation?

Deep-frying comes with a small loss of minerals and a moderate loss in vitamins and antioxidants.⁶⁴ But what has mainly made deep-fried foods not recommended on a regular basis boils down to two things: **1/** the increase of calorie intake and **2/** the rise of trans fats content during the process.

When food is fried in oil, it loses water and absorbs fat, which significantly increases its calorie content. While one small baked potato of 100 grams contains 93 calories and 0 grams of fat, the same amount (100 grams) of French fries contains 246 calories and 17 grams of fat.

Also, cooking oil at high temperatures may slightly increase its trans fat content every time the same oil is used and reused for frying.^{65 66}

Deep-Fried Food Is to Be Minimally Consumed

In 2015, the National Center for Biotechnology Information published a review of the current evidence on the association between fried food consumption and cardiovascular diseases, diabetes, hypertension, and obesity to recommend directions for future research. The review was concluded that *« there is strong evidence suggesting an association of fried food consumption with a higher risk of developing chronic disease in adults. The strength of current evidence makes it reasonable to recommend complete avoidance of fried foods or at most infrequent to moderate fried food consumption within the context of an overall healthy dietary pattern. »⁶⁷*

Will Using a Good Frying Oil Solve the Problem?

Yes, it will do to some extent!

Frying occurs in the presence of three main components: food, oil, and the process itself. Sometimes, frying might be as unhealthy as the oil used for frying or the food being fried, like in the case of fried Twinkies or fried cheesecake, as an example. If the food or the frying oil is originally unhealthy, we don't need to bring the frying process under the spotlight.

When it comes to the oil used for frying, monounsaturated and polyunsaturated fats, including *canola, corn, sunflower, peanut, soybean, and olive oil*, should be better than solid fats such as *butter, shortening, lard, and hard stick margarine, or tropical oils*, which may contain considerable amounts of saturated fat.

According to Harvard Medical School, a recent Spanish study suggests that the type of oil used to fry food does affect the

frying process. In this study, foods that were fried in healthy vegetable oils, such as olive oil, did not raise the risk of heart damage or clogged arteries.⁶⁸ Making some changes to the type of oil does provide safer and healthier fried food. Yet, NOT healthful because changing the oil type doesn't solve the rest of the deep-frying issues: The oil still absorbs nutrients from food, and it still adds the same amount of calories!

Process #3: Air-Frying

Air frying is simply the process of frying food in an air fryer. An air fryer is a convection oven that relies on hot air rather than hot oil to fry food. It does so by circulating rapid, superheated air around the food to make it crisp—much like deep-frying, but without using the same amount of oil.

Sounds Healthier, Doesn't It?

Air-fried foods are claimed to serve as a health-friendly alternative to deep-fried foods, owing—you guessed it—to their lower content of fats, of course. With a single tablespoon of oil, you can achieve the same texture and taste of traditional deep-fried food that is completely submerged in oil. That being the case, all health threats associated with frying, including nutrient absorption and the increase in calorie and trans fat content, may be solved. However, the browning that still occurs, much like in deep frying, could still be an issue. As food browns, the amount of reactive oxidative species and advanced glycated end products increase.

A Potential Drop in Fat Intake

One of the apprehensions reported among the community concerning the switch into air-frying was the sudden, significant decrease in fat intake within a regular diet.

As we clarified in the previous chapter, it is the source of fats that matters the most. Food containing monounsaturated and/or polyunsaturated fats are the best sources of lipids. As long as there are several ways to include these nutrients into the

diet, there is no need to put ourselves at the risk of consuming deep-fried foods.

If you want to keep your healthy intake of fats in check, the recipe of **olive oil and figs** could provide a great option. Although the mixture has not yet been studied to provide an evidence-based conclusion regarding its effectiveness, advocates believe in its effect in helping with anemia, high cholesterol, constipation, stomach problems, and fertility. From a neutral standpoint, we know olive oil is one of the best sources of unsaturated fat, and fig is a fiber-rich fruit, a high source of potassium with 242 mg/100 g, and a good source of calcium with 35 mg/100 g. So, it would still help in other ways, nonetheless.

Cut high-quality dried figs into smaller pieces and put them in a jar. Then pour olive oil so that every piece of fig is fully submerged in the oil. Leave the well-covered jar in a dark place for figs to absorb the maximum amount of olive oil. Then, you may get accustomed to starting your morning with a few pieces of figs every now and then.

► **Fakeaway #06**

Air-fried foods may serve as a convenient and healthier alternative to their deep-fried counterparts.

Process #4:

Microwaving

« Microwaves are a type of electromagnetic radiation, as are radio waves, ultraviolet radiation, X-rays, and gamma-rays. Microwaves have a range of applications, including communications, radar, and, perhaps best known by most people, cooking. »⁶⁹

Affordable microwave ovens for residential use were introduced in the 1970s. The ease of use and timed nature, especially in a fast-paced society, have fueled the popularity of microwave ovens in every household. They provide an effective, fast, time-saving method for cooking and defrosting. However, there has been great concern about a potential health threat surrounding their use of electromagnetic waves since they were first introduced as a new alternative to conventional ovens.

What Are Radio Microwaves?

Electromagnetic radiation is energy that passes through free space. If you turn on the light in a dark room, you are taking advantage of electromagnetic radiation issued by the lamp. Microwaves are just another type of electromagnetic radiation, but other than lighting the space—*as the lamp serves*—microwaves are known to give heat when penetrating food materials.

Microwave ovens work by forcing food molecules to rotate using a 12-centimeter microwave. The interaction of these

molecules undergoing forced rotation creates enough heat to change food from raw to cooked state. This is why microwave heat usually has little to do with the food containers; if these materials feel warm, it's only from being in contact with the hot food itself.

Hazardous Impacts on You, Not on Your Food

Explaining their concern about the effects of microwaves on human health, the National Center for Biotechnology Information announced: « *With the intensive development of various advanced military weaponry equipment, such as early warning aircraft, electronic jammers and new radar, soldiers are always exposed to intricate environmental factors, including intensive and complex MW radiation. As the fourth largest source of pollution after air, water and noise, MW radiation induces many biological effects. The brain is the most sensitive target organ for MW radiation, where mitochondrial injury occurs earlier and more severely than in other organs. Studies on the effects of MW radiation on brain energy metabolism have aroused great concern.* »⁷⁰

Well, don't get it all wrong. This is concerning when the human body is directly exposed to microwaves. Otherwise, they are supposed to impose no harmful change on food during the process. Food cooked in a microwave oven is safe and has the same nutrient value as food cooked in a conventional oven. « *When used according to manufacturers' instructions, microwave ovens are safe and convenient for heating and cooking a variety of foods. However, several precautions need to be taken, specifically with regards to potential exposure to microwaves, thermal burns*

and food handling, » according to the World Health Organization.⁷¹

► Takeaway #07

Microwaving, which involves exposing food to electromagnetic radiation in the microwave frequency range, is a safe and convenient method of cooking.

When microwaving your food,

- ✓ *You should not use traditional metal cookware for microwaving, as these waves cannot penetrate through metal to cook food.*
- ✓ *Forgo making recipes that require a lot of water, such as pasta, in a microwave as they do not cook well.*
- ✓ *Cover the dishes to eliminate splatter and cut down on cooking time.*
- ✓ *Cut foods into small pieces if possible, as small pieces cook more quickly and thoroughly than large ones.*
- ✓ *Avoid heating in square containers, for the corners tend to receive more energy and, thus, cook food (or food surfaces) unevenly.⁷²*
- ✓ *Do not thaw frozen meats, especially fish, in the microwave, as this can impact the quality of meat.*

Process #5: Braising

Braising is a slow method of moist heat cooking. In braising, food is cooked with a moderate amount of liquid in an oven at a temperature around 95°C (about 200°F) using a covered pot. Whole fish, cuts of meat, poultry, brisket, vegetables such as celery, fennel, leek, cabbage, cauliflower, artichokes, and so many other foods are suitable for braising. Tomato juice, broth, wine, or even plain water make valid braising liquids. Even some seasonings and aromatic vegetables like onions and carrots are often used along with the braising juice.

Braising, as with any other cooking method (except for steaming), causes a certain decrease of total soluble proteins, chlorophyll, and vitamin C.⁷³ Also, some other nutrients might end up seeping out into the cooking liquid in the case of braised meat and vegetables. However, since the broth is served alongside the dish, this should not be much of a problem.

Braising or Stewing?

Braising and stewing represent almost the same method of cooking. There is very little differentiation concerning the way the food is treated before and during the two processes. While “braising” involves cooking whole food (*a whole cut of meat or a piece of chicken*), stewing is the moist heat method that involves cooking small, cut-up pieces of food. Also, the other thing is that

in stewing, food is usually sautéed or browned first at a high temperature before it is put into the covered pot with vegetables and the stewing liquid.

Braising vs. Roasting

Roasting is the dry method of cooking where hot air surrounds the food to have each side of it evenly cooked. Roasting is typically performed in an open, uncovered pan, while braised items may be covered.

More importantly, roasting requires a higher temperature (400°F and above) to create a browned, flavorful crust on the food being cooked. Higher temperature means greater loss of important micronutrients (such as vitamin C and B vitamins).

Braising vs. Grilling

Grilling is a quick cooking method that applies dry heat directly to the food surface, either from above or below or both. The common cooking method known as “broiling” is one form of grilling.

Grilling doesn't add any fats or calories to food, as long as no marinades, oils, or other sauces are added. Better still, some of the fat in the food seeps out, which results in a final product with fewer calories and less fat content.

On the negative side, grilled food might contain heterocyclic amines. These carcinogen substances can be potentially released when the high heat of grilling interacts with the proteins in meats. Still, the dripping removal and smoke removal treatments in the grilled meat were found to reduce up to 89% of these components.⁷⁴

We can conclude that everyone with no exceptional health conditions can enjoy grilled food at occasional BBQ parties and gatherings. Grilling, however, is just not the best method for everyday cooking.

Process #6: Steaming

As *the name refers*, steaming is the cooking method that depends on boiling water continuously until it vaporizes as steam, providing the necessary heat to cook the food above.

Steaming is one of the healthiest techniques to transform your food from raw to cooked state, for it preserves nutrient value and adds no calories, fats, or any other component. It gives you the chance to experience the unique flavors of the food itself and take more advantage of its original vitamins, minerals & enzymes, which would otherwise leach out into the cooking oil or cooking liquid. Furthermore, steaming softens fibers in vegetables and fruits, making them easier for the body to absorb and digest.

With all these upsides and benefits, steaming is the cooking method that should be worth all the thumbs up. The only drawback regarding steaming is that it does not produce enough heat to cook large pieces of meat, such as beef. Unfortunately, we are limited to steamed fish or steamed poultry besides steamed fruits and vegetables.

Steaming vs. Boiling

In steaming, the hot steam of the boiling water provides the heat to cook food, while the boiling method involves the full submersion of food into the liquid. At the level of healthfulness,

steaming provides more benefits than boiling. As mentioned previously, steaming food retains the maximum value of vitamins, minerals, and enzymes that would partially seep out into the cooking water during the boiling process. Boiling is associated with the loss of total carotenoids. Therefore, *steaming is the best overall method* of achieving the cooked state of a particular array of foods.

Boiling vs. Poaching

Compared to boiling, poaching is a much gentler method for cooking delicate foods such as white meat, seafood and fish fillets, eggs, as well as certain fruits and vegetables. Poaching involves submerging the food in a liquid—*water, chicken stock, white or red wine*—at a low temperature between 70°C and 80°C.

Maintaining that temperature just below the boiling point is the challenging part of the process, and it usually requires an instant-read thermometer and a very careful treatment.

Just like steaming does, poaching makes the food easily digestible, which is a huge plus. But the technique originally owes its good reputation to the use of liquid vs. fat in the preparation of some foods such as eggs, which provides an excellent healthy alternative for people who need to reduce their fat intake to match some of their medical or personal needs.

► **Takeaway #08**

The way you treat and prepare your food usually makes a big difference in the food quality and its impact on your overall health.

By the end of Chapter 02, you should know now how to safely store and microwave your food products for the maximum benefits and the minimum risks.

Among many cooking techniques, steaming is the safest and the healthiest option so far. Since not all foods can be steamed, you may go for braising or stewing for everyday cooking. But never mind breaking the routine with some delicious roasting recipes from time to time or enjoying grilled meat occasionally.

Once you miss the crispy taste of fried food, the air-fryer is there to provide safer and healthier French fries or chicken nuggets.

Finally, in case you want to make an egg with the minimum amount of fats, you know how to take advantage of the poaching technique for that sake.

CHAPTER

3

How to Opt For the Best Quality and Never Fall For Crafty Marketing Techniques at the Supermarket

It is no secret that supermarkets have long been studying customer behaviors to build a set of successful marketing techniques in the hope of increasing sales and boosting profits. Once you set foot in a supermarket, you find yourself trapped within a very inviting space, surrounded by all kinds of temptations. Items at eye level are more name brand and will usually cost more than the bottom shelf items. Colorful boxes are put within reach of children. End caps attract your attention, while they may not always be the best deal for you.

Even if you think you hold certain authority over your choices there, even with a grocery list made ahead of time, chances are you'll still succumb to wisely applied marketing tactics. An average consumer's possibility to emerge victorious is very tiny because it is the marketers' battlefield, and it is their job they are getting paid for. They would make good use of their expertise to sell the product THEY want by giving it a look YOU

want through a crafty investment in your lack of knowledge in the area.

Under these circumstances, the mother farm should make a reliable sanctuary. Turning to local farms to get the necessary food products (*fruits and vegetables*) or home-making some at the kitchen (*like making homemade mayonnaise*) can be a significant step towards decreasing the monthly market visits and, thus, getting more control over what is served at your dining table. However, if there is no alternative but to get into this marketing battle in the supermarket, just get armed with the next rules before you dare to accept the challenge.

Step 01: Decrypt the Font Package Messages

Rule #1:

Avoid “Improved” Versions of Original Products

<< Beef, Water, Contains 2% or less: Corn Syrup, Flavorings, Salt, Dextrose, Potassium Chloride, Modified Food Starch, Maltodextrin, Hydrolyzed Soy Protein, Sodium Phosphate, Paprika, Sodium Ascorbate, Sodium Nitrite, Extract of Paprika. >>

'Ingredients list' of fat-reduced beef product

To offer dietary products that are in line with the general concept of the term “healthy,” manufacturers have launched a large-scale campaign to produce healthier versions of their products. The campaign ended up with new words labeled on the product cover, such as 'light,' 'low fat,' and 'fat-reduced.' Still, in the end, they turned out to be nothing more than an array of misleading words that rather mean the product is not healthy.

If you happen to spot such eye-catching words written in large-sized font, leave the product on the shelf.

Why?

Mainly for two reasons: 1/ To interfere and change the content of the original components of a particular product, *whether through the reduction or the enhancement of a particular*

ingredient, generally, it must undergo more technical processes to shape up, leading to a highly-processed product. And 2/ By eating a product, where one of its original nutrients is eliminated or reduced, you'll have to face the inevitable by consuming too much of another nutrient instead: while in order to achieve low- and non-fat final product by way of instance, sugar is boosted to make up for the loss of flavor, along with other flavor enhancers.

As in the sample above, we can spot “corn syrup” among the ingredients list of ‘fat-reduced beef.’ Corn Syrup is a type of sugar that doesn’t naturally occur in beef, so how did the ingredient get there?!

► ***Takeaway #09***

Manufacturers seldom get to affect certain product quality in a positive way. Usually, the attempt will only make things worse. Therefore, you are better off eating the real food with its pros and cons in moderation than relying on its seemingly healthier, processed counterparts.

Step 02: Move On to the Ingredients List

Rule #2: Apply the ‘First Three’ Rule

<i><< Carbonated Water, Sugar, Caramel Colour (E150d), Phosphoric Acid, Caffeine, Natural Flavourings >></i>	<i><< Popping Corn, Palm Oil, Salt, Less than 2% of Butter, Natural Flavoring, Color Added, TBHQ and Citric Acid >></i>
The ingredients list of a carbonated soft drink product	The ingredients list of a popcorn product

The ingredients on any product are listed in descending order by weight, which means the first three ingredients make up the bulk of the product.⁷⁵ If you find 'salt' or 'sugar' among these first three, you are typically not getting the best nutrient-dense product.

Just Watch for the Other Forms of the Same Ingredient

(Anhydrous dextrose, Dextrose, High-fructose corn syrup (HFCS), Lactose, Malt syrup, Maltose, Pancake syrup, Sucrose, Nectars, Disodium guanylate (GMP), Disodium inosinate (IMP), and Sodium). Those are all forms of the same ingredients (either sugar or salt) that might be listed instead of the real names as a

desperate attempt to hide the unwanted ingredients from consumers.

This is so challenging! But you are never required to remember all these perplexing names before you can make the best choice. Instead, play that simple eliminating game: Once the first three ingredients are not intelligible or don't look familiar, don't hesitate to put the item back on the shelf.

Rule #3:

Avoid Food Products Where the Main Ingredient Is Not Listed Among the First Three in the Ingredients List

<i><< Apple, Pear and Grape juices from concentrate, less than 2% of: Pineapple juice from concentrate, Natural Flavors, Calcium Citrate (Calcium Source), Vitamin C (Ascorbic Acid), Citric Acid (Provides Tartness), Potassium Phosphate>></i>	<i><< Pure Filtered Water, Sweeteners (High Fructose Corn Syrup, Sugar), Pear, Cranberry, Apple and Raspberry juices from concentrate, less than 1% of: Natural Flavors, Citric Acid, (provide tartness), Vitamin C (Ascorbic Acid), Grape skin extract (for color) >></i>
P 001	P 002

Both of those products are labeled as “fruit juice.” However, only one product seems to suit the claim!

P 001 lists first: *Apple, Pear, and Grape Juices from concentrate and Pineapple Juice From Concentrate*. This means apple juice makes up the bulk of the product, and grape juice and pineapple juice are contained in lesser quantities.

P 002, on the other hand, lists *pure filtered water and sweeteners (HFCS and sugar)* as the first two items. Fruits, however, come next with less quantity. Truly, no matter how good or bad it tastes, the name “Sugary Water Drink” should better suit this second product. Although, the existence of the

very bad HFCS sweetener is fairly enough reason to reject the item in the first place.

Fruit Juice vs. Fruit Drink vs. Fruit Nectar

“Fruit juice,” “fruit drink,” and “fruit nectar” do not refer to the same product. If the label on the product says “fruit drink,” it means the product was not manufactured under any limitation standards. It is mostly water, with a small amount of fruit juice and no limits on sugar content.

“Fruit nectar” is « the unfermented but fermentable product obtained by adding water with or without the addition of sugars, honey and/or syrups, and/or food additive sweeteners or to a mixture of those products. Aromatic substances, volatile flavor components, pulp and cells all of which must be recovered from the same kind of fruit and be obtained by suitable physical means may be added. »⁷⁵

“Fruit juice” is « the unfermented but fermentable liquid obtained from the edible part of sound, appropriately mature and fresh fruit or of fruit maintained in sound condition by suitable means including post-harvest surface treatments. Fruit juice is obtained, whether as:

“Fruit juice” directly expressed by mechanical extraction processes. Or

“Fruit juice” from concentrate by reconstituting concentrated fruit juice. »⁷⁵

Rule #4:

The Same Thing With Products That Have No Main Ingredient

<< Water, corn syrup, sugar, citric acid, natural flavors, sodium citrate, sodium benzoate and potassium sorbate (to preserve flavor), cellulose gum, polysorbate 60, gum Arabic, glycerol abietate and FD&C yellow no.5.>>

That was one of America's favorite cocktails ingredients list, which is promoted to be on the rocks or frozen with *crushed ice, classic lime, strawberry lime, mango, pineapple, and classic limelight!*⁷⁶

Adding to the fact that this is a sugary product (*with corn syrup and sugar listed first*), that item doesn't even contain a central ingredient.

The absence of a real food listed as “the main ingredient” means this is not an actual food item but a new laboratory-made product. No matter how safe these ingredients are, it can be a problem for the human body to cope with such an extract mixture.

RULE #5:

The Long Ingredients List Should Arouse Your Suspicion

Sometimes the number of ingredients can be as informative as the ingredients themselves. A long vs. short list can give an overview of how highly the product is processed. Typically, the longer the ingredients list, the more processed it is.

Why?

Every additional ingredient affects the overall properties of the final product, including color, density, taste, and even smell. In order to adjust these properties to suit the final product condition, almost every new ingredient requires additional processing, ultimately leading to a highly processed final product.⁷⁷

► Takeaway #10

To sum up, there should never be a room in your shopping cart for a product where:

- 1. Any forms of “sugar” or “salt” are listed first on the ingredients list.*
- 2. The main ingredient is not listed among the three first ingredients.*
- 3. The main ingredient is missing (100% human-made product).*
- 4. The ingredients list is so long.*

RULE #6:

Check Out the E-numbers

E-numbers are those numbers that are linked to the letter “E” on food labels such as E300 and E948. You may find these in products made in the EU and Australia.

The E letter refers to the European Union. The total code is assigned to food additives checked and listed under the European Union standards. The numbers might refer to color, flavoring agents, preservatives, sweeteners, gelling agents, or emulsifiers as follows:

E100 – E199 ➔ Colours

E200 – E299 ➔ Preservatives

E300 – E399 ➔ Antioxidants & Acidity Regulators

E400 – E499 ➔ Thickeners, Stabilisers and Emulsifiers

E500 – E599 ➔ Acidity regulators anti-caking agents

E600 – E700 ➔ Flavour Enhancers

E900 – E999 ➔ Miscellaneous

E1000 – E1999 ➔ Additional Chemicals

What to Consider Besides Moderation?

Considering these food additives go through lengthy testing processes before having them unleashed for public consumption, most of these food additives and preservatives listed as E-numbers are supposed to be safe. However, we still want to make sure they are not found in children’s food products and found only in trace amounts in the rest of the items. Other than this, there still exist some E-numbers (food additives) that must be avoided in any amount and in all cases.

The list includes **E102** (Tartrazine)⁷⁸, **E621** (monosodium glutamate)^{79 80}, **E351** (aspartame)⁸¹, **E211** (Sodium benzoate)⁸², **E133** (Brilliant blue FCF)⁸³.

► ***Takeaway #11***

E-numbers make it easier to deal with the wide variety of names for food additives. It is as easy as making sure none of these last unsafe numbers are not included in the ingredients list. Ideally, you don't want to spot an E-number (food additive) among the three first ingredients as this means additives make up the bulk of the product, nor do you want to find an E-number on the ingredient list of a children's food product.

Step 03: Interpret the “Nutrition Facts” Label

RULE #7:

If a Product Contains Any Amount of Trans Fat,
Put It Back on the Shelf

The “nutrition facts” label delivers precise information about the product components in gram/milligram, calories per serving, and Daily Value (DV%).

We aim for a product with about **0g** trans fat **with the lowest amounts of** saturated fats, added sugar, and sodium. Ideally, we want to aim for a fiber-rich food with some amounts of monounsaturated and polyunsaturated fats, omega-3 fatty acids, proteins, and essential vitamins & minerals.

Be Aware:

0g of trans fats and 'trans-fat free' sometimes refer to two different things. According to the FDA labeling standards, « trans fatty acids should be listed as "Trans fat" or "Trans" below the listing of saturated fat on the nutrition label. Trans fat content must be expressed as grams per serving to the nearest 0.5-gram increment below 5 grams. It must be to the nearest gram above 5 grams. If a serving contains less than 0.5 grams, it is expressed as "0 g." »⁸⁴

0.5g per serving is not something to be considered as harm. However, pay attention as the tiny amount rises with every additional serving!

What Is Daily Value (DV%)?

Unlike what this might appear to be representing, the nutrient proportion contained in the product, DV, is an RDA (Recommended Dietary Allowance) term designed to help consumers use food label information to plan for an ordinary diet of 2000 calories per day.

If the label lists DV 5% of potassium, it means that one serving provides 5 percent of the potassium you need each day based on a 2000-calories requirement. In general, 5% DV or less is low, and 20% DV or more is high.

Red, Amber, and Green Color Coding

You might be in front of these traffic light colors that highlight nutrients listed on the “nutrition facts.” These colors are to help the consumer make healthy choices at the supermarket based on DV%.



- ⌚ Red color means high.
- ⌚ Amber color means medium.
- ⌚ Green color means low.

In other words, the greener the label, the healthier the product.

Calorie Information / The Serving Size

The average person needs approximately 2000 calories daily for the different body functions. More can lead to weight gain, and less can lead to a lack of energy. For the 2,000-calories diet:

- ❶ 400 calories or more per serving is considered high.
- ❷ 100 calories per serving is considered moderate.
- ❸ 40 calories per serving is considered low.

Step 05: Master Shopping for Real Foods

RULE #8: Understand Meat and Seafood Products

For being packed with *high-quality protein, iron, zinc, selenium, niacin, vitamin B6 and B12, besides other essential nutrients*, animal meat should represent an ideal nutrient-dense source of energy in the human diet.

We have grown accustomed to eating red meat (*beef, goat, lamb*), poultry (*chicken and turkey*), or *pork* through years of evolution and agricultural practices. Still, with terms labeling different types and grades of meat today such as: “marbling,” “lean,” “extra-lean,” “prime beef,” “choice beef,” ... etc., as well as the rising concern about the saturated fat content in animal meat, now, must be the time to update our old knowledge in the area.

What Is Marbling?

The word marbling refers to the intramuscular fat represented in the white flecks within the lean sections of meat. It adds a tasty flavor to the piece and, thus, it is one of the main criteria for judging the cut quality in culinary art: The more marbling it contains, the better the cut of meat, for the presence of marbling ensures better tenderness, better moistness, as it adds a lot of flavor to the piece. Yet, not from a health-supporting perspective, for the existence of these flecks on the cut of meat has two other indications:

1/ more marbling means more fat (mostly saturated). And 2/ It tells something about the animal's diet and feeding. Since it is almost impossible to develop a significant amount of fats by feeding on grass only, we're in front of an out-of-grass diet (mostly grain-fed animal), which should negatively affect the quality of meat in terms of its healthfulness.

Interpreting the Label

- Eye of round, top round, sirloin, top loin, tenderloin*—for **beef**.
- Leg of lamb, arm, loin*—for **lamb**. And —*tenderloin, top loin, sirloin, loin chop, rib chop*—for **pork**.

These represent the leanest cuts of meat to opt for. But if you find the word “lean” or “extra lean” on the label, be aware that:

« **Lean** means that 100 grams of beef (about 3 1/2 ounces) have less than 10 grams of fat, 4.5 grams or less of saturated fat, and less than 95 milligrams of cholesterol.

Extra Lean means that 100 grams of beef with less than 5 grams of fat, less than 2 grams of saturated fat, and less than 95 milligrams of cholesterol. »⁸⁵

Regarding the USDA grades for beef:

« Beef is evaluated by highly skilled USDA meat graders using a subjective characteristic assessment process and electronic instruments to measure meat characteristics. These characteristics follow the official grade standards developed, maintained, and interpreted by the USDA's Agricultural Marketing Service.

Beef is graded in two ways: quality grades for tenderness, juiciness and flavor; and yield grades for the amount of usable lean meat on the carcass. From a consumer standpoint, what do these quality beef grades mean?

Prime beef is produced from young, well-fed beef cattle. It has abundant marbling (the amount of fat interspersed with lean meat,) and is generally sold in restaurants and hotels. Prime roasts and steaks are excellent for dry-heat cooking such as broiling, roasting or grilling.

Choice beef is high quality, but has less marbling than Prime. Choice roasts and steaks from the loin and rib will be very tender, juicy, and flavorful, and are suited for dry heat cooking. Many of the less tender cuts can also be cooked with dry heat if not overcooked. Such cuts will be most tender if braised, roasted or simmered with a small amount of liquid in a tightly covered pan.

Select beef is very uniform in quality and normally leaner than the higher grades. It is fairly tender, but, because it has less marbling, it may lack some of the juiciness and flavor of the higher grades. Only the tender cuts should be cooked with dry



heat. Other cuts should be marinated before cooking or braised to obtain maximum tenderness and flavor.

Standard and **Commercial** grades of beef are frequently sold as ungraded or as store brand meat. **Utility**, **Cutter**, and **Canner** grades of beef are seldom, if ever, sold at retail but are used instead to make ground beef and processed products. »⁸⁶

What's About Seafood?

By certain measurements, seafood, *like trout, mackerel, herring, sardines, and salmon*, may represent the best meat that provides a good source of high-quality protein and good unsaturated fats in the form of long-chain omega-3 fatty acids.

Fish are more heart-healthy than crustacean sources of seafood and contain less cholesterol than *shrimp, prawns, or lobster*. Wild fish, rather than farmed fish, are high in omega-3 fatty acids, contributing to reduced inflammation and overall cardiovascular health by reducing triglycerides (*the storage form of fat in the body: go back to MACRONUTRIENT #2: FAT / Chapter 01*).

Shellfish also contain omega-3 fats. A 3.5-ounce (100-gram) serving of *oysters* provides over 100% of the RDI for vitamin B12, zinc, and copper and over 75% of your daily needs for selenium and vitamin D. *Clams* are also good sources of vitamin A, calcium, selenium, and potassium.

Despite the rising concern regarding seafood toxication—*potentially caused due to certain chemical-related contamination as a result of industrial pollution that finds its way into lakes, rivers, and oceans*—seafood quality and safety still depend on the water where the fish live, what they eat, how properly the

product is handled and stored, and most importantly, your shopping skills.

Edward R. Blonz, *Ph.D. in nutrition*, has made things clear in this regard: *“It’s important to be sure that the seafood you buy has been handled and stored properly to reduce the risk of foodborne illness. Only buy fresh fish or shellfish that is refrigerated or properly iced. Fresh fish should be displayed in a case on a thick bed of fresh ice. The eyes of the fish should be clear and bulge a little. Whole fish and fillets should have firm, shiny flesh and bright red gills, free of slime. Fish fillets should not be dark or dry around the edges. Don’t buy frozen seafood if the package is open, torn, or crushed on the edge.”⁸⁷*

The latter also pointed out, *“Buy only live oysters, clams or mussels. Do a “tap test” at the store: Live clams, oysters, and mussels close up when the shell is tapped; if they don’t close, don’t buy them. And if they don’t pass the test once you get home, discard them. [Ideally, you buy closed shells, as open shells mean that the shellfish are dead.] Crabs and lobsters spoil rapidly after death, so if buying fresh, choose only those that show some leg movement.”⁸⁷*

What Is Aquaculture?

With the number of the world's farmed seafood expected to increase from 52% to 62% by the next decade, the world's turnout for aquaculture is growing, giving rise to two seemingly different seafood classifications: "wild-caught" vs. "farm-raised" fish.

Concerns have been raised regarding the industrial pollution effect on wild-caught seafood safety, while **aquaculture** upsets more environmentalists.

Farm-raised fish is a lucrative business. However, they are harming the wild fish. Since farm-raised fish are often confined to a small area with a net system that allows small marine life to enter for food, these nets also allow fish lice or fleas to come with it. Wild fish usually swim or brush up against things, not allowing these fleas to adhere to them. The fleas also transmit infections to any fish they can bind to. When wild fish approach, they catch the diseases of the farmed ones.⁸⁸

Wild food, in general, always brings with it dense nutrition. Farm fish are naturally white; yes, farmed salmon is white. The only reason it acquires a light pink color is because of the carotenoids added to their feed, either through natural ingredients like ground-up crustaceans or synthetic forms created in a lab.

► **Takeaway #12**

*When shopping for meat, opt for the eye of round, top round, sirloin, top loin, or tenderloin **for beef**, leg of lamb, arm, loin **for lamb**, and tenderloin, top loin, sirloin, loin chop, rib chop **for pork**—all with the lowest marbling degree.*

When it comes to seafood:

- ✓ *Wild salmon, herring, cod, sole, flounder, pollock, and sardines represent the best seafood to eat more often.*
- ✓ *Seafood to eat less often are trout, bass, halibut, shellfish.*

- ✓ You should avoid large fish like **tuna**, **swordfish**, and **king mackerel** due to heavy metals.

RULE #9:

Understand Eggs and Egg Products

With about 7 grams of protein in a single egg, evenly distributed between the white and yolk, eggs represent an easily accessible and inexpensive source of high-quality protein. Eggs are not high in saturated fat, although some cholesterol is contained within the yolk part of the egg.

The single hen egg also contains vitamins A, C, D, B-6, and certain essential minerals, including iron, cobalamin, calcium, magnesium, and some amounts of potassium and choline.

Different Eggs, Different Qualities

Besides the chicken egg, which is the most common in the market, we have some other types of eggs:

The Goose Egg:

Goose eggs are known for their hard shells. Compared to a chicken egg, these contain three times the protein content (with up to 20 g/egg) and provide a more pungent taste. Yet, the goose eggs are less available since the goose lays no more than 40 eggs each year.

The Duck Egg:

The duck eggs are high in fat, protein, and vitamin B compounds. They have a thicker shell and slightly larger yolk compared to the chicken eggs.

The Quail Eggs:

These have brownish dots on them that are surprisingly rich in important nutrients for their small size. In a 14-calories

serving, a single quail egg is packed with vitamin B12, pantothenic acid, riboflavin, selenium, choline, vitamin A, iron, and folate.⁸⁹

The Turkey Eggs:

Those are not that available, too, as the turkey lays but one egg every four days. It is similar in size to a duck's egg but has a creamier taste. Turkey eggs are rich in calcium, vitamin A, and potassium.

The Ostrich Egg:

This is the largest egg of the largest bird on the planet. An ostrich egg contains 47% protein and 45% fat in a serving of 2000 calories. The ostrich egg is around 1.5 kilograms, and it contains choline, B12, riboflavin, folic acid, magnesium, and iron.⁹⁰

Egg-To-Egg Comparison

The first discernible difference among eggs at the market is the color. Some of the hens lay white eggs, while others lay brown-colored eggs. Yet, it is still a genetic difference and has nothing to do with the egg's quality.⁹¹ Some chickens even lay blue and green eggs in some rare cases without affecting the egg's content.⁹² We also have the "fertile vs. unfertilized eggs" standing debate. Well, the eggs found in the market are mostly unfertilized, but we have no evidence showing any health advantages that may come from eating fertilized eggs over their unfertilized counterparts. All in all, the three most important things to look for in a high-quality egg are the following:

1/ Lutein-Enhanced Egg:

Lutein is a carotenoid naturally occurring in plants and found in green leafy vegetables such as kale and spinach. It is

suggested that lutein has beneficial effects on the progression of age-related macular degeneration.^{93 94}

We get a lutein-enriched egg by increasing the lutein levels in the feed given to the laying hens.⁹⁵

2/ Omega-3-Enriched Egg:

It is the case where the egg should come with a greater content of omega-3 fatty acids.

3/ Certified Organic Egg:

Well, organic eggs hold a special reputation, for they come from hens that have outdoor access and feed on organically grown vegetarian feed, with no added antibiotics, hormones, or pesticides.⁹⁶

RULE #10:

Buy Locally Grown Fruits and Vegetables

The mother tree provides the fruits with certain natural protection and preservation against all the threatening environmental factors, mainly represented in **oxygen**, **temperature**, and **moisture** (or humidity). But once the fruit is reaped and cut from its vital source (e.g., the tree), it becomes vulnerable and totally defenseless against these environmental effects.

Fruits and vegetables contain some natural chemicals known as “oxidizing enzymes.” They are called so because they react with **oxygen** within a chemical process known as “oxidation,” whose effects are reflected in color change and fast produce spoilage. Precisely, the same chemical and physical changes that occur on a piece of apple that has undergone air exposure for some time.

Also, a low-**humidity** environment and air cause the surrounding produce to dry out and moisture content to evaporate, resulting in wilting, meaning the produce is ruined and must be thrown away.

Concerning the thermal effect, the climate doesn't have a direct impact on harvested fruits. However, **temperature** between 5 and 60 degrees celsius provides the best environment that supports the growth of toxic bacteria in food. This range [5°C - 60°C] is known as the “danger zone,” for it provides a preferable condition for harmful bacteria to live and grow, which poses a real threat to human health by poisoning its source of energy (food).

How Are These Unwanted Factors Dealt With in Commercial Farming?

Despite the threatening environmental factors we discussed earlier, the bananas harvested in Ecuador are still available in almost every world supermarket in the best condition. Even though the produce has to travel for long distances, its texture, taste, and other physical properties are optimal.

How is that possible?

« First, the bananas are harvested in an unripe, green state in order to reduce the risk of deterioration during transport. When they are harvested, all bananas are kept dry and in the shade before and after packing.

As soon as the hands of bananas are cut from the stem, they should be laid, curved, side uppermost, across the midribs of fresh banana leaves to prevent latex in the cut crown (*a milky fluid found in many plants that exudes when the plant is cut and coagulates on exposure to the air*) from contaminating the fruit. After the latex flow stops within about 12-15 minutes, the banana may be packed into wooden or, preferably, cardboard boxes, which can be of the slotted or telescopic type.

For 4 or 5 storage days, no special post-harvest treatments are necessary. But Suppose sales are to be delayed for a greater time. In that case, it raises the need for more special treatment, mostly by getting the produce exposed to certain chemicals and substances like to be washed and dipped into some pesticides and fungicides before the packing. »⁹⁷

Results:

Imported products are of less quality compared to their locally grown counterparts for two reasons: 1/ More external, technical, and chemical processes are required, and 2/ Fewer nutrients are provided because the initial nutrient value decreases over time and also due to the fact that they are picked before they are fully ripe.

Thinking socially, your switch to local produce is another individual step toward an environment-friendly community, where reducing food miles would considerably alleviate our reliance on fossil fuels. Furthermore, the local economy would benefit too as the increased demand for local products makes a significant difference in the GDP growth rate. Or, to put it simply, the more we buy locally produced items, the more money will be circulating in the local economy. Everyone wins at the end of this. Shopping locally supports your local economy and keeps your health in check.

► Takeaway #13

Always know how to opt for the best at the supermarket:

- ✓ First, choose **whole** fruits and vegetables over pre-cut produce, for the skin is believed to lock in the flavor and the nutrients of the fruit or the vegetable.

- ✓ *Don't judge fruits or vegetables by their external appearances, but based on how **original** their weight and color are.*
- ✓ *When shopping for corn, look for bright green, tightly wrapped, and relatively moist husks. Go for the corn on the **top** of the pile, as the ones on the bottom are likely to lose taste due to the heat generated by the pile of corn above.*
- ✓ *Concerning lettuce, go for the most deflated and the thinnest sac as lettuce releases gas when it ripens. A puffy sac means the lettuce has been on the shelf for a long time and will likely go bad soon. Other than that, any type of head lettuce with **dark green** outer leaves intact is good.*

When it comes to fruits, melon seems to be the most challenging part of the shopping:

- ✓ *Try to 'tap' the melon and look for a deep hollow **sound** back, which means it is ripe.*
- ✓ *Other than the hollow sound, the perfect melon should feel **heavy** in hand for its size; and the splotch where the melon sits should be of creamy yellow color.*

Last but not least, don't delay the proper storage of your food products after shopping, and make sure to store fruits and vegetables separately, for fruits produce a gas that can cause quick spoilage to the nearby vegetables.

CHAPTER

4

How to Go About *Your Daily Eating Habits*

Two to three servings of avocado toast with hard-boiled eggs should sound like a perfectly safe post-workout refueling snack. Still, taking a shower right after it may interrupt its digestion, resulting in poor nutrient absorption as well as other consequent disorders. The reason is that the body's exposure to hot water in the shower stimulates the blood to rush into every inch of the body at the time when the flow should be concentrated around the stomach area to help with the ongoing digestion process.

That was one example of how your mindless behavior can turn a healthy meal that should support your best possible physical, mental, and emotional wellbeing into a real health threat. Such a reason must, therefore, raise the need to shed light on some other topics related to the way we behave around food—topics like *mindless vs. mindful eating, eating pace and eating posture, the number, size, and even the right time of your*

meals, considering the effect of before- and after-meal-time activities on the digestion process as well.

Eventually, the careful consideration of all these factors, combined with the best suitable diet as determined in Chapters 01, 02, and 03, would complete your guide toward constituting your highly healthy eating pattern in the general term or having your diet matched to some particular medical or personal needs of yours whenever and however required.

EATING HABIT #1: EMOTIONAL EATING

Positive as well as negative emotions are a very normal part of who we are as humans, and they usually don't affect our health more than the way we react when they hit might do. At the peak of strong emotion, some know to channel that excess of positive or negative energy into exercise. In contrast, others turn to food for comfort as a part of a common practice known as "emotional eating." While the first reaction helps you torch calories, tone your body, and healthily regain emotional balance, the so-called "emotional eating" forms an **unhealthy cycle** between a particular emotion and an uncontrollable craving for some soothing and pleasant foods in the long run.

Why "An Unhealthy Cycle"?

Guided by our body's natural hunger and fullness signals, we mainly eat food to cover our needs for energy. Eating for emotional reasons or any reason other than hunger may shut down those guiding signals in the process and potentially cause you to eat more than what you actually need.

In another aspect, negative emotions usually create a feeling of emptiness. That feeling may go on its own over a period of time, or it can be eased through certain health-friendly practices like exercising or meditating. Deceived by a false feeling of "fullness" or temporary relief, an emotional eater turns, however, to certain foods as a way to fill the emotional void. Unfortunately, emotional eating cannot fix emotional

problems. In fact, it may even make one feel worse as it may arouse the feeling of guilt for overeating eventually.

Therefore, emotional eating not only interferes with making healthy choices and sabotages your efforts in maintaining a healthy Basal Metabolic Rate, but it may also handicap your emotional recovery in the short and long term.

How to Prevent the Development of the Unhealthy Cycle?

If a strong link of addiction is already formed between the particular emotion and food triggers, no direct approach can help you break free from the cycle of habit unless through some carefully followed processes that will be uncovered in Chapter 07. But if the cycle of emotional eating is any less intensive for the time being, you may still find better ways to feed your feelings.

First, don't try to act swiftly when the emotion is at its peak. Sit back and give yourself time to understand how you are actually feeling before taking the right action accordingly. If it were just a feeling of exhaustion or tiredness, taking a short nap in a quiet place should make you feel better. But if it keeps coming, you may want to check on your sleeping times in accordance with the information shared by Dr. Bahareh Moshtagh in Chapter 05.

Again, if you feel lonely and depressed, there may be some people in your life who can fill that gap. Just give them a call and see if you can spend a moment together. In case they were busy with something else that day, offer to help them with it if possible. After all, the satisfaction you get from helping others makes you feel good about yourself, and it is one of the best ways

to help you break up with loneliness and get over the moment of depression.

Finally, if you're anxious, HelpGuide.org recommends expanding your nervous energy by dancing to a favorite song,⁹⁸ squeezing a stress ball, or just taking a brisk walk.

EATING HABIT #2: EATING UNTIL YOU ARE 100% FULL

That J-shaped organ in the upper part of the abdomen, which we call the stomach, serves as a vital fuel tank for animals and humans. After each meal, the food you eat remains in your stomach for about 2 to 4 hours before it passes to the small intestine. This means the stomach is the first digestive organ to get affected by the quality as well as the size of your meals.

The stomach is about the size of two adult's hands placed on top of each other. And for the time it holds food within its resilient walls, it needs room for water and enough space for the expansion of gases. When eating a lot of food until you get full, you cause the stomach to stretch out in order to make room for gases and water. The more you load your stomach to its full capacity, the more it expands to sustain even more food until a health-threatening cycle forms, where you can eat more and more and gain more and more weight.

Other Potential Health Impacts

Besides its harmful effects on the stomach, eating until you are stuffed applies tremendous pressure to the whole digestive tract and increases the risk of experiencing indigestion disorders such as stomachache, diarrhea, and constipation. Even if that food bypasses the advanced stages of the digestion process successfully, it might later put the body at a high risk of developing obesity and its consequent disorders, potentially, in two other ways:

First, the large amount of calories served in a single meal will be stored in the body as added fats if the amount of energy exceeds the body's need as a result of overeating.

Also, the body might not make enough digestive chemicals to digest large portions of food elements. Scientists studying the body's feeling of fullness (satiety) have identified two main digestive enzymes, 'pepsin' and 'trypsin,' that contribute to the digestion process. If that amount of food waiting to be digested outweighs these chemicals, some of the food may be left undigested and is instead stored to form a pile of fatty masses. In another light, excess food intake may interfere with maintaining a healthy hormonal balance when it triggers the body to keep (abnormally) producing more chemicals and hormones.

How Much to Eat In a Single Meal?

Although it is now proven medically and scientifically, many ancient civilizations did not like the habit of eating until fullness. Shared by Michael Pollan in his book "The Food Rules": « The Japanese have said: "hara hachi bu", counseling people to stop eating when they are 80 percent full. The Ayurvedic tradition in India advises eating until you are 75 percent full. The Chinese specify 70 percent and the prophet Muhammad described a full belly as one that contained 1/3 food, 1/3 liquid, and 1/3 air. »⁹⁹

EATING HABIT #3: EATING TOO FAST

You always want to rely on your natural body's signals to know when to eat and when to stop accordingly. By following the real hunger cues, you eliminate any reason that may potentially lead to mindless eating. But knowing when to stop could be trickier to determine as it differs based on what you eat and how long it takes you to do so.

Different “Satiety Indexes”

You need fewer calories from baked potatoes to make you feel full than from ice cream because each food affects the body's feeling of fullness differently. Quantity, type of food, and how fast you eat determine when you receive the fullness alert.

The high-density energy of foods such as ice cream, chocolate, and cookies, which makes them tasty, delays the “fullness” signal delivery. On the other hand, vegetables, fruits, nonfat milk, cooked grains, soups, stews, and lean protein stimulate fullness feeling faster and with fewer calories.

Slow Down and Listen to the Signals

Hormonal signals are released as partially digested food enters the small intestine (*estimated at 20 minutes after the start of the meal*).¹⁰⁰ If we don't eat slowly enough, the sensation of satiety will arrive too late to be of any use. It could be quite challenging for many people to spend more than 20 minutes on a meal in today's fast-paced world. Still, you want to embrace that good

habit for the sake of your own health as it ensures better digestion, better hydration, easier weight maintenance, and greater satisfaction with the meal. Otherwise, eating in a hurry leads to poor digestion, increased weight gain, and lower satisfaction, as it may end with hormonal imbalance.

EATING HABIT #4: DISTRACTED EATING

“Distracted dining may be as dangerous for your health as distracted driving for your safety on the highway,” a new study at the University of Illinois concluded.¹⁰¹

One of the research participants was Barbara H. Fiese, Director of the U of I’s Family Resiliency Center (FRC), who said for the first time she looked at the topic from a family gathering perspective.

According to Fiese, *“If you’re getting up and down because you’re distracted during a meal, you’re probably not able to pay attention to the kids’ emotions or to model good responses to your hunger cues—noticing when you’re full and not continuing to eat.”*¹⁰¹

“This study shows that it’s not enough to encourage families to eat together regularly without identifying other factors that promote health. Distractions and disruptions may be part of a family environment that is habitually chaotic and unstructured. We know that children raised in chaotic family environments are at increased risk for becoming overweight or obese,” she clarified.

In addition to Fiese’s concern, take into consideration that the human brain is not a multifunctional machine when it comes to directed actions. The brain can’t effectively handle more than two directed mental activities at once. The starting stage of the digestion process in the mouth is a directed mental activity in the first place. If the brain gets distracted by a TV show or anything other than the meal, the teeth performance for cutting and breaking down the food pieces will be badly affected, and so will the rest of the digestion process.

EATING HABIT #5: EATING IN THE WRONG POSITION

People eat their food in different positions. Sitting, standing up, and lying down are the three known eating postures that affect the digestion process differently. When you are standing, food empties from the stomach more slowly than when you eat while sitting or lying down. The exact reasons why are not completely understood, but gravity seems to play a part.

Regardless of the cause, faster digestion may give rise to some indigestion issues as the short contact of the partially digested food with the gut wall makes it more difficult to be fully absorbed in the body.

According to that fact, standing up is not the posture you want to adopt while and shortly after eating, for it is associated with faster food evacuation. Also, eating on the go does not give you the chance to lie down for a moment after having a large meal, which should significantly slow food emptying compared to all other positions.¹⁰²

EATING HABIT #6: TAKING TEA CLOSE TO MEALTIMES

After water, tea ranked the second most-consumed drink worldwide. It is an aromatic beverage prepared from the cured leaves of the *Camellia sinensis*, an evergreen Asian shrub. Exceptionally, tea safety depends on the time of its consumption more than any other factor. Taking any amount of tea after or just before consuming foods that are high in **iron** and **protein** results in stomach acidity and causes an imbalance in the digestion process.

Green tea contains some forms of tannins, such as flavonoids and catechins. Studies show that the high concentration of these tea components interferes with protein and iron absorption.¹⁰³ Furthermore, tea contains a phenolic compound which, *together with iron that comes from the food you have just eaten or you are about to consume*, can inhibit iron absorption, potentially resulting in various stomach issues.¹⁰⁴

EATING HABIT #7: PERFORMING HEAVY ACTIVITIES AFTER A LARGE MEAL

Working out or performing intense physical activities like swimming, cycling, or running instantly after eating may end with harmful health effects and fewer benefits from the exercise.

First, Because of Poor Digestion

While digestion is in process, significant amounts of oxygenated blood are required around the stomach to help with the operation. When exercising right after the meal, the blood flows increasingly to the other parts of the body that are active at the moment of the exercise. The consequent outcome is poor digestion and malabsorption of essential nutrients.

Fewer Benefits From the Exercise

For about the same reason, trying to work out on a full stomach puts the system under tremendous pressure. In the quest of providing adequate blood flow in more than one body area, the involved systems and organs drain your energy, leading to a severe feeling of weakness and lethargy—the result: bad performance during workout with a poor muscular response.

Other Harmful Effects

Besides interfering with proper digestion and excellent workout results, exercising right after a large meal raises stomach upset

and heartburn risks due to gastric reflux caused by the stomach's unstable acid movement during exercise. (*To be explained further in Chap. 6*)

A Shower After the Meal Is No Less Hazardous

Water exposure or particularly alternating hot and cold water in the shower is one of the best natural health-enhancing options to keep the health of your nervous system in check (*to be further explained in Chap. 5*). Still, the body's exposure to hot water in the shower jump-starts blood circulation. It causes blood to rush to the skin and flows to reach into every inch of the body at the time we need it to flow increasingly around the stomach after the meal. Consequently, it imposes about the same health threats as an after-meal heavy exercise would do—that is, poor digestion, incomplete nutrient absorption, and an increased risk of heartburn and stomach upset.

► Takeaway #14

First, make sure no link is formed between food and any of your emotions. If you find it hard to tell, it's enough to make sure you are not eating for reasons other than hunger.

As you sit for the meal, leave some space for liquid and air in the stomach. This could be trickier too, but eating at a slow pace, away from all

distractions, would help you spot the signals on time to act accordingly.

Taking a rest for a short moment after a large meal ensures good digestion, while taking a shower or performing heavy activities is never recommended. In that concern, for the best performance with the least problematic outcomes and the most benefits, professional athletes are usually recommended to have their last meal 180 minutes before the game (or the training session).¹⁰⁵

Finally, you always want to avoid tea around mealtimes as it may interfere with protein and iron absorption. As a substitute, use mint leaves boiled in water to wash down your stomach after each meal whenever you have to.

PART I ENDS

Catch the midline #1: Between the Pursuit of Healthy Eating and the Disease of “Orthorexia Nervosa”

Good nutrition plays a fundamental role in everyone’s health, yet too much of anything is always bad, and healthy eating is no exception. When eating healthy becomes an overwhelming obsession, it puts one at the risk of a severe health-threatening disorder known as “Orthorexia Nervosa.”

As explained by Dr. Steven Bratman (the first to coin the term Orthorexia Nervosa in 1996): *“Orthorexia is an emotionally disturbed, self-punishing relationship with food that involves a progressively shrinking universe of foods deemed acceptable. A gradual constriction of many other dimensions of life occurs so that thinking about healthy food can become the central theme of almost every moment of the day, the sword and shield against every kind of anxiety, and the primary source of self-esteem, value and meaning. This may result in social isolation, psychological disturbance and even, possibly, physical harm.”¹⁰⁶*

There is a fine line between trying to eat healthily and being obsessed with healthy food. And if the last explanation did not make the two perspectives any more distinguishable, pay attention to the nuances in the following dreadful experience of a 30-year-old man shared by his own mother to help you set a

middle ground between the target healthy eating and the detrimental case of Orthorexia Nervosa:

"My 30 y.o. son was muscular, trim and fit being 6 feet tall and 200 lbs. He always ate a healthy, balanced diet until about a year ago when he gradually became obsessed with food purity. His diet became more and more restrictive. He couldn't eat at restaurants or at other people's houses. If invited somewhere, he brought his own food. Only organic foods, specific combination regimens, not this, not that, etc... He spent hours everyday shopping, chopping, preparing, making mega messes in the kitchen and thinking about food. That's all he talked about. He lost most of his friends over this compulsive, purist behavior and he gradually became more and more isolated.

He didn't feel depressed and thought he was doing very well. He was proud of his will-power to maintain this extremely stringent regimen. He made remonstrances to us. Even when we were health conscious, it was never enough. If, for some reason, he felt like he had strayed from his diet, he compensated the next day by NOT eating, to detox!

At times, he was very hungry and succumbed to binge eating (all organic and healthy). He felt he was losing control and became terrified of eating too much. He lost the sense of eating when hungry. He couldn't keep up with all the time spent in the kitchen making his own sauerkraut, fermented veggies, spouted grains and beans, kefir, etc... It became easier to not eat and he started skipping more and more meals, especially at work. He got to the point where he wasn't hungry anymore.

He rapidly lost weight. He lost all his muscles and became severely emaciated. Literally just skin and bones, he looked like a Holocaust survivor, all the while believing he was doing great and was healthy. He didn't see himself as too thin. He had

trouble moving, walking, lifting his arms. He fell asleep at the wheel several times. He went down to 109 lbs. His speech slowed as well as his mental functioning. His hands turned blue. His nails got deformed. His legs swelled. He was dying.

A few weeks ago, we finally found an eating disorder specialist who mentioned the name ‘orthorexia.’ It was very hopeful to finally see that he is not the only one experiencing this disorder. There is even a name for it (now) which is somehow reassuring because it means that someone recognizes that this condition exists and there might be a way out of it.

My son is now working at recovering from it. He’s too weak to work. It is very difficult to break his obsessions and convince him to eat a wider variety of food. I hope he has not suffered permanent damage to his organs, particularly his heart. He so wanted to be healthy. This disease kills.

In our family, we believe in eating healthy and we do well with it. For him, it got out of hands. He got trapped in an obsession with food purity and almost died. Yes, it is ironic and weird. But it’s real.¹⁰⁷

PART II

THE SIMPLE SCIENCE OF MAINTAINING AND IMPROVING YOUR BODY STATUS

Many definitions have been assigned to the term “healthy” over the years. Despite the wide variation in the chosen words and the defined standards from one phrase to a second, they all seem to intersect around two determining bases:

1/ The body's functional proficiency; or how efficient and effective the body systems are in performing their respective functions, and

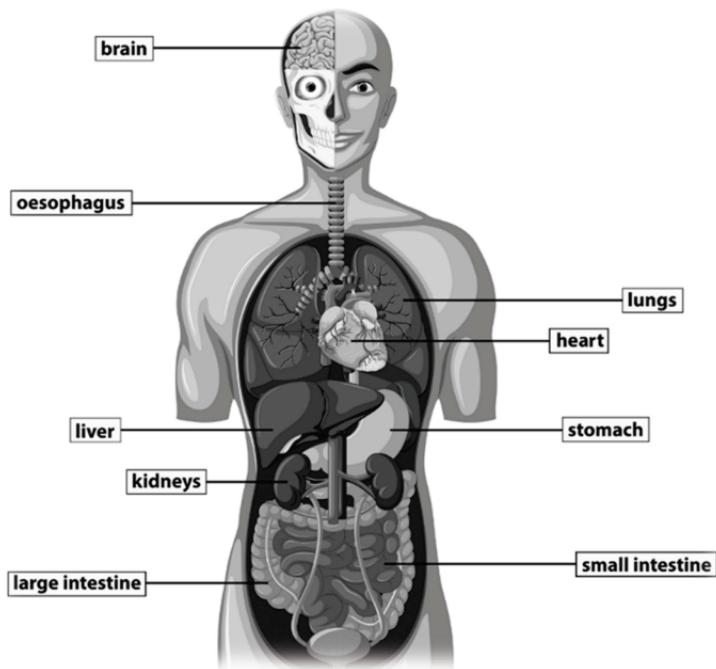
2/ physical wellness; or the absence of illnesses, diseases, and infirmities that may affect the particular system during the lifetime.

Through the content of its two involving chapters, Part II ensures your best control over your body, as it aims to help you gain, maintain, or even regain the healthy state of the body under those two stipulatory bases.

PREREQUISITE #3

The Main Internal Body Organs and Their Functions

- The human brain is a three-pound organ that consumes about 20% of the body's energy to supervise and control most of its functions and keep it in contact with the surrounding environment by interpreting information from the outside world through the five senses.
- The heart is a fist-sized muscle organ that pumps oxygenated blood to every cell in the body through the blood. The two lungs carry out the gas exchange process, where they pump out carbon dioxide and take in fresh oxygen from the surrounding environment.
- The esophagus allows food to pass from the mouth to the stomach and keeps it from coming back up.
- The stomach mixes and breaks food down into very small particles and then pushes the mixture into the small intestine.
- In the small intestine, food materials are further digested and broken down to be absorbed through the walls of the digestive tract and delivered to the rest of the body.
- The waste products move into the large intestine to be ejected from the anus.
- The two kidneys filter the blood before sending it back to the heart and eventually get rid of the waste in the form of urine through the 'urethra'.



CHAPTER

5

How to Take the Best Care *of the 5 Major Body Systems*

Following the isolation of nutrients in capsule form, dietary supplements were part of a dietary strategy to treat and cure beriberi (with vitamin B1), pellagra (with vitamin B3), scurvy (with vitamin C), pernicious anemia (with vitamin B12), and rickets (with vitamin D).¹⁰⁸ Yet, soon after their introduction, these laboratory-made products took the market by storm. They were marketed as an effective solution in enhancing nutritional status and preventing illnesses resulting from their deficiency. Today, they are readily available on the counters of most major grocery stores and pharmacies.

Nutraceuticals refer to a combination product of herbs and other nutrients in supplement form. Many individuals usually try to diagnose and treat themselves using nutraceuticals as a 'natural alternative' without consulting a healthcare practitioner, or they may turn to a medical doctor for consultation. Many doctors are untrained in neutraceuticals and herbal medicine unless you speak to a naturopathic doctor—a

doctor highly trained in using these natural alternatives to optimize health, prevent diseases, heal chronic ailments and prevent drug-herb interactions.

There is a big difference between therapeutically dosed ingredients on a supplement label compared to any other dose, even if the ingredients are the same. This higher, therapeutically dosed supplement formula may be more pricy than something similar you may find at a grocery store, but this can make all the difference. If you don't take a medication at the right dose, it won't work, neither will an incorrectly dosed herbal formula. Many of these high-quality, highly effective supplements that are research-backed are only available through healthcare practitioners. Many ingredients used in making nutraceuticals and some herbs contain fillers, toxic chemicals, or have heavy metal content from the soil used to grow the plants. There are ways to determine whether a nutraceutical company practices safe standards, but it can be quite taxing. Best to leave it to the experts!

Note that just because a supplement is FDA approved doesn't mean it is safe to consume: According to Harvard Medical School, *ephedra-containing products, which are now banned in the USA, were once readily available and touted safe for use for almost a decade. During those years, the FDA received 16,000 reports of injuries, 62,000 consumer complaints, and at least 155 deaths related to ephedra-containing products!*¹⁰⁹

That was one excellent example of a potent herb in the wrong hands. Throughout the last few years, a huge number of such products have been banned by the FDA, until the FDA finally made the limits of their authority clear to the public by stating that they « cannot test all products on the market containing potentially harmful hidden ingredients. »¹¹⁰

Enforcement actions and consumer advisories for tainted products only cover a small fraction of the tainted over-the-counter products on the market.

For the material I will cover, I will steer clear of the use of supplements or nutraceuticals to prevent or treat illnesses. Firstly, because this is such a rich and broad topic that may require a book all on its own, and second, because I find diet and lifestyle habits to be much more effective in preventing and treating the root causes of many illnesses. In medicine, it is always best to start from the least invasive form of intervention. So we will discuss the implications of diet, lifestyle, and herbal medicine on health and well-being and in the treatment of common ailments as they pertain to major **body systems**.

The Cardiorespiratory System

The **cardiorespiratory system** is a combination of the **circulatory** and **respiratory systems**.

Heart, blood, and blood vessels; all together form the network of the **circulatory system**. This network transports oxygen, hormones, and other nutrients throughout the body and removes waste products like carbon dioxide from our cells.

Blood continuously cycles through the arteries, veins, and capillaries. While arteries carry blood from the heart to different parts of the body, capillaries (small vessels) allow for exchange at the cellular level, and veins transmit blood back to the heart, completing the circuit.¹¹¹

An adult at rest has a heart rate ranging from 60 to 80 beats per minute. Every time the heart beats, it pumps blood carrying oxygen, nutrients, and hormones to every cell in the body.

In turn, the lungs—*which represent the main organs in the respiratory system*—carry out the oxygen /carbon dioxide exchange: They release carbon dioxide and take in fresh air from the surrounding environment containing oxygen and other gases.

The health of the lungs depends on their elasticity, which supports their potential capacity to fully inhale and exhale air, as well as access to clean air, and the availability of nutrients. The health of the heart depends on the condition of the vessels and organs to which it is pumping out, adequate delivery of nutrients

and oxygen to its muscular walls, appropriate electrical activity as well as the size and strength of its muscular chambers.

The Importance of Adequate Circulation

The health of the circulatory vessels has a large impact on the efficiency and adequate perfusion of nutrients and oxygen to all cells of the body. As cardiologist Stephen T. Sinatra explains: “*Good blood flow means your tissues are better nourished so wounds heal faster, nerves are healthier, muscles are stronger, and your overall energy level is higher.*”¹¹²

The walls of the vessels are the areas of the circulatory system that are most vulnerable and are a deciphering factor for circulatory health. *A cold climate, habitual smoking of any kind, stress, lack of a regular exercise routine, an unhealthy diet, and environmental toxins we breathe, consume or absorb through our skin* all have an impact on our vascular integrity. Cholesterol that builds up under the innermost layer of the vessel wall is a much smaller part of the problem than the aforementioned insults, which directly reduce the elasticity of the vessels, causing them to stiffen. Much like the lungs, the ability of our vessels to accommodate for increased volume and pressure demonstrates the best outcomes for our cardiovascular health. Small end-organ capillary beds supplying blood to your kidneys, heart, eyes, and very distant appendages like your fingers, toes, and even your penis or clitoris are usually the first areas to sustain damage due to their delicate nature.

The healthier the vessels, the more flexible they will be and the better they can accommodate the varying pressure changes and demands of the cardiovascular system. Note that damaged vessels result from either *oxidative stress, smoking, eating*

inflammatory foods and foods high in saturated and trans fats, or lack of exercise. It is no wonder we should focus our attention on lifestyle factors to prevent illness before it is too late, as often, certain levels of damage are no longer reversible.

Exercise and the Cardiorespiratory System

Often times I speak to my patients about movement rather than exercise, as the word exercise can be very triggering for some. Many think of exercise as being about weight loss or a way to achieve vanity. Movement is kinder to our minds, and we can begin to think of ways to incorporate more movement throughout the day. This also fosters a healthy relationship with exercising on a daily basis, which ultimately becomes a lifestyle change.

We have to be deliberate in the way we incorporate regular movement in our day-to-day activities. Many people love to hike or play a game outside with friends or family. All these are great ways to incorporate more movement into our lives. Looking at children play and remembering how you played is an excellent reminder of just how much we are meant to move.

If I were to tell you, there is a FREE pill with NO side effects that improves your health on every single level, would you take it? Who wouldn't? What if I told you that free pill was daily exercise. If only exercising was as easy as taking a pill.

Exercise and movement are multiorgan processes. You are strengthening the muscles of the heart, improving your lung capacity, changing the efficiency of your red blood cells to deliver oxygen to cells, tissues, and muscles. You are oxygenating the brain and strengthening the neuromuscular connection between the nervous system and the skeletal muscles. Exercise

enlarges the hippocampus—the part of the brain involved in verbal memory and learning.¹¹³ You even improve your intestines' motility and balance your stress hormones; even your ability to regulate your blood sugar on a daily basis improves. Exercise is hands down the best medicine we have for reversing chronic diseases.

As a beginner, some believe that even about 90 minutes of regular aerobic exercise per week ranging from RPE level 3 to RPE level 6 makes a difference in our overall cardiovascular health.¹¹⁴ That's just 13 minutes a day!

The Rate of Perceived Exertion (RPE) is a virtual measurement unit to help the trainer track intensity on a scale of 1 to 10.

- ⌚ RPE 1: Very light
- ⌚ RPE 2: Light
- ⌚ RPE 3: Moderate (*you should have harder breathing than at rest*)
- ⌚ RPE 4: Somewhat heavy (*you can still take a conversation effortlessly*)
- ⌚ RPE 5-6: Heavy (*getting uncomfortable*)
- ⌚ RPE 7-8-9: Very heavy (at this level, you should be a little breathless, and talking should get more difficult.)
- ⌚ RPE 10: Extraordinary peak effort

Here is a simple 3-day weekly training program suggested by certified trainer Paige Waehner. The exercise ranges from RPE level 3 and RPE level 6 as follows:

«

1. Start with 5 minutes warm-up at RPE 3-4 so the body gets into gear to perform at a higher level of effort.

2. For the next 5 minutes, increase speed, incline, or resistance from the warm-up pace so that you're working at a moderate level. This is your baseline pace.
3. Increase speed, incline, or resistance 1 to 3 increments for another 5 minutes.
4. Now, take 5 minutes to decrease back to baseline, reducing speed, incline, or resistance accordingly.
5. Again, increase speed, incline, or resistance 1 to 3 increments.
6. Then, decrease back to baseline, reducing speed, incline, or resistance until you are back at RPE 5.
7. Finally, it's important to cool down for the rest 5 minutes by decreasing the level down to RPE 3-4 before you stop things off.

»¹¹⁴

► **Takeaway #15**

Never go a month without exercising at least 30 minutes, three days a week. Exercise works like compounded interest. You can't take long breaks from it and expect short-term effort to result in long-term gain. In obese individuals or people with actively inflamed joints, biking, swimming, and other low-impact workouts are great alternatives that will also help with weight loss while reducing pressure on joints.

Herbs for the Cardiorespiratory System

Approximately half the population of North Americans suffer from hypertension. Often times hypertension can be transient and comes from stress or anxiety. Depending on the cause of hypertension, different herbs may be used at different doses for optimal results. Some of these herbs must be used with supervision, and interactions must always be accounted for if the individual is on any medication. Again I highly recommend working with a licensed practitioner to achieve the desired outcome safely. *Herbs, vegetables, and other nutrients that have antihypertensive, hypolipidemic, anti-atherosclerotic, anti-thrombotic properties as well are ones that are venous tonics* are listed below:

	AH	HL	A A	V T	A T	Refere nces
Garlic	✓	✓	✓	✓	✓	115 116 117
Onion			✓			118
Beetroot	✓			✓		119 120
Nuts		✓				121 122
Omega-3 Fats		✓			✓	123 124
Proanthocyanidiins						125
Olive Leaf	✓			✓		126
Olive Oil		✓	✓		✓	127
Indian Coleus	✓			✓	✓	
Hawthorn	✓			✓		128 129
Hibiscus Flower	✓					130

Rauwolfia Serpentina	√					131
Horse Chestnut				√		132 133 134
White/ Yellow Sweetclover				√	√	135
Chinese Motherwort					√	136
Ajwain (Carom seeds)	√	√				137

AH: Antihypertensive; **HL:** Hypolipidemic; **AA:** Anti-atherosclerotic;
VT: Venous Tonic; **AT:** Anti-thrombotic

Foods for the Cardiorespiratory System

1/ Garlic

Garlic provides cardio-protective effects by inducing vasorelaxation, resulting in dilation of vessels and subsequently aiding in blood pressure reduction. Garlic has almost demonstrated anticoagulant properties.¹³⁸ Some cardiologists believe it may even be as effective as anti-hypertensive medications, stating that: “*Garlic has been one of my go-to solutions for lowering blood pressure improving circulation for almost as long as I've been a doctor. I used to tell my patients to eat as much of it as they (or their spouses) could stand!*” says cardiologist Dr. Stephen T. Sinatra, MD.¹³⁹

Allicin, the key component in fresh garlic, also helps reduce inflammation and kill bad bacteria in the gut. Interestingly, garlic and onions can kill bacteria in the air in their fresh form, a property antibiotics do not possess.

Principle Actions of Garlic	Major Indications of Garlic
<ul style="list-style-type: none"> • Anti-atherosclerotic ¹⁴⁰ • Antioxidant • Antimicrobial ¹⁴¹ • Antineoplastic ^{142, 143} • Cardioprotective • Inflammation modulating ¹⁴⁴ • Vasodilation and relaxation ¹⁴⁵ which helps arteries dilate, having beneficial outcomes on blood pressure 	<ul style="list-style-type: none"> • Arteriosclerosis ¹⁴⁶ • Dyslipidemia • Hypertension, mild ^{147 148} • Intermittent claudication ¹⁴⁹ • Fish oil adjunct (to prevent elevations of LDL cholesterol levels) • Colorectal cancer prevention ¹⁵⁰ • Stomach cancer prevention ¹⁵¹ • Common cold, prevention and treatment ¹⁵² • Helicobacter pylori infection, as an adjunct to other treatment • Otitis media, topically ¹⁵³ ₁₅₄ • Tinea pedis, tinea unguium • Thrush

2/ Beetroot

Besides all the other nitrate-rich veggies, including *lettuce, carrots, green beans, spinach, parsley, cabbage, radishes, celery, and collard greens*, **beets** represent an ideal heart-healthy food. Nitric oxide found in beets can dilate blood vessels, helping

lower blood pressure. According to one current study, one cup of beetroot juice (250 mL) daily taken continuously for four weeks can reduce blood pressure.¹⁵⁵ It is suggested that beetroot juice should be consumed 90 minutes before vigorous activity for the best performance-enhancing results.¹⁵⁶ Beets are also rich in antioxidants, vitamins (**A, C, K, and folate**), and minerals like **potassium, copper, and manganese**.

3/ Nuts

Nuts are a source of saturated fats and contain two forms of unsaturated fats: monounsaturated and polyunsaturated fats, which are both healthy types of fats (as explained in Chapter 01). **Omega-3 fatty acids**, a type of polyunsaturated fats, **plant sterols**, in addition to **vitamin E**, help reduce inflammation in the vascular system and antiplatelet properties.¹⁵⁷ Best of all, nuts owe their health benefits to the two main constituents they contain: an amino acid known as **L-arginine** and **magnesium**. Magnesium dilates the vessels by acting on smooth muscle. L-arginine has also been shown to dilate blood vessels and reduce systemic blood pressure inducing the production of **endothelium-derived nitric oxide (EDNO)**.¹⁵⁸

4/ Orange

One navel orange has about 50 mg of **vitamin C**. The daily recommended intake for vitamin C is 65-90 mg a day, so it is very easy to obtain optimal amounts of this nutrient from a well-balanced diet. You do not need to take Vitamin C supplements if you eat an array of colorful fruits and vegetables.

Citrus fruits also contain bioflavonoids that help augment vitamin C absorption, modulate the immune system, and support blood circulation. Vitamin C has countless roles and benefits in the body. But most importantly, vitamin C is

essential for building collagen, which provides elasticity to vessels helping them dilate more readily.¹⁵⁹

5/ Carrot

Carrots and other *yellow-orange fruits and vegetables* contain **beta-carotene** that is converted into **Vitamin A** in the body. Beta-carotene has antioxidant properties and is associated with decreased risk of childhood asthma.¹⁶⁰ In one study, results strongly suggested that β -carotene protects against the decline in Forced Expiratory Volume over one second (FEV1) over an eight-year period in the general population and that β -carotene and vitamin E are protective in heavy smokers.¹⁶¹

6/ Dark Grapes and Blueberries

The skin of blackberries and blueberries is rich in **resveratrol** and **proanthocyanidins**. *Red wine* is also an excellent source for these, but it should be consumed low to moderately. Both resveratrol and proanthocyanidins play a role in reducing the risk of morbidity and mortality secondary to cardiovascular diseases such as atherosclerosis and ischemic heart disease. I highly recommend **wild blueberries** over regular or even organic *blueberries* as they are very rich in dark purple pigment and proanthocyanidins and are naturally even less sweet.¹⁶²

7/ Omega-3 Fats

Omega-3 fats found in *cod, salmon, mackerel, and other cold-water fish* are the healthiest fats for the heart and circulatory system. These fatty acids help reduce inflammation and possess anti-platelet properties, resulting in a healthy stream of blood flow through the vessels.^{163, 164}

► ***Takeaway #16***

*A number of foods aid in the health of our cardiorespiratory system. **Garlic, beetroot, nuts, fatty fish, yellow-orange fruits, and dark purple or blue fruits and vegetables** should be a part of your weekly diet on a regular basis. A general rule of thumb is richly pigmented foods.*

The Immune System

« Over 95% of the world's population has health problems, with over a third having more than five ailments, » according to ScienceDaily.¹⁶⁵ We have a long way to go to increase the number of healthy individuals. Many will depend on medication to get them through bouts of allergies, to commence an infection with antibiotics, etc. The reason for this is twofold. We have slowly created more potent and more resistant bugs via the overutilization of antibiotics. Many bacteria are currently antibiotic-resistant, and the future looks even more grim with the use of indecent hands and other forms of sanitization.

The other piece is that most people are not healthy enough to fend off common mild infections, and often the fear of “watching and waiting” is enough to prevent someone from trying something natural. Still, we can't blame patients for this, as oftentimes, patients are not the best at tracking symptoms and knowing when to seek appropriate care.

An overactive immune system, which may occur as a result of chronic exposure to allergens, a poor diet, or bad luck with the genetic lottery, also results in allergies and food sensitivities. We must remove the burdens on our health before we even introduce healthy diet and lifestyle behaviors. An organic diet will not get you any closer to health if your home is filled with toxins and fumes from new furniture, a new mattress, new paint, new carpets, mold, or the use of chemical-ridden household cleaning supplies.

About Infectious Diseases

When the immune system is triggered more and more often to whatever it has picked up as foreign, it remembers that well. Our immune system constantly builds memory upon sampling our environment. Therefore, a virus must constantly evolve to become slightly different every time to continue to reinfect us, like in the case of the common cold, the flu, and COVID's many shapes and forms. If we don't focus on immune and metabolic resiliency by improving our diet and lifestyle, we will always be vulnerable to all threats that put our existence at stake.

An **infection** could be defined as the invasion and multiplication of non-self-microorganisms that do not belong to the self (the body). The infection may remain localized or spread through the blood or lymphatic vessels to other parts of the body. There exist four main types of infections that cause diseases:

Infection type	Diseases	Conventional Treatment
Viral	Common cold, flu, bronchitis, viral pneumonia, chickenpox, shingles, herpes simplex virus (HSV), HIV/AIDS, EBV, Coronaviruses...	Antivirals
Bacterial	Whooping cough, strep throat, ear infections, and	Antibiotics

	Urinary Tract Infections...	
Parasitic	Amoebic dysentery, babesiosis, chagas disease, coccidiosis...	Antiparasitics
Fungal	Athletes foot, thrush, vaginal candida ...	Antifungals
Helminthic	Tape worm, round worm ...	Anti-helminthics

Both (bad) **bacteria** and **viruses** are harmful infective agents that spread via contact with contaminated surfaces, infected pets, sharing bodily fluids, consumption of contaminated food, or even aerosolized droplets from sneezing or coughing.

The pharmaceutical intervention for all infectious agents differs across microorganisms even within the same category, i.e., bacteria. Antivirals are taken to reduce viral replication. Antibiotics, on the other hand, do no work on viruses. This is why doctors have to use clinical decision-making skills and physical exams to ensure that they are prescribing antibiotics correctly. Primarily because of antibiotic resistance sensitivity of the microorganism to only a select few agents and the fact that beneficial bacteria in the gut will be eliminated during the process, which may cause new health issues to arise.¹⁶⁶

Innate vs. Adaptive Immune responses

The immune system is the body's bio-active shield that protects the body from foreign invaders like bacteria, fungi, viruses, and

environmental toxins. It accomplishes this using a variety of white blood cells that specifically target each type of threat. This is called the immune response. Two general systems are used to fight off infections: 1) The Innate Immune Response and 2) The Adaptive Immune Response.

1/ The Innate Immune Response

This is known as the fast and nonspecific acting immune response. There are a number of physical barriers in the body that help us keep pathogens out. These include skin, mucous membranes of the mouth, nose, and throat, which all contain immune cells. Chemical defenses such as our stomach acid also fight off pathogens. Macrophages, a type of white blood cell, fight off invaders by engulfing and destroying them. Many infections are being repelled this way in your body every day, and you don't feel a thing. Natural killer cells are also involved in this immune response and target tumors and infections.

2/ The Adaptive Immune Response

This is known as the slow and specific immune response. This response depends on whether the pathogen is recognized by B and T lymphocytes (types of white blood cells). These cells have the ability to remember the pathogen and exist in our lymph nodes. The adaptive immune response also breaks into humoral and cell-mediated immunity.

Without the proper functioning of our immune system, we would contract pretty much any infection within a few days. Infectious diseases occur when the pathogens can outsmart our immune responses and establish a local site of infection as a base for further replication and transmission.¹⁶⁷ Often we see this

occur with viruses more readily as they use our cell machinery to continuously change and disguise themselves in a way that our body has not previously recognized.

Vaccines and immunization

Vaccines provide immunity to a disease without acquiring natural immunity to the disease itself, using a small piece of a virus or a bacteria that will not cause illness. Your immune system can then target this piece of the pathogen, destroy it, and remember its properties in the process for a potential second invasion from the same pathogen. The benefit is that this piece is not an active virus or bacteria that can take over and cause illness. The symptoms that are felt after being vaccinated are your immune system reacting to the foreign agent. Now, as you are vaccinated, when your body naturally comes across the real infectious agent, your immune system can target and destroy the pathogen showing but mild symptoms or none at all. However, vaccine immunity to certain pathogens that replicate more rapidly does fade over time, which is where booster shots come in. The next table shows some vaccines that are already approved for human use.

Bacterial	Viral
Tuberculosis	Mumps, measles, and rubella (MMR)
Diphtheria	Poliomyelitis
Tetanus	Typhus
Pertussis	Typhoid
Haemophilus Influenzae Type B	Herpes Simplex Virus (HSV)
Cholera	Rabies
MRSA	Viral hepatitis

Streptococcus spp.	Varicella-Zoster Virus (VZV)
Staphylococcus spp.	Ebola
Typhoid	MERS-CoV SARS-CoV SARS-CoV2

If most people are vaccinated in a timely manner, the spread of disease is blunted. Protecting unimmunized individuals, including those who cannot be vaccinated and those for whom it was unsuccessful. The very young, the elderly, and immune-compromised individuals have a higher risk of infection due to immune system under activation or underdevelopment. Even if people contract the disease, they can't pass it on to vaccinated people, which stops the disease from spreading passed the vaccinated people. I.e., in the case of chickenpox in vaccinated people, the pox never forms on the skin, and thus the virus can't shed and infect others.

As a healthcare professional, I rely on clinical experience and best evidence research to determine how to treat my patients. I will never say I dislike all drugs or tell people never to get a vaccine. There are often two identical drugs with different generic names that have the same function in the body. Research will show that although they are both effective, overall, one reduces mortality and morbidity to a higher degree than the other. This is what I base my clinical decision-making on. The third being patient preference. Similarly, depending on the contagiousness of the disease or how effective we have found the vaccine to be, the pros and cons of the vaccine and its side effect profile are all things I discuss with my patients.

I want to discuss the **flu vaccine** as an example; The media report that **flu vaccines** have an effectiveness of approximately 68%. But what does this mean exactly? What is the absolute reduction in risk? Are there long-term benefits? **Vaccine** effectiveness is a relative risk. A 68% effectiveness is equivalent to having a one in three chance of acquiring the **flu** if you get a **flu** shot. When you do not receive the **flu vaccine**, you have a 7.0% chance of catching the **flu**; this is a 1 in 14 chance. However, when you get the **vaccine**, your risk reduces by 68%, from 7% to 1.9%. Consequently, the absolute risk reduction is 5.1%. You went from a 1 in 14 chance to 1 in 111 of catching the **flu**. Twenty healthy adults need to be vaccinated to prevent one case of laboratory-confirmed **influenza**. Of course, if you are a healthcare professional who often comes into contact with the **flu**, an elderly, or an immune-compromised individual, your baseline risk is higher than 7%.^{168 169} Twenty-eight children over the age of 6 need to be vaccinated to prevent one case of laboratory-confirmed **influenza** and eight children to prevent one symptomatic case. A Cochrane review states that 71 healthy adults need to be vaccinated to prevent just one of them from experiencing **influenza**, and 29 healthy adults need to be vaccinated to prevent one from experiencing an influenza-like illness.¹⁷⁰

There are also long-term benefits of obtaining the **flu vaccine** on an annual basis. Statistics show that if you get **flu** shots regularly, you'll typically get the first case of the **flu** in 38 years rather than 11 years. With annual **flu** shots, you have about a 5% chance of catching the **flu** at least twice in 20 years, whereas, with no **flu** shots, you have a 41% chance of catching the flu at least twice in 20 years.¹⁷¹

I provide you with these numbers so you can feel empowered with the knowledge to make up your own mind about getting the vaccine. It is also important to note that the most common side effects from the **influenza vaccines** are local soreness, redness, and tenderness or swelling. Low-grade fever, headache, and muscle aches may also occur. Guillain-Barré Syndrome (GBS) is one possible side effect of flu and other vaccines. However, about 1 or 2 people may get affected out of one million cases. This is much lower than the risk of severe complications from the flu, which the **flu vaccine** can prevent. GBS is also a side effect of the **flu** itself in severe cases, with a rate of 17 people per one million.¹⁷²

Many individuals are concerned about heavy metals like mercury, aluminum as well as preservatives like formaldehyde that are contained in vaccines. You can call ahead and ask for a vaccine without preservatives to be ordered into the clinic. Depending on the vaccine and your location, this may be available. Furthermore, from my research, as well as looking at environmental toxins that we are exposed to on a daily basis, the amount of these preservatives is nowhere near the concentrations of heavy metals we get from amalgam dental fillings or using aluminum foil to cover an oven roast.¹⁷³ I believe that if people are constantly working on their organs of elimination, avoiding as many toxins as possible on a daily basis, as well as eating a healthy diet, the vaccine if desired, is a small price to pay for immunity against a life-threatening disease.

► Takeaway #17

*Your risk of exposure to a disease, your occupation or living situation, your current state of health or ill-health, as well as the risks associated with catching a disease or getting a **vaccine**, i.e., death, or adverse effects, should all be factored in when considering whether you would benefit from getting any type of **vaccine**. I know this is not a black-and-white answer, but it's the best advice I can give. When it comes to the flu vaccine, you have to consider your exposure risk as well as individuals you interact with who are at high risk of a serious outcome if they catch the **flu**.*

About Autoimmune Diseases

Autoimmune diseases occur when your immune system mistakes self-tissue as foreign due to dominant or recessive genetic traits. They can be triggered by environmental stressors as well as personal stress, diet, and other lifestyle choices. So, *if autoimmune diseases run in your family, lifestyle changes will prevent the genes from becoming active.*

A typical example of an autoimmune disease is Hashimoto's thyroiditis, where your thyroid gland is not producing enough thyroid hormone as a result of your immune system attacking your gland. Other examples are rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), Celiac disease (CD), Sjogren's syndrome.

A strong immune response to fighting an infection may trigger an autoimmune disease. Many individuals will acquire

autoimmune conditions after a stressful life event, exposure to accumulated toxins in their lifetime, and other poor lifestyle choices or circumstances. Modulation of the immune system to prevent an overactivation or an underactivation is key in preventing autoimmune diseases.^{174 175}

Herbs For Improving the Immune System

The fascinating thing about herbal medicine is that plants have a multitude of *phytonutrients, chemicals, and vitamins*. Depending on the condition of their environment, they may carry more or less medicinal properties. Some plants have multiple actions in the body, as they are not simply one chemical constituent like a drug.

Many herbs also interact with drugs and may cause photosensitivity and other adverse reactions. Many herbs are also dose-dependent for not only their action but toxicity. Make sure you are aware of this and approach herbal medicine in a safe manner.

Herbs	Respiratory and Immune System herbs												References
	A V	A B	A F	A P	A n P	A H	A N	I M	I S	A I	D		
Garlic <i>Allium sativum</i>	✓	✓	✓					✓			✓		176 177
Ginger <i>Zingiber officinale</i>								✓			✓	✓	178 179
Onion <i>Allium cepa</i>			✓					✓	✓				180 181

<i>Hypericum perforatum</i>									
Propolis	√	√					√		198 199 200
Goldenseal <i>Hydrastis canadensis</i>		√		√		√	√		201 202 203
Juniper Berry <i>Juniperus communis</i>		√	√	√	√		√		204 205 206 207 208
Common Wormwood <i>Artemisia Absinthium</i>	√		√		√	√			209 210 211 212
Sweet Wormwood <i>Artemisia annua</i>			√						213 214
Astragalus	√					√	√		215
Siberian Ginseng <i>Eleutherococcus senticosus</i>						√	√	√	216
Asian Red/ White Ginseng <i>Panax ginseng</i>						√		√	217 218
American Ginseng <i>Panax quinquefolius</i>		√				√	√	√	219 220
Coneflower							√		221 222 223

<i>Echinacea spp.</i>								
Licorice Root <i>Glycyrrhiza glabra</i>	√	√				√	√	224 225 226 227
Skullcap <i>Scutellaria baicalensis</i>	√				√	√	√	228 229 230 231

AV: Antiviral; AB: Antibacterial; AF: Antifungal; AP: Antiparasitic; AnP: Anti-pyretic; AH: Anthelmintic; AN: Antineoplastic; IM: Immune Modulating; IS: Immune Stimulating; AI: Anti-inflammatory; D: Diaphoretic.

Physical Exercise and Immune Health

Once again, the incorporation of a regular exercise regimen has astounding effects on the health of the immune system, even more than any herb, supplement, or nutrient. When you exercise, you are burning fuel that is released as heat. This heat helps your body fend off viruses and bacteria. Exercise also moves the lymphatic fluid in the vessels, which moves immune cells throughout the body so that an infection can be detected by the immune system effectively.²³²

From my experience, the physically fit is often resilient to stress, his immune system is strong, his metabolic health is more than optimal, and his metabolism is always efficient. Maintaining regular exercise is an effective way to fend off any illness and strengthen immunity.

At-Home Treatment for Benign Ailments

Often illnesses worsen to the point that they require excessive measures because people disregard early signs and symptoms when the disease could have been prevented.

The following are some great ways to respond to signs and symptoms of an infection in its early stages, assuming there are no other underlying issues. You likely have many of these accessible to you at home or easily accessible as natural alternatives over the counter. You just have to know what to look for.

For Ear Infections

Garlic mullein ear drops are an oil-based product that has excellent antimicrobial and anti-inflammatory properties. In combination with acetaminophen, if the ear pain is severe in the absence of fever, it can effectively prevent the need for antibiotics.

For Sinus Infections

Individuals who have a build-up of sinus mucus and discharge may benefit from using a Neti-Pot or Neil-Med to rinse the sinuses on a daily basis for a short period of time. It is important to boil the water and let it cool to body temperature before use. This method also works for pollen-related allergies.

For Sore Throat

Saltwater gargling is a great way to reduce itch and inflammation in the throat. Salt is also an antimicrobial. Use it in the first signs of sore throat in the morning and at night before bed. It is also better to boil this water and use it slightly warm. An oxymel, a combination of vinegar and honey with macerated herbs inside, such as garlic, onion, thyme, and ginger, is a great way to soothe a cough or an irritated throat.

For Early Signs of Eye Infection

A soaked black tea bag (can alternate with green tea as well) is an effective way to decrease inflammation, itch, and kill bacteria, although its antimicrobial properties are not strong. Remember never to overlook a badly infected eye or try to fix it with a simple tea bag.

For Lower Respiratory Infections and Other Respiratory Conditions

Anything that causes any type of phlegm build-up in the lungs benefits from a humidifier. A room humidifier, steam inhalation with essential oils, or steam shower are all excellent ways to thin out the mucus in the lungs. Thyme essential oil is great for this purpose.

Common Cold or Flu

Colds and flu's compromise the most common respiratory infections. Viruses are often the culprit.²³³ The common cold, caused by various viruses, primarily affects the upper respiratory tract. Incubation periods or the time it takes for you to notice symptoms after contracting a virus are variable, and they depend on the virus type. Symptoms often consist of *a runny or stuffy nose, sore throat, cough, congestion, slight body aches or a mild headache, sneezing, and low-grade fever.*²³⁴ Influenza, aka “the flu,” on the other hand, usually comes with more severe symptoms, including *muscle aches, nasal congestion, sore throat, chills and sweats, headache, fatigue, and weakness, persistent and mostly dry cough, and fever reaching 39°C or higher.*²³⁵

The annual influenza vaccine is highly recommended to seniors, pregnant women, and healthcare professionals. Fortunately, not everyone is at risk of getting infected. If you are a healthy individual within the age range of 5 - 65, not suffering from an immune-compromised state, i.e., HIV/AIDS, you may

only experience mild to moderate symptoms. However, remember the point of vaccination is herd immunity. In order to protect the vulnerable, we vaccinate a certain percentage of the population (often a majority) so that we can prevent the spread of the illness. This has little to do with the robustness of your health as an individual. Even if you feel you are healthy and won't get extremely sick from the disease itself, you would still be spreading the virus more than if you were to be vaccinated. If you are vaccinated, you may never end up catching the illness in a way where you would shed the virus and infect others.

Fevers in Children

Fevers have protective roles in the immune system as the heat inhibits the reproduction and replication of many microorganisms. It is important to note that a fever is a symptom of an activated immune response and not an illness. Many parents are hesitant to take on a "watch and wait" approach to fevers due to the concern for seizures, especially if parents fall asleep and cannot monitor their child. However, antipyretics, like acetaminophen used for fever, may prolong the course of illness and do not decrease the recurrence of febrile seizures.

Sometimes parents may even incorrectly overdose antipyretics. Most fevers are short-lived and benign. Having the right tools and information on hand will help parents make the right decision.

If a fever above normal body temperature is present, but the child is eating and not fussy, then the fever is well-tolerated, and there is no need for medications. If a fever hits 103 °F and is climbing and the child looks uncomfortable, then an antipyretic

administration is warranted.²³⁶ If a fever is approaching 104 °F (38°C), but antipyretic medications work to bring it down, no emergency help is needed. In this latter case, if the child is not responding to the antipyretic medication and his fever is climbing, seek medical care by calling the emergency room and obtaining further instruction. Call an on-call nurse for dosing in children. You can see if you can reduce a fever naturally by using a cold compress over the forehead and the base of the skull over the back of the neck prior to using medications. A cold sock treatment is also a unique approach that helps draw the fever away from the head. Wet wool socks, ring them out and freeze them, then put them on. Remember never to submerge someone with a fever in a cold bath. It is also important to keep the child hydrated with water and broth.

► ***Takeaway #18***

*The best immune health supporting recipe combines embracing a **highly healthy diet** (in accordance with Part I), **vaccinating** against deadly viruses, reducing **stress** as well as utilizing **herbal alternatives**, and delaying the use of conventional medications to fight off illnesses.*

The Digestive and Excretory Systems

Many think of the **gastrointestinal system** as a closed system. When in fact, it should be viewed as an external system that interacts with the outside environment. The digestive system consists of a hollow tube that begins with the mouth and ends with the anus, going through the **esophagus** to the **stomach**, **small intestine**, **large intestine**, ending with the **rectum** and its opening back out to the external world. Other organs, like the **pancreas**, **liver**, and **gallbladder**, have their own contribution to the digestion process without being a part of the digestive tract. These are called “**Accessory Digestive Organs.**”

The digestion process starts in the **mouth**, where teeth and saliva help break down food into small pieces before the tongue pushes the pieces down into the stomach through the esophagus (a muscular tube that leads from the throat to the stomach).

Once the **stomach** is filled with food, it adds a variety of gastric acids and digestive enzymes while churning the food to break it down into smaller components. The stomach senses when it has done a sufficient job and thus pushes its content into the duodenum—the first part of the small intestine.

The **pancreas** releases pancreatic enzymes into the duodenum to further digest fats. The **liver** makes a digestive aid called ‘bile,’ made from waste products and excess cholesterol that help digest fats. Bile salts are stored and concentrated in the gallbladder to be released into the small intestine.

In **the small intestine**, chemical digestion takes place in order to break down the food materials into absorbable forms. The small intestine then absorbs carbohydrates, lipids, proteins, iron, vitamins, and water into the bloodstream. As peristalsis continues, the waste products of the digestive process move into the **large intestine** and pass through the rectum to the anus.²³⁷

Via a parallel pathway, the two **kidneys**, which represent one of the excretory system's main organs, filter the nourished blood and get rid of waste products in the form of urine. The urine is carried to the urinary bladder through two tubes called 'ureter(s)', one from each kidney. The urinary bladder stores the urine to be evacuated through the 'urethra' when full.

Healthy Liver, Healthy Skin

The liver is one of my most favorite organs that I often treat as a Naturopathic Doctor. It is responsible for filtering blood and getting rid of "gunk." Thus, it has a major role in detoxifying your body. Whether for the purpose of detoxing from alcohol or an excess of estrogens, the same foods and herbs are used. Accessible foods and herbs that work well to detox the liver include: *broccoli/broccoli sprouts, flaxseeds, healthy fats like avocado, blueberries, bitter greens like a dandelion leaf and root, artichokes, shiitake mushrooms, beets, onions, and garlic.*

Most of the abnormalities seen on the skin can be related to an overload in the gut and liver, putting many organ systems under pressure. Conditions such as acne, gas and bloating, and heavy menses are all related to an overburdened liver.

The Intestines

Normal bowel movements are defined as up to twice a day or 3-7 times per week. In my medical opinion, up to twice a day is optimal. On the other hand, diarrhea and constipation sometimes come as a result of an abnormal bowel movement.

1/ Constipation

In accordance with how we defined normal bowel movement, constipation is the case of having less than three bowel movements a week. These stools may be hard, dry stools as they have stayed in the colon too long and become dehydrated. Although other causative factors are worth investigating, some common reasons for constipation include dehydration from reduced water intake and lack of regular bowel movements due to reduced consumption of soluble and insoluble fibers.

There are a number of herbs that can quickly help with constipation. Senna is one of them. Senna helps to relieve constipation by stimulating the nerves in the gut to speed up the bowel movements, resulting in a laxative effect.

It is important to drink plenty of water with senna tea and to consume it at night. Start with a low dose, perhaps steep the tea bag for half the time. Only use senna for two days at a time and infrequently. Another herb is Cascara sagrada. However, there are some safety concerns.

Bitter spices and herbs like *chai* with *ginger* or *ginger* alone are gentler yet effective ways to stimulate a sluggish gastrointestinal system and can be used preliminarily in treating constipation. I often use bitter drops as digestive aids before and after meals to stimulate digestion. Digestive enzymes would be

the next step if bitters do not work to improve bowel movements and digestion.

2/ **Diarrhea**

Characterized by having more than three bowel movements a week of loose, watery stool, acute diarrhea is a very common condition. Many individuals are diagnosed with Irritable Bowel Syndrome (IBS). IBS is very common and simply describes that one can go to the bathroom many times a day, and it can alternate between diarrhea and constipation. Small Intestinal Bacterial Overgrowth (SIBO) is now being recognized as a branch of IBS. SIBO is caused by many things, including slow motility of the intestines, reduced digestive enzyme secretions, and the presence of unfavorable bacteria in the small intestine, causing bloating. It is important to do the appropriate testing to figure out the root cause of your gut symptoms in order to treat the underlying infection and re-establish healthy flora in the gut. You must know what you are treating.

Besides constipation-causing foods, which make up the “BRAT” diet (*Bananas, Rice, Applesauce, and Toast*), **cumin** is an excellent natural option to control diarrhea and effectively reduce its symptoms. Cumin attracted attention after studies showed beneficial effects in IBS. Ideally, it shines best in treating non-chronic diarrhea and other digestive problems like indigestion. ^{iError! Marcador no definido.} ²³⁸ **Oregano oil** also has beneficial effects as an antimicrobial in the small intestine and works effectively when used for two weeks at 50 mg two to three times a day.

Foods for the Gastrointestinal System

1/ Tan-Colored Foods

Omega-3 fatty acids, *wheat bran, corn bran, oat bran, whole grains, oatmeal, oat flour, barley, rye, fruit, and vegetables*; along with beta-glucan, found in dietary fiber, are all healthy for the gut. These foods are high in insoluble and soluble fibers and effectively contribute to the health of the digestive tract and its optimal functioning.

2/ Green-Colored foods;

Leafy green vegetables are an essential part of a healthy gut diet. They are packed with vitamins, minerals, and, once again, fiber! They are also well-known for their low-calorie content. *Broccoli, Kale, Romaine Lettuce, Swiss Chard, Water Spinach, and Collard Greens* are fiber and nutrient-rich vegetables that are necessary to feed the good bacteria in our gut and provide fiber, vitamins, and minerals.

3/ Prebiotics

Prebiotic foods feed the beneficial bacteria in your gut. Prebiotics are a form of soluble dietary fiber and come from pectins from *fruit, gums, mucilage's oatmeal, oat bran, barley, and legumes*. Prebiotics delay stomach emptying and transit time so that food is better broken down and nutrients are absorbed. Prebiotics also feed the good bacteria in our gut, maintaining the health of our bacterial populations.

By consuming prebiotics, our resident microbes ferment the soluble fiber and produce a variety of beneficial compounds like Short-Chain Fatty Acids (SCFA). One SCFA is butyrate, which is produced primarily by the bacterial fermentation of fiber in the colon. It has been extensively studied and shown to

be anti-inflammatory and improve memory by decreasing inflammation in brain cells.²³⁹

Good sources of prebiotic foods are *Asparagus, Avocado, Banana, Dandelion greens, Eggplant Endive, Radicchio, Garlic, Leeks, Onions, Honey, Jerusalem artichokes (sunchokes), Jicama, Kefir, Legumes, Whole grains (e.g., oats), Yogurt, Resistant starch: cooled and parboiled rice; tiger nuts; cooked and cooled potatoes, cooked and cooled legumes (soaked or sprouted)*.²⁴⁰

4/ Probiotics

Probiotics live in fermented foods. Foods fermented in salt rather than vinegar have probiotics that help with the overall health of the gut by introducing healthy good gut bacteria. Fermented *dairy products* are also a source of probiotics that provide us with beneficial bacteria.

Probiotics are beneficial living microorganisms. They help control the overgrowth of bad bugs and yeast and restore the healthy composition and function of the gut microbiome.^{241 242}

Probiotic supplements aren't usually found on the markets unless at exorbitant prices due to the high demand. However, you may be fortunate enough to know you could get an adequate supply of probiotics from a wide array of foods.

Good sources of probiotics are fermented vegetables (*sauerkraut, kimchi, pickles, beets, carrots*), fermented fruits (*chutneys, jams, green papaya, pickled jackfruit*), fermented condiments (*homemade ketchup, relishes, salsas, pickled ginger*), *water kefir, homemade coconut milk or cashew yogurt, beet kvass, natto, miso, tempeh, tamari sauce, sourdough, sour cream, and buttermilk, as well as kombucha, a fermented beverage.*²⁴³

5/ Insoluble Fibre

As perfectly detailed in Chapter 01, the human body does not digest insoluble fiber as it is poorly fermented. Insoluble

fiber stimulates the emptying of the gallbladder, which stores excess cholesterol in the form of bile salts. Lignin bind to these bile acids, carrying them out of the body through excretion, which lowers cholesterol levels by not allowing their reabsorption. Insoluble fiber keeps you satiated. It increases fecal bulk and reduces the time it takes to have a bowel movement. Without insoluble fiber, gall stones slowly form, especially in individuals consuming a high-fat diet.

Herbs for the Gastrointestinal System

	DB	CM	AM	AS	D	References
Yarrow <i>Achillea millefolium</i>	✓	✓		✓		244 245 246
German Chamomile <i>Matricaria recutita</i>	✓	✓	✓	✓		247
Black Pepper <i>Piper nigrum</i>	✓	✓	✓			248 249
Clove bud <i>Syzygium aromaticum</i>	✓	✓	✓			250 251
Fennel seed <i>Foeniculum vulgare</i>		✓	✓			252 253
Star Anise <i>Illicium verum</i>		✓	✓			254
Peppermint <i>Mentha piperita</i>		✓	✓			255 256
Spearmint <i>Mentha spicata</i>		✓	✓			257
Ginger <i>Zingiber officinale</i>	✓	✓	✓			258 259
Licorice root		✓	✓		✓	260 261 262

<i>Glycyrrhiza glabra</i>					
Cinnamon (Ceylon) <i>Cinnamomum verum</i>	✓	✓		✓ (cold infusion)	263
Marshmallow Root <i>Althaea officinalis</i>				✓ (cold infusion preferred)	264
Slippery Elm <i>Ulmus rubra</i>				✓ (cold infusion preferred)	265

DB: Digestive bitter or stimulant; CM: Carminative; AM: Antimicrobial; AS: Antispasmodic; D: Demulcent

► Takeaway #19

Drinking plenty of water and consuming a wide variety of fruits and vegetables will help your body detoxify and ensure optimal digestive function. Our gut microbiome is responsible for our mood, adequate nutrient absorption, energy levels, and more. Adequate digestive juices are also extremely important for appropriate digestion.

Fasting for Your Health

Fasting is one of the quickest ways to increase the elimination of wastes and enhance the reparative process of the body. Scientific research into fasting has existed since the early 1900s. Medical journals have carried articles on the benefits of fasting in

diabetes, obesity, psychological illnesses, arthritis, heart disease, skin disease, and toxic poisoning.

Fasting may result in a reduction in weight, improvements in skin health, tissue repair, decreased pain and inflammation, increased concentration, and improved focus. In the long run, it is associated with better-controlled blood sugar, blood pressure, and pulse. New research on intermittent fasting (IF) has even demonstrated change on a genetic level contributing to metabolic benefits via the liver.²⁶⁶

Fasting preserves the organelle quality of mitochondria via the autophagy-lysosome pathway to enhance pancreatic beta-cell survival and stimulate markers consistent with regeneration in obesity-induced diabetes in mice studies.²⁶⁷

Based on recent evidence, fasting may serve as a therapeutic approach for ameliorating vascular dementia pathology and preventing its onset.²⁶⁸ Vascular dementia, according to the Mayo Clinic, is a « general term describing problems with reasoning, planning, judgment, memory, and other processes caused due to brain damage from impaired blood flow to your brain. »²⁶⁹

Keep In Mind:

There are no concerns about any health implications to do with fasting. As humans, we have adapted biochemical mechanisms that allow us to forgo the consumption of food for days at a time. After all, I am not discussing multiple-day fasts but only 13-16-hour intermittent fasts. Exercise is discouraged while fasting, for it is essential to conserve energy that allows for maximal healing to take place. You may initially feel cold and fatigued. But, over time, you will start to adapt to fasting for long hours.

Ideally, you don't want to begin a fast during a stressful time. Your energy needs to go towards healing. During fast, your

brain cells get to the point of starvation, and they begin to engulf dying or damaged cells. This is ideal for people with scar tissue or trauma, i.e., concussions or sports-related injuries.

Try to stay away from doing detoxes at the same time or things like colonics or enemas during the time of fasting. Individuals who are depleted, feel fatigued, have endocrine abnormalities such as low libidos, thyroid, or adrenal hormones, should work on their overall health before attempting fasts, especially extreme fasting or exposure to cold plunges. In an individual who regularly eats and has a stressful lifestyle, fast may trick their body into thinking there is an actual food shortage. The body does not always respond kindly and will start to stress out. Even abrupt calorie cutting in a fitness plan has often cost many women the health of their hormones. For women, our adiposity is important for our sex hormones, and we often respond more extremely to stressful stimuli.

I bet you have heard the term “feed a cold, starve a fever.” There is some merit to this, but one needs to understand it better. When we are sick, we naturally lose our appetite. Most individuals suffering from a bad cold or flu are the ones whose immune system is weakened. Nutrients are very important to help nourish your immune system. When you eat, your immune system also has to deal with the proteins in your food and fend off infections, which distracts it from killing illness-causing bacteria and viruses. Nonetheless, your immune cells still need to obtain nutrients somehow to be able to function properly. In this case, I do recommend vitamins, herbs, and good nutrient-dense foods to support the immune system, especially if you are relying on soups and broths that are very simple and not nutrient-dense.

Breaking Fast

	Day 01	Day 02	Day 03
Breakfast	One of the following: Pear, 1/2 melon, ¼ pineapple, nectarine, peach, plum, mango, cherries	12 oz. 1 type of fresh fruit	Resume a regular healthy diet (<i>raw fresh fruits, raw/steamed vegetables, whole grains, nuts, seeds, and legumes</i>)
Lunch	Different fruit from breakfast list	14 oz of whole pears, papaya, or other fresh fruit	2–3 meals each day, preferably with no snack (unless having blood sugar issues)
Dinner	8 oz. of any fruit	Raw vegetable salad with leafy green lettuce, tomato, celery, cucumber, or 2 pears, 2 apples ½ avocado.	

► **Fakeaway #20**

Fasting is an ideal part of a health-optimizing program that proved effective and helpful at many levels.

In proceeding, start with a short intermittent fast first. In the evening, at about 7 pm, stop eating altogether except for drinking water.

When you wake up, go about your day, drink water, and when you start to feel hungry, wait for about 30 minutes, then eat. Just when you do so, make sure that you have nutrient-dense foods.

Always listen to your body and adjust accordingly. By doing this, you can slowly work your way up to a 15-hour fast, which you can finally break as suggested in the last table.

The Nervous System

From a simple blink of an eye to the most complex of functions, *including the mechanism of speech, how we breathe and digest food, even the build-up of memories and the exploration of the surrounding world through our senses;* None of those actions would be possible without the orderly functioning of all the pieces that make up the nervous system.

The nervous system involves every single nerve in the body, and it is divided into two parts: Central and Peripheral. The **brain** and the **spinal cord** make up the Central Nervous System (**CNS**), while the nerves in our extremities make up the Peripheral Nervous System (**PNS**). The PNS is in charge of skeletal muscle control as well as sensation.

For instance, if you hold a very hot cup of tea, the nerves in your hand (**PNS**) send a danger signal across neurons to your CNS that says, “this hurts.” Therefore, your nervous system responds by immediately releasing the hot cup without even consulting you. This is known as a reflex arc. It is a signal that never even reaches your brain, though you can make send of it after it has happened.

A healthy nervous system is associated with alertness, good mental well-being, cognitive ability, and lack of pain, numbness, or tingling.

Diaphragmatic Breathing and the Nervous System

Many of us go through life operating primarily via the **sympathetic branch** (“*fight or flight*”) of our **autonomic nervous system** as opposed to the **parasympathetic** (“*rest and digest*”) **branch**. This is because we lead a highly stressful lifestyle. We move and exercise infrequently and often have stressful jobs with many at-work and at-home responsibilities. We no longer live in tribes and help each other with shelter, food, and raising a family.

If we were to face a natural stressor in nature, it would be temporary, and our stress response would soon settle down. However, with the current North American lifestyle, the majority of people have a high-stress response all day, almost every day.

Thus, we must incorporate activities that bring about stillness and activate the parasympathetic branch of our nervous system. Yoga, meditation, a relaxing walk, or any hobby that helps us center ourselves can help us stimulate the parasympathetic branch of our nervous system and dampen the constant sympathetic response. One unique technique that has a direct impact on stimulating our parasympathetic nervous system *even if we cannot get ourselves to a more tranquil mindset* is **diaphragmatic breathing**.²⁷⁰

The **diaphragm** is a skeletal muscle that sits at the chest cavity base and functions primarily during active breathing to pull air into the lungs. Diaphragmatic breathing, also known as *belly breathing*, strengthens this muscle, improving lung capacity and stimulating the parasympathetic nervous system via the vagus nerve. The more this technique is practiced, the more this type of breathing becomes natural, putting us into a more

parasympathetic state, which eventually helps us better adapt to stressful stimuli in our day-to-day lives.

► Takeaway #21

Diaphragmatic breathing may reduce cortisol levels, subsequently improving stress and mental health.²⁷¹

In essential hypertension, slow breathing generally improves arterial baroreflex sensitivity and decreases blood pressure.^{272 273} This form of “Autogenic Training” even has an impact on the gastrointestinal system, improving symptoms in patients with Irritable Bowel Syndrome (IBS).²⁷⁴

How to Breathe Diaphragmatically?

You want to begin by setting 10 minutes aside from your day to do this exercise and work your way up to 20 minutes twice a day until it becomes natural to you. You can choose to practice this anywhere, in any position, as it will still be helpful. The goal is to regulate your breathing as frequently as possible.

The ideal way is to sit upright with your legs parallel, both feet flat on the floor, with thighs slightly opened, making sure your chair is high enough for a slight decline in the angle of your thighs as opposed to an incline or straight out. Sit up straight as if you are squeezing something small between your shoulder blades with good posture.

Breathe in through your nose and out through either your nose or mouth. When you breathe out, imagine pushing

molasses through a straw. Breathe in and out in a controlled, consistent manner for the most vagal stimulation. Placing one hand on your belly will help remind you to push your belly out via your diaphragm to help inflate your lungs while your chest remains still as you breathe in and out.

Usually, exhalation should be about a second or two longer than inhalation. A good breathing rate is about six breaths per minute. I recommend 4-5 seconds duration for inhalation and 5-7 seconds for exhalation. Remember, it is not about breathing deeply but slowly and in a controlled manner. If you feel you are getting dizzy, you are likely hyperventilating, taking too large, or too frequent of a breath.

Sleep and the Circadian Rhythm

Why is sleep so important? Getting adequate sleep gives you renewed vitality and energy with which you can reach your full potential. According to Dr. Janet Opila-Lehman, ND, “*Long-term health depends on the regeneration that occurs during deep sleep. Growth hormone, or the “anti-aging” hormone, is secreted during sleep, which stimulates tissue regeneration, liver cleansing, muscle building, break down of fat stores and normalization of blood sugar. During sleep, free radicals are scavenged in the brain, minimizing its aging. Many health problems are aggravated by inadequate sleep. Sleep gives us renewed vitality, a more positive outlook on life, and energy with which we can become our full potential.*”²⁷⁵

If you are having trouble with sleep, especially from traveling or working night shifts, you can try “earthing” (aka grounding) to reset your circadian rhythm. Going about our unnatural world, our bodies develop more *positive charges*.

Reconnecting with the earth's *electrons* or *negative ions* has shown the promotion of physiologic and subjective reports of well-being. Earthing may help improve sleep via regulating the circadian rhythm, reducing inflammation, controlling heart rate variability (**HRV**), a key indicator of overall health, balancing hypercoagulable blood, and reducing pain. All it takes is having your bare skin touch the earth in any way that conducts the earth's electrons from the ground into the body, e.g., walking barefoot on a golden beach or lying on the grass for a moment. It is all about creating direct contact between the body and nature.²⁷⁶

Manage Your Stress, Manage Your Mood

There are varying human emotions that impact cognition, planning, attention, memory, and even decision making. Emotions such as fear, anger, anxiety, sadness, and happiness—All emotions are meant to be temporary. We were meant to experience **short-term stress** for survival in nature to keep us alert, to decrease inflammation and sense of pain. These short-term stressors have even shown positive effects on the immune system.²⁷⁷

Medically, such stressful situations are known as "**acute stressors**," short-lived threatening situations. In such cases, the nervous system (CNS) stimulates the endocrine system (adrenal glands) to produce 'adrenaline' and 'norepinephrine.' But once the crisis is over, both stress hormones return to normal levels with no long-lasting effects.²⁷⁸

However, prolonged periods of fear and anxiety give rise to **chronic stress**, where the endocrine hormones are continuously produced, overexerting our adrenal glands, resulting in long-

lasting anxiety and fatigue. The constant release of cortisol begins to cause blood sugar irregularities, weight gain, water retention, damped immune response, and poor sleep.²⁷⁹ Constant stress hormone production contributes to increased cardiovascular risk, brain dysfunction, and hormonal irregularities.^{280 281}

► Takeaway #22

Chronic stress is associated with several poor health outcomes like an increased risk of viral infections, especially in people with a sedentary lifestyle. Asthmatics may experience more severe bronchoconstriction due to increased histamine production. At the same time, blood sugar dysregulation caused by chronic stress may put individuals at a higher risk for diabetes mellitus, as insulin needs shift.²⁸²

Cold Immersion Therapy

Originally carried out as baths (immersions) and modern days adapted to showers (contrast showers), cold immersion therapy has become “trendy” in its fashion. Depending on the individual’s health or vitality, they may need to begin with a warm (rather than cold or ice) contrast or immersion therapy alternating with hot if they are ill and have poor vitality.

For the Extremely **HEALTHY**

That requires full immersion, including the head.

However, the entire body has to be warm before entering the cold water, as in post-workout. If one is already chilly or cold, they must not enter the cold water until they have warmed their body. To take a cold full bath:

1. Lie down in the water for 1 minute.
2. If you are perspiring, sit in the water until it reaches the middle of the chest and rapidly wash over the upper body with a towel or sponge.
3. Dress immediately and start to exercise for 15 minutes or until the body has regained its normal temperature.

Anyone should take more than three such baths every week. Still, especially in women, it can shock the endocrine system and cause side effects—approach with caution. In the case of taking a shower rather than a bath, follow the same protocol with the coldest shower you can handle after a warm or hot one (excluding the head in earlier attempts).

For the **HEALTHY**

Sit in a cold bath with the water reaching only to the armpits. In this case, the upper chest and neck must be rapidly washed over with a soaked towel. The shortest duration of this bath is half a minute; the longest is three minutes. In general, the shorter the bath, the more efficacious the results. Make sure this bath does not contain ice. It should simply be as cold as tolerable. You may choose to start with slightly warm water in the earlier trials. In the case of a shower, follow the same protocol with the coldest shower you can handle after a warm or hot shower (excluding the head in earlier attempts). Alternate with 30 seconds of warm and 30 seconds of cold for three cycles. End on

cold and when you dry off, move the body with some simple exercises to warm up once more.

For the ILL

In the past, in cases of a violent fever (not cold), a cold bath was advantageous compared to the medications available in the 1800s. Currently, medicine advises against icy cold baths to bring down a high fever. Using a cool compression to the back of the neck is sufficient to bring down fever but only for a few minutes while monitoring body temperature. A cold bath is not recommended to bring down a fever as cold water can increase core body temperature by cooling the skin and causing shivering. In general, if *someone's energy is low, they are fatigued, have hormonal issues, are not eating well, and simply have low vitality*, doing any kind of contrast or immersion cold therapy is not advised. In this case, consider a **tepid (lukewarm) bath** to stimulate the immune system. Make sure the individual ends on a warm to tolerable, hot shower to warm up, as their body may not be able to warm up on its own, or if they are not able to exercise afterwards to warm up their body, as we discussed with the cold immersions.

Herbs for the Nervous System

The following are common herbal preparations that I consistently use for mild to moderate cases for a variety of common complaints.

	GAD	DP	MD	SD	Resources
Lavender flower <i>Lavendula officinalis</i>	√	√		√	283 284 285
California Poppy <i>Eschscholzia californica</i>	√			√	286 287
German Chamomile <i>Matricaria recutita</i>	√			√	288 289
Yerba species <i>Eriodictyon spp.</i>			√		290 291
Rosemary leaf <i>Rosmarinus officinalis</i>	√		√		292 293
Gotu Kola <i>Centella asiatica</i>			√	√	294 295
Maidenhair tree <i>Ginkgo biloba</i>			√		296
St. John's Wort <i>Hypericum perforatum</i>	√	√		√	297 298
Passionflower <i>Passiflora incarnata</i>	√			√	299
Skullcap	√		√	√	300 301

<i>Scutellaria spp.</i>					
Valerian root <i>Valeriana officinalis</i>	√			√	302 303 304
Lemon Balm <i>Melissa officinalis</i>	√	√		√	305 306
Black Pepper <i>Piper nigrum</i>	√	√	√		307

GAD: Generalized Anxiety Disorder; DP: Depression; MD: Memory and Dementia; SD: Sleep disorders.

Foods for the Nervous System

Omega-3 fatty acids such as EPA, DHA, and ALA are healthy fats that greatly support overall health. Together, DHA and EPA may help reduce inflammation and the risk of chronic illness, such as heart disease. On its own, DHA supports brain function and eye health, for such nervous tissues are partly made up of fats and have a special preference for DHA in particular.³⁰⁸ Studies have shown that people with Alzheimer's disease have lower levels of DHA in their brains than older adults with good brain function.³⁰⁹

Besides supplementation, foods high in DHA include **salmon, tuna, trout, mussels, oysters, cod, pickled herring, clams, and snow crab**. Pregnant women should avoid **mackerel, swordfish, and striped bass** due to their potential mercury content. **Ground flaxseed, walnuts, chia seeds, tofu, navy beans, and avocados** do not directly supply the body with DHA, but they contain ALA, which is converted to DHA in the body.

Other colorful foods that are blue, purple, or crimson in color, such as *berries*, *cherries*, and *dark grapes*, contain bioflavonoids and resveratrol. These are important antioxidants that are beneficial for vascular health, especially for brain health.^{310 311}

► Takeaway #23

*Besides including the **foods** mentioned above into your diet and working with a naturopathic doctor to improve your nervous health with the right **herbs**, practicing **diaphragmatic breathing** on a daily basis, maintaining good sleep and proper **circadian rhythm**, managing **stress**, and trying **cold immersion therapy** in accordance with the protocols described above represent the foundations of optimal nervous system health.*

*Paying close attention to the health of your **gastrointestinal system** is also essential due to the gut-brain axis. Many neurotransmitters made in the gut are also made in the brain. If your gut is unhealthy, you will begin to see changes in mood.*

The Musculoskeletal System

The musculoskeletal system comprises the muscular and skeletal systems. The muscular system receives information from the nervous system. This allows for the entire musculoskeletal system to accomplish movement. There is constant sharing of information between the brain and the body, contributing to form, support, stability, and movement.

Our skeletal system serves a few other roles besides the human frame. It stores calcium and phosphorus, as well as other minerals. Besides housing fat, the bone marrow contains cells that will become white and red blood cells. The skeletal system is joined together by **ligaments** that hold **joints** in place and allow muscle **tendons** to pass over joints for movement. The musculoskeletal system also protects our organs and stores fuel and energy for the body.

A healthy diet, strength and aerobic exercise, and promotion of functional mobility, as well as the proper protection against **injuries** and all potential threats—all together contribute to the health of our musculoskeletal system.

That being said, the main threat to the musculoskeletal system comes from trauma-related **injuries**. Regenerative medicine offers excellent tools to address trauma-related joint injuries with prolotherapy and platelet-rich plasma therapy. Treatment success depends on the patient and the type of injury, so speak to your doctor for a referral to an orthopedic specialist.

or see a naturopathic doctor in your area that specializes in regenerative medicine.

Chiropractic adjustments also have a place in recovery from trauma. I have found them to result in complete resolution of pain from injury-related conditions and recommend them as the first line for short-term therapy and less often for maintenance in combination with strength training exercises.

Research is inconclusive in regards to **calcium** supplementation for improving bone density and reducing the risk of osteoporosis. Calcium itself does aid in the proper propagation of nerve signals in the heart and skeletal muscles, hormonal modulation, as well as blood clotting, as it provides protection against cancer, diabetes, and high blood pressure when combined with Vitamin D3.

A daily diet containing high amounts of calcium-rich foods—such as dark leafy green vegetables like *kale, broccoli, and fish with soft edible bones*—should provide adequate supplies of calcium. Not to mention, getting your calcium from food sources puts you at a safe distance from calcium-related cardiovascular diseases such as **heart attacks** and **strokes**.³¹²

There is ample evidence regarding the best lifestyle factor that improves bone mineral density besides nutrition, being weight-bearing, and resistance **exercise**. The more regularly your bones experience weight-bearing pressure, the stronger they become. The muscle mass gained from exercising also has positive outcomes on increasing Bone Mineral Density (BMD).³¹³

Nutrients That Support the Musculoskeletal System

1. Vitamin D3

A number of studies have concluded that vitamin D3 has shown a positive effect on muscle strength.³¹⁴ It is found to be associated with reduced injury rates and improved sports performance for the individual;³¹⁵ While vitamin D deficiency, on the other hand, was found to be detrimental to muscle function.^{316 317 318}

2. Minerals

With over 99% of **calcium** storage in bones, this mineral serves as the bones' building block in the human body. Calcium from *fermented dairy, nuts, and soya beans*, or even from leafy green vegetables such as *broccoli and cabbage* helps us grow and build strong bones.

Also, **phosphorus** is another mineral with 85% being stored in bones. It binds to calcium, forming hydroxyapatite structures that contribute to bone strength. Rich sources of phosphorous are nuts and beans.³¹⁹

Epsom salt baths are an incredible way to reduce muscle tension and absorb **magnesium** naturally through the skin.

3. Protein

Combined protein intake with resistance exercise resulted in the greatest gains in muscle mass and strength, which have a positive association with BMD. The recommended average daily intake of protein is at least 1.0–1.2 g per kg body weight, including at least 20–25 g of high-quality protein with each main meal (breakfast, lunch, dinner) during the day.³²⁰

4. Other Micronutrients

Nutrients like *beta-alanine, creatine, fluorides, leucine, magnesium, omega-3 fatty acids, potassium, vitamin B6, vitamin*

B9, vitamin B12, vitamin C, vitamin E, vitamin K2, and zinc can maintain or improve muscle strength and bone mass.³²¹

5. Water

I don't think we can ever stress enough the importance of hydration for the body. In this case, water aids in cell communication and helps with healthy joints and the hydration of muscle tissues.

Musculoskeletal Health-Promoting Lifestyle Changes

Given that we spend almost half our lives sleeping, it's of no question that the quality of our mattress can affect our sleep, musculoskeletal, and overall health. Depending on injuries, an **orthopedic mattress** may help alleviate stress on the spine and reduce pain. Choosing a low VOC (toxin) mattress is important, as many new pieces of furniture emit healthy gases. If you cannot assure this, make sure you leave an open window to air out the chemicals throughout the day, especially when you can smell it.

Daily habits also make a big difference in your overall health. This is why **posture** is such an essential part of our musculoskeletal health: *Pulling out shoulder blades back, sitting up straight with both feet on the ground, not extending the neck forward, and having a comfortable placement of your hands and arms on a table adjusted to your height.* This way, you can ward off pain experienced due to poor ergonomics.

Finally, **mobility**. Mobility is extremely important to prevent injury and also improve performance. Each of your joints has the ability to go through a full range of motion. Many injuries occur at the end ranges of these motions. Creating flexibility and extending these ranges as much as possible means that you can better sustain and recover from any injury. Strength

training at these end ranges of motion has been shown to deliver great performance results.

Types of Injuries in the Musculoskeletal System

Dr. Eric Berkson, *an instructor in orthopedic surgery at Harvard Medical School*, warns people who go to the gym or exercise regularly about five common exercise-related injuries:

« **1/ Sprains**—injuries to ligaments, the tissues that connect bones to one another.

2/ Muscle strains—injuries to muscles or tendons, the tissues that connect muscles to bones.

3/ ACL/ PCL/ MCL and LCL ligament and meniscus tears of the knee—a rip in a ligament that helps stabilize the knee or cartilage that cushions the knee joint.

4/ Rotator cuff tears—rips in the group of muscles and their tendons that hold the arm in the shoulder socket.

5/ Tendinitis—inflammation of a tendon, often due to overuse. »³²²

The health of our spine is of utmost importance. With improper form, injury often begins to accumulate, whether postural or from repeated poor ergonomics at work or play. Range of motion and flexibility can offer us some protection from trauma or the everyday accumulation of poor habits. I have witnessed how joint pain can cause lower quality of life due to the inability to exercise or attend to hobbies. Furthermore, the lack of exercise begins to trickle into cardiovascular disease, metabolic disease, and poor mental health. In fact, stress can also exacerbate the pain and symptoms of depression and anxiety.

Musculoskeletal pain often demonstrates considerable improvement with minimal intervention in about two weeks.

However, trauma-related injuries should always be worked up with a healthcare professional.

Many people believe that immobilizing a joint is the most productive thing to do. This is mainly true only when you break a bone. Otherwise, in the first 48 hours after an injury, you should always consider **RICE**:

R- rest

I- ice

C- compress

E- elevate

How to Avoid Injuries in the First Place?

During motion, and more likely during a workout session, there is always a chance of sustaining an injury, such as muscle strain or a sprained joint. Anyone may encounter such workout injuries regardless of one's experience or fitness level. However, following some simple workout precautions may substantially cut the risk of getting one.

Starting from shoes, the Mayo Clinic suggests that walking shoes, as well as running shoes, must meet the following criteria:

« Heel collar; Cushions the ankle and ensures a proper fit.

Achilles tendon protector; Reduces stress on the Achilles tendon by locking the shoe around the heel. This is how basketball shoes are designed.

Upper; Holds the shoe on your foot and is usually made of leather, mesh, or synthetic material. Mesh allows better ventilation and is lighter weight.

Insole; Cushions and supports your foot and arch. Removable insoles can be laundered or taken out to dry between

walking sessions. A chiropractor or podiatrist will have a machine that can map out an insole unique to your posture. Some people may have a leg length discrepancy which is why this would be beneficial.

Gel, foam, or air midsole; Helps cushion and reduce impact when your foot strikes the ground. This may affect the speed in runners.

Outsole; Makes contact with the ground. Grooves and treads can help maintain traction.

Toe box; Provides space for the toes. A roomy and round-toe box helps prevent calluses. »³²³

In all cases, it is important to get a proper assessment. You will notice that many issues that arise at the feet are actually from an imbalance in muscle tone from constantly being in shoes that do not challenge the muscles in the foot. Arch drop and bunions are examples of the type of injuries that can occur from a poor muscular tone.

When exercising, consider stretching and a slow jog for 10 minutes to warm up before a workout. *“A proper warm-up can improve blood flow to the working muscle and reduce stiffness, potentially lowering the risk of injury,”* says Dr. Berkson.³²⁴

As you start exercising, you still need to move gradually from low, medium, to high exercise intensity. If the target exercise is new for you, start slowly at the lowest tolerable tension, where you can do three sets of 15 repetitions with a slight challenge and never increase load unless you have achieved appropriate form and only when you feel physically ready. Dr. Berkson warns, *“The greatest risk of injury comes with changing an exercise program or adding a new exercise”*³⁴¹

Finally, just like warming the body up before engaging in any physical exercise, engaging in a “cool down” session at the end is equally important to help prevent muscle soreness. This may consist of a full range of motion movements and stretches. A 10-minute session is about enough, but duration does not matter as long as major body parts are addressed with special attention to injury-prone areas.

► Takeaway #24

Bones, muscles, tendons, ligaments, and soft tissues make up the musculoskeletal system elements that support the body weight and ensure flexible movement.

Musculoskeletal health is highly linked to diet, exercise, and regular movement. Exercise and stretching are protective against injuries, while weight-bearing is essential for bone density.

A musculoskeletal-health-supporting diet should include proteins, vitamins, and minerals, especially vitamin D, calcium, phosphorus, and magnesium, with adequate water intake.

*As for **injuries**, they usually occur during workouts and less likely while walking for long distances. In either case, wearing the proper shoes as defined by the Mayo Clinic should significantly decrease the likelihood of getting such injuries. Never skip the “warm-up” and “cool down” sessions when you exercise. Switch gradually from low, medium, to high intensity, and when trying to change the exercise program or add a new exercise, approach with caution.*

In addition, pay attention to the ergonomics of your bed and chair, especially if you spend long hours in them.

CHAPTER

6

How to Prevent the 3 Most *Health-Threatening Body Failures*

Health has always been seen as a state that depends primarily on the presence or absence of diseases. Of course, that cannot make a complete definition for a term as broad and complex as “human health.” Still, if there were one, that part—the presence vs. absence of diseases must be considered, or else the definition would not be acceptable, given that soundness of health is almost impossible in a disordered body.

The WHO defines health as « *a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.* »³²⁵ However, and even in that context, consider how hard it is to achieve absolute mental and social well-being while suffering a sort of impairment or a physical infirmity!

Infirmities come in the form of a disease and a set of identifying symptoms. A disease is a particular abnormal condition negatively affecting a part of the structure or a single body function. That solely shouldn't raise concern in most

treatable and manageable cases. Still, within a complex body such as that of ours, everything is connected. And what affects the one channel may threaten your overall health. If not directly, it may happen through the very health-threatening treatment options, like medicines with potential side effects and strict diet changes that are usually imposed to treat and manage the given condition. Therefore, between untreatable diseases and health-threatening cures for treatable ones lies the valuable asset of the old adage, “prevention is better than cure.”

In this light, we find some diseases, like hemochromatosis, that are hereditary, and their prevention goes beyond one's control. Others are called communicable, for they pass through human-to-human transmission. To some extent, these types of diseases still fall under control and can be prevented through a series of standards and transmission-based precautions. As for the noncommunicable type of diseases, the mere maintenance of a healthy lifestyle in accordance with the preceding five chapters shall do. Other than that, there remain but some exceptional cases—**Cancer**, the silent killer, **Food Allergy**, where the preventive actions may not even involve the concerned individual, as well as some other common **digestive disorders** that require special awareness and extra preventive efforts—All of which to be covered in the pieces that follow.

Cancer

« Lung cancer (*with 1.76 million deaths*), followed by colorectal cancer (*with 862 000 deaths*), stomach cancer (*783 000 deaths*), liver cancer (*782 000 deaths*), and then breast cancer (*627 000 deaths*). »³²⁶

These world's most brutal cancers are contributing one-quarter of the whole number of cancer-related deaths. The number, which has miserably hit *9.6 million* by 2018.³²⁶ The remaining three quarters involve other 200 types of cancer, mainly classified by severity, stage, and the affected cells into:

« **Carcinoma**, which first takes place at the level of skin or tissues that line or cover internal organs.

Sarcoma; the cancer that starts in bones, cartilages, fats, muscles, blood vessels, or other connective or supportive tissues.

Leukemia; the one that begins in a blood-forming tissue like the bone marrow and produces large numbers of abnormal blood cells that enter the blood.

Lymphoma and multiple myeloma are cancers that first hit the cells of the immune system.

Central nervous system cancers are cancers that first affect the tissues of the brain and spinal cord. »³²⁷

What Is Cancer?

The NCI dictionary defines cancer as « *a term for diseases in which abnormal cells divide without control and can invade nearby tissues.* »³²⁸

Throughout the lifetime of the human body, cells normally die and are replaced with new ones: *Skeletal muscle cells turn over every 15 years approximately, intestinal cells have a lifespan of 10 years, while red blood cells last only for a maximum of 120 days.*³²⁹ On average, the normal human body cells are replaced every 7 to 10 years through a biological phenomenon known as apoptosis, which is a set of biochemical events that supervise programmed cell death and other changes. In cancer development, however, old cells abnormally survive and start dividing continuously and uncontrollably to end up with an abnormal formation of a solid cancerous tumor.

Cancer may cause detriment to the natural functioning of the body, whether by clogging some functional channels or by obstructing the work of certain body systems. Also, some cancers may result in harmful changes in the body when expanding at the expense of neighboring tissues and organs.

Leukemia (*blood cancer*) is a bit different since it does not involve any tumor build-up. It, rather, affects white blood cells, causing them to grow and divide rapidly until they outnumber the necessary components in the blood—the platelets, red blood cells, and the other healthy white blood cells.

Cancerous tumors are called '**malignant**', for they can spread and invade new tissues: Cancer cells are carried through the blood or the lymph system to distant places, where they may break off and form new tumors far away from where the first one took place. Even sometimes, the malignant tumor can grow back again after being surgically removed from the body.

Unlike malignant, benign tumors do not spread into nearby tissues and generally do not grow back when removed, although **benign brain** tumors can exceptionally be life-threatening.

Cancer Treatments

Despite the earnest pursuit of discovering more effective treatments and innovative therapies with fewer side effects, *chemotherapy, radiotherapy, hormonal therapy, or surgery* are still the primary approved options available in treating different types of cancer.

1/ Surgery

Cancer surgery is the most effective cancer treatment that provides the best chance for curing non-spreading cancers. It can be taken as a primary cancer treatment *where the cancerous tumor is surgically removed*, as it can be performed only to help the doctor with the staging and the diagnosis, involving the removal of a cancerous tumor or a part of it only to be studied and evaluated.

If cancer has spread, or in the case of cancer that starts in the blood system (leukemia), or in some cases where it starts in the lymphatic system (lymphoma), surgery might not be an option of treatment. Any surgical intervention would only manage cancer symptoms to improve the patient's life quality rather than targeting cancer itself in such cases.

Mostly the patient is supposed to undergo a traditional method of surgery. Still, other methods of performing surgery do not involve cuts with scalpels. Some common examples are:

Cryosurgery, where a very cold material such as liquid nitrogen spray is used to freeze and destroy cancer cells.

Electrosurgery that applies high-frequency electrical currents to kill cancer cells.

Laser surgery, where beams of high-intensity light are used to shrink or vaporize cancer cells.

The method of performing cancer surgery is chosen based on how much tissue to be removed, the purpose of the surgery, the targeted location, and it's up to the patient's own preferences sometimes.

Surgery, in some cases, comes after or followed by other cancer treatments: In the case of cancer that has spread in more than one area of the body or when the cancerous tumor is larger than to be surgically removed. The surgeon may remove as much as possible to ease the job for other treatments like radiation or chemotherapy.

2/ Chemotherapy

Despite its usage in other conditions *like to treat bone marrow diseases and certain immune system disorders*, we only know chemotherapy as a common treatment for cancer.

Chemotherapy uses drugs with cell-killing features to fight off cancer cells in the body. Generally, the drugs are introduced to the body through the process of inserting a tube with a needle into a vein in the chest or the arm. Still, the drugs may also be given in the forms of pills, shots, creams, or even gels to be applied to the skin (*mostly for certain types of skin cancer*). Sometimes, chemotherapy can also be given to the cancer site after surgery, or it may be injected directly into the veins that feed the cancerous tumor.³³⁰

Chemotherapy is never the preferable treatment due to its common side effects, ranging from short-term disorders (nausea, diarrhea & constipation, and full hair loss) to long-lasting side

effects involving heart and kidney problems, infertility, nerve damage, and risk of second cancer.³³⁰

3/ Radiotherapy

Radiotherapy is a therapy that uses ionizing radiation as a part of treatment. It is generally used to cure cancer as a primary treatment, relieve the symptoms, or make other treatments more effective when combined with (*like the combination with chemotherapy*). It can also be a part of a pre-surgery treatment to shrink a cancerous tumor or a part of a post-surgery treatment for stopping the growth of any remaining cancer cells.

Radiotherapy (*which is ranked after surgery and chemotherapy in terms of effectiveness*) involves radioactive liquid to be swallowed or injected into the blood, a painless external treatment, where a machine carefully sheds beams of radiation at the cancer or an internal treatment where small pieces of radioactive metal are placed near the cancer location.

Again, radiotherapy is not a side-effect-free treatment. *Local skin irritation, local hair loss, changes in the way food tastes, a sore mouth, fatigue, nausea, vomiting, and diarrhea* are all post-therapy changes the patient is likely to experience. Still, most can be treated and overcome with some drugs given to the patient after the treatment, such as anti-sickness drugs, while most will go away on their own by the end of the treatment. Second cancer development is also a potential hazard in very rare cases.³³¹

Clarifying when the therapy is needed, Dr. Michael Williams, *consultant clinical oncologist at Addenbrooke's Hospital in Cambridge*, explains: "*Whether or not radiotherapy is given in combination would depend on the disease being treated. For some*

*cancer, such as head and neck cancer; it can be the only treatment and then replaces surgery. For other diseases, such as breast cancer, it's used in combination with surgery so that the main lump is removed by surgery and then radiotherapy follows. And other diseases which are sensitive to chemotherapy, such as lymphoma, chemotherapy is given first and then radiotherapy is used to consolidate at the end.*³³²

4/ Hormonal Therapy

Some types of cancer depend on hormones to grow in the body. These are called hormone-sensitive or hormone-dependent cancers. Those can be treated using medicines to decrease hormones in the body or prevent the hormones from making cancer cells. Hormone-sensitive cancers may include breast cancer, prostate cancer, ovarian cancer, and womb cancer.

Hormone therapy aims to prevent beaten cancer from coming back or reduce the size of a tumor before surgery. For more effectiveness and a better response from the body, hormone therapy can also be combined with another cancer treatment known as “targeted therapy” in which specific genes or proteins that contribute to the cancer growth are targeted with drugs. Still, in all cases, hormone therapy may come with its potential common post-treatment risks, involving hot flashes, vaginal discharge, vaginal dryness or irritation, fatigue, nausea, joint and muscle pain, and even possible impotence in men.³³³

► Takeaway #25

The mystery of cancer has baffled scientists for centuries. And until this very day, there is no known cure for cancer, only some therapies to ease and manage symptoms in early stages.

A Bright of Hope for the Future

When some predict that deaths from cancer worldwide will continue to rise until reaching 13 million by 2030,³³⁴ the year 2020 has surprisingly carried some hope in this respect.

According to the NCI, new studies in the field discovered a form of a certain type of helpful viruses known as “oncolytic virus” that can be simultaneously used to kill cancer cells and to awaken the immunity by providing the immune cells with a certain hormone they need to perform their own cell-killing function against cancer cells. Researchers promised the idea might be quickly translated to use in patients very shortly.³³⁵

The other thing is AMG 510. More than 30% of human cancers are driven by mutations of the RAS genes.³³⁶ This AMG 510 is an experimental drug supposed to target one of the non-reachable cancer-related proteins called KRAS. By late 2019, AMG 510 was approved to begin phase 2 clinical trials (*which involves evaluating the drug's effectiveness in people with the disease*) and so far, looks so promising.³³⁷

Last but not least, we have the so-called “*abscopal effect*” as a cancer treatment. In order to slow the tumor’s growth in a 67-year-old patient, who was suffering from a rare form of sarcoma

and her body was no longer responding to therapies, doctors at the Washington University School of Medicine in St. Louis used proton beam radiation treatment, not hoping for more than making the lady's life with her cancer a bit comfortable. Surprisingly, just one proton radiation course left a remarkable shrinkage, not only at the irradiated tumor, but the treatment had also shown its positive effect upon the other untargeted tumors in the lady's body. It was a matter of time before all the cancerous tumors miraculously disappeared from the scan, and so did from the body of the 67-year-old woman forever!³³⁸

"Nearly 3 years later, she is alive and doing very well," said Dr. Baumann, whose team recently linked that unexpected improvement in the patient's health to a rare response to treatment known as **the abscopal effect.**³³⁸

"When you treat a single tumor in a patient who experiences the abscopal effect, you're waking up the immune system and enabling it to recognize other tumors in the body," said Billy W. Loo, Jr., M.D., Ph.D., a radiation oncologist at the Stanford Cancer Institute.³³⁸³³⁷

"In response to radiation, tumor cells may release material that is recognized by the immune system as a threat, potentially leading to an immune response throughout the body," explained Silvia Formenti, M.D., of Weill Cornell Medicine, whose research helped to establish a link between the abscopal effect and the immune system.³³⁸

"The irradiated tumor can become a kind of vaccine," added Dr. Formenti. This approach to treating cancer can be carried out in various ways, including radiation therapy.³³⁸

A Genetic Disorder With Many Possible Causes

As far as we know, cancer is a complex group of diseases given rise due to abnormal changes in genes that control cells' growth and division. These genetic changes can be inherited as they can appear at any stage during the lifetime.

In all cases, maintaining a simple active, healthy lifestyle alone decreases the chance of getting cancer by 30%.³³⁹ Other than that, vaccination against the human papillomavirus (HPV) and getting regular screening tests would also make a crucial difference.³³⁹ In addition to all of that, the absolute avoidance of the next listed **carcinogens** should complete your preventive approach against cancer:

1/ Tobacco and Alcohol

*1.5 million people die from cancer linked to tobacco every year.*³³⁹

Smoking can cause cancer almost anywhere in the body due to the harmful chemicals that enter the bloodstream with every smoked cigarette.

A chemical known as “benzo(a)pyrene” is an indirect-acting carcinogen that undergoes two epoxidation reactions to yield a highly reactive electrophilic ultimate carcinogen.³⁴⁰ It is also believed that this latter causes damage, specifically at a certain part of the DNA that normally protects our cells from cancer.

Based on rigorous research, the WHO announced: «*Second-hand tobacco smoke (SHS) has officially been classified as carcinogenic – cancer causing – in humans. It also causes severe acute and chronic heart disease. Other adult conditions linked to*

SHS are bronchitis, pneumonia, asthma, and in children: lower respiratory infections, asthma, middle ear infection, sudden infant death syndrome, and low birthweight for babies of women exposed to SHS during pregnancy. »³⁴¹

Regarding alcohol, still, the advice is not to lose moderation, which is defined as up to 1 drink per day for women and up to 2 drinks per day for men.³⁴² Otherwise, the NCI clearly declares: “Drinking alcohol can increase your risk of cancer of the mouth, throat, esophagus, larynx (voice box), liver, and breast. The more you drink, the higher your risk. The risk of cancer is much higher for those who drink alcohol and also use tobacco.”³⁴²

2/ Radon Gas

Ranked after smoking, radon gas is the 2nd cause of lung cancer, with a terrifying criminal record of over 20,000 related deaths in the United States only.³⁴³

Radon (Rn) is a radioactive, colorless, odorless, and tasteless gas. It occurs naturally in the air and comes from some special rocks or from the dirt in the ground. When the radon gas is inhaled, the radioactive substances can get stuck in the lung. With continuous accumulation, these substances are believed to contribute to the development of lung cancer.³⁴³

To avoid the risk, every home should undergo a radon test. If the test reveals high levels of radon gas, the radon level at home must be lowered to safer levels. The testing can be done simply using the right testing kits. But an expert must perform the reduction process.

3/ Ionizing Radiations

Radiation is a form of energy that has the property of traveling through space and has the ability to penetrate certain materials. Examples of these are visible light and microwaves that cook food.

Regarding their effect on our health, only ionizing radiation has enough energy to damage DNA and cause cancer.³⁴⁴ The other high-energy radiations, such as x-rays, gamma rays, alpha particles, beta particles, and neutrons, have shown some effect on DNA. However, the chances of developing cancer from these types of radiation are very low.

It's also worth mentioning that lower-energy, non-ionizing forms of radiation, such as visible light and cell phone energy, have not been found to cause cancer in people.³⁴⁴

4/ Other Environmental Elements

Infectious agents are involved in up to 20% of human cancers. Certain bacteria, viruses, parasites are associated with increasing the risk of getting cancer. Exactly, by weakening the immune system so it's no longer able to fight off cancer-causing substances. Or more directly, by disrupting the signaling that normally keeps cell growth and proliferation under check. Also, some of these infectious agents can cause chronic inflammation, which is another cancer-causing factor.^{345 346}

Getting vaccinated regularly (*vaccination against HPV and hepatitis B virus in particular*) and avoiding unprotected contacts, such as unprotected sexual intercourse and needle sharing, and more interestingly, earphones sharing are the simple set of preventive actions to be taken in this case.

► Takeaway #26

*After all this long-standing battle against cancer, we're still down to two winning possibilities: 1/ developing better **treatments** based on a deeper understanding of its involving aspects, or 2/ lowering the number of cancer cases by encouraging the public to embrace an anti-cancer lifestyle. That simply means to **stick to the highly healthy lifestyle** that you outline according to the given facts and recommendations from previous chapters, steer clear of the list of **carcinogens** mentioned earlier, and NEVER neglect **getting screening tests** on a regular basis.*

Digestive Disorders

The gastrointestinal tract, with its different parts (*the mouth, the esophagus, stomach, small intestine, large intestine (colon), and rectum*), serves as a nutrients extraction machine that extracts the necessary amino acids, fatty acids, and sugar from proteins, fats, and carbohydrates. Meanwhile, it dumps the waste out of the body in the form of stool and urine.

Once the machine experiences some internal damage, it starts sending malfunction alarms in the form of **digestive disorders**.

1ST DISORDER: CONSTIPATION

“Constipation” is described as the condition when having infrequent, difficult, or incomplete bowel movements. Practically, constipation is defined precisely as having less than three stools a week of hard and dry form that strains the bowel movements. The abnormal bowel movement can also be accompanied by other unpleasant symptoms, such as discomfort in the bathroom and abdominal bloating and pain due to the hard and dry stool.

Constipation is mainly a hydration-related condition, where if the body is not hydrated enough, water will be sucked from the colon, causing it to dry out. Even fiber nutrients that significantly contribute to the intestines' health do so by

allowing more water to remain in the stool to ensure a smooth and easy passage through.

Work Out the Colon

Like any other body organ, the colon is badly affected by inactivity. Exercising helps stimulate the natural contraction of muscles in the intestines, resulting in a great increase in bowel movement and better muscle squeezing in the area.

Exercise also ensures better digestion as it decreases the amount of the absorbed water from the stool by lowering the time it takes food to move through the large intestine, which would keep the stool wet enough for a smooth passage.

A 30-minute aerobic exercise like biking and jogging is just good for the bowel. Yet, stretching abdominal muscles with abs exercises should be associated with more significant results, for it creates direct stimulation for the intestinal muscle in a more focused way.

Why Should We Worry About Constipation in the First Place?

First, passing hard stool imposes great pressure on the channel, potentially resulting in anal fissures when the pressure tears the tissue around the anus, causing local pain, itching, and bleeding. It may also severely affect the colon itself and threaten the whole GI health in the long term, given that constipation is the culprit of several GI problems, such as Celiac disease, Diverticulitis, and Hemorrhoids. Also, when constipation lasts for several weeks, the condition is evaluated and treated as a chronic disorder, where dietary supplements and even surgery might be inevitable.

It is also worth mentioning that laxatives that are often recommended as dietary supplements for helping the colon and increasing bowel movements are not always safe, for they are associated with dependency and decreasing bowel function. Other side effects vary from one type to another, as it is the case with the following few examples according to Mayo Clinic³⁴⁷:

Type of laxative (brand examples)	How they work	Side effects
Oral osmotics (Phillips' milk of Magnesia, Miralax)	Draw water into the colon to allow easier passage of stool	Bloating, cramping, diarrhea, nausea, gas, increased thirst.
Oral bulk formers (Benefiber, Citrucel, FiberCon, Metamucil)	Absorb water to form soft, bulky stool, prompting normal contraction of intestinal muscles.	Bloating, gas, cramping or increased constipation if not taken with enough water
Oral stool softeners (Colace, Surfak)	Add moisture to stool to allow strain-free bowel movements.	Electrolyte imbalance with prolonged use
Oral Stimulants (Dulcolax, Senokot)	Trigger rhythmic contractions of intestinal muscles to eliminate stool	Belching, cramping, diarrhea, nausea, urine discoloration with senna and cascara derivatives

Rectal suppositories (Dulcolax, Pedia-Lax)	Trigger rhythmic contractions of intestinal muscles and soften stool.	Rectal irritation, diarrhea, cramping
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► ***Takeaway #27***

Constipation is an easy-to-get condition that can lead to serious complications. For prevention and cure, consider maintaining your outlined healthy diet according to the given recommendations from Part I, and practice abdominal exercises regularly to keep the colon and the intestines healthily active.

2ND DISORDER: HEARTBURN AND ACID REFLUX

Unlike what its name might refer to, **heartburn** does not affect the heart. It is a symptom caused by stomach acids traveling up towards the throat in the chest.³⁴⁸ This disorder is called “**Acid Reflux**,” and it results in a sour or bitter taste in the throat and mouth along with a painful burn feeling in the middle and the lower part of the chest as the main symptom. It may be accompanied by cough, as it might lead to hard breathing, vomiting, and bloating as well. These symptoms will probably be worse after eating, when lying down and when bending over.

Here Is the Case:

The food we eat passes through a 10-inch long esophagus. At the bottom, there is an opening, much like a gate that separates the esophagus from the stomach. This opening closes as soon as food passes through to keep stomach acids from coming back up. But if it does not close all the way, acid from the stomach can get through the opening and into the esophagus, giving rise to the so-called “Acid Reflux” and its consequent symptoms.³⁴⁹

People with acid reflux are required to follow some lifestyle restrictions. They never have to go to bed with a full stomach. They cannot lay down unless —*at least*— 2 hours after the meal, as they have to avoid overeating in all cases. Also, they must avoid any exposure to heartburn triggers, including tomatoes, peppermint and onions, chocolate, high-fat and spicy foods, beverages with caffeine, and citrus fruits or juices.

For Life?

Once first diagnosed, the doctor may recommend adopting these latter lifestyle changes along with over-the-counter medications that may include antacids that neutralize stomach acid, medications to reduce acid production, or medications to block acid production and heal the esophagus.

The condition should be relieved within a few weeks. Otherwise, it will be evaluated (and treated) as gastroesophageal reflux disease (GERD), where treatments may involve:

- Prescription-strength H-2-receptor blockers, where the long-term use may slightly increase the risk of vitamin B-12 deficiency and bone fractures.
- Prescription-strength proton pump inhibitors, which may cause diarrhea, headache, nausea, and vitamin B-12 deficiency, and long-term use may increase the risk of hip fracture.
- Medication to strengthen the lower esophageal sphincter with fewer side effects that include fatigue or nausea.³⁵⁰

The other option is undergoing surgery, where the patient has to choose between **fundoplication** and **LINX device**.

In **fundoplication**, the top of the stomach around the lower esophageal sphincter is wrapped in order to tighten the muscle and prevent reflux.³⁵⁰

The alternative is the **LINX** procedure, where a ring-like device is wrapped around the junction of the stomach and esophagus. It is made and placed in a way that allows food to pass but still prevents the acid from coming back up.³⁵⁰

Can't It Be Prevented in the First Place?

There is no evidence showing any direct association of any involving factor that may lead to such functional failure. However, the condition « may develop if your lower esophageal sphincter becomes weak or relaxes when it shouldn't, » according to the NIDDK.³⁵¹ Meaning that we can prevent acid reflux by keeping an eye on the factors that may affect the lower esophageal sphincter, including:

- The increased pressure on the abdomen from being **overweight** or during **pregnancy**.
- **Smoking** or inhaling second-hand smoke.
- **Alcohol** excessive consumption.
- **Stress** and **anxiety**, as well as some **medications**, such as anti-inflammatory painkillers (like ibuprofen).³⁵¹

In avoiding those, you have already developed the necessary knowledge from chapter 05 on managing **stressful** situations to minimize their lasting effects on the body. The active lifestyle supported with a healthy diet will gradually burn the **extra weight** and prevent its bad impact upon overall health. **Alcohol** intake is to be decreased down to safer levels, and **smoking** is to be quitted altogether. If you think it is not that easy to quit, Chapter 07 will change your perspective on every bad habit you have tried but failed to break to date.

This way, our list of factors that may threaten the lower esophageal sphincter boils down to one single yet mostly unavoidable potential threat—that is **pregnancy**.

How to Prevent Acid Reflux During Pregnancy?

Although the single factor alone should not usually give rise to a whole condition, the pregnant lady, who is at greater risk of developing acid reflux, may want to follow some simple restrictions if needed during the third trimester of pregnancy ***under medical supervision*** in order to avoid the accumulation of the potential causing factors and stimulants.

Starting with the meals, smaller but more often meals should be better than a few large ones. Caffeine, chocolate, spicy foods, citrus fruits or juices, and beverages (especially carbonated) are better reduced. Interestingly, chewing sugarless gum after each meal can be very helpful as it stimulates the production of saliva, which consequently smooths the esophagus and neutralizes acid in the stomach.³⁵²

► Takeaway #28

Unless it becomes chronic, heartburn (acid reflux) is not a severe condition that should cause worry, and it does not give rise to further complications, but it still may make one's life uncomfortable, especially with all the imposed lifestyle restrictions.

The good news is that a physically fit individual, who knows how to manage stress and anxiety, does not take any medications, and does not smoke or drink alcohol excessively, should NEVER be likely to experience such a condition.

Just in the case of being overweight or during the third trimester of pregnancy, one is better off

avoiding food that triggers acid reflux to prevent the accumulation of causing factors.

3RD DISORDER: GALLSTONES AND THE OTHER STONES

The gallbladder is this pear-like pouch found on the underside where the bile is stored. The liver produces and secretes bile as an essential part of the absorption of fat-soluble substances like vitamins and as the route of excretion for some cellular byproducts. Except for storing this digestive fluid, the gallbladder itself has no essential job in the body. However, it attracts our attention when hard deposits form solid stones within the pouch resulting in what is medically known as “cholelithiasis” disease.

Gallstones range from grain-sized to the size of a golf ball. The stone is made of cholesterol or another substance formed as a result of the normal breakdown of red blood cells known as “bilirubin”.³⁵³ When the stones block the bile ducts (openings inside the gallbladder), they cause sudden pain that may last from an hour to five. The pain may be experienced in the center of the abdomen or the upper right portion of the abdomen, almost where the gallbladder sits inside. Back pain and pain in the right shoulder might be included, along with potential nausea or vomiting.³⁵³

Treatment and Surgery

Gallstones require treatment only when pain exists, which represents the only main symptom of the condition. Generally, there is only surgery as a treatment for cholelithiasis, but different from the traditional open surgery, the surgery known as “cholecystectomy” involves but four small incisions to insert

special surgical tools and a tiny video camera to look inside. Cholecystectomy comes with less post-surgery pain and less risk of complications. Generally, the patient is allowed out of the hospital the same day of the surgery.³⁵⁴

Orally-taken medicines that help dissolve gallstones DO exist. Yet, they are not commonly used for their lack of effectiveness. The expected results may take months or even years of continued treatment (and pain!). And gallstones may form once again in the place after treatment stops.

What Causes the Condition?

What is clear so far is that the imbalances in cholesterol and/or bilirubin lead to the formation of stones. The bile usually contains enough chemicals to dissolve cholesterol and bilirubin excreted by the liver, so the condition develops when cholesterol and bilirubin outweigh the bile salts in the gallbladder. The main reason that causes these imbalances is still unknown, but as the rise of the condition has something to do with cholesterol, some believe it may be associated with high-fat and high-cholesterol diets.³⁵⁵

Gallstones vs. Kidney Stones

Gallstones and kidney stones are both common types of stones found in the body that require no treatment and cause no pain unless they block the fluids' flow in their respective channels.³⁵⁶

Gallstones form within the digestive tract and cause a blockage in the bile ducts and hurt in the right mid-upper abdomen, while kidney stones block the flow of urine and result in sharp pain in the lower back or side of the body.³⁵⁶

“Nephrolithiasis” (the medical term for kidney stones) is linked to a diet that is high in **sodium, oxalates, or animal protein** and insufficient intake of **fluids or calcium**. Besides the local pain, kidney stones may be accompanied by blood in the urine and painful urination, along with nausea and vomiting.³⁵⁶

While cholelithiasis is treated through the surgical removal of the gallbladder, most kidney stones do not require invasive treatment. They may be pushed to pass by drinking plenty of water or with some types of medications like those known as “alpha-blockers.”³⁵⁶

Pain relievers might be prescribed to relieve the pain and discomfort caused during the passage of the stones. However, in the case of larger stones that cannot be managed this way, they may be broken up using high sound waves as they may even be surgically removed.³⁵⁶

Stones Can Form Elsewhere in the Body

Prostate and salivary gland, bladder, pancreas, and veins are other body parts where stones may occur other than the gallbladder and kidneys.³⁵⁷ Although they exist, people with stable health and who do not undergo medical treatments with side effects are not likely to experience such rare conditions.

Food Allergies and Intolerances

Food allergy is an abnormal response to certain foods or nutrients triggered by the immune system, which mistakenly considers that particular food or nutrient the body is sensitive to as an invading substance and deals with it accordingly.

Any food within the human diet can cause allergic reactions in people with food allergies. Yet, the following eight foods, in particular, account for 90% of food allergic reactions worldwide.³⁵⁸ The list covers all of:

- Milk,
- Eggs,
- Fish,
- Shellfish,
- Tree nuts,
- Peanuts,
- Wheat, and
- Soy.

If someone with a food allergy eats or even *–in some cases–* gets exposed to one of those foods, syndromes take place such as swelling of the tongue, vomiting, diarrhea, stomach cramps, repetitive cough, tightening of the throat, and trouble breathing, along with the pale or blue coloring of the skin. All as a result of an abnormal immune reaction.³⁵⁸

Health care providers may use a detailed history, elimination diet, and skin and blood tests to diagnose food allergies. People with a food allergy must be prepared to deal with accidental exposures. They always have to carry an auto-injector device containing epinephrine (adrenaline) and wear a medical alert bracelet or necklace.³⁵⁹

Food Allergy vs. Food Intolerance

The fact that both come with the same signs and symptoms and that the two represent physical reactions to certain foods may have made many think of food allergy and food intolerance as two different names of the same condition. Yet, they are not: While food allergy triggers abnormal immune reactions that can be very life-threatening, food intolerance usually comes with less serious symptoms that are often limited to digestive problems.³⁶⁰

People with lactose intolerance, for example, face symptoms like diarrhea, gas, and bloating after consuming milk or dairy products. Not as a result of an immune reaction, but due to the absence of enough lactase, an enzyme responsible for digesting milk sugar (lactose) in the body.³⁶¹

An individual with lactose **intolerance** may either avoid lactose consumption (e.g., looking for lactose-free milk) or take lactase enzyme pills (Lactaid) that target and break down lactose in the body. However, someone with a **food allergy** has but the total avoidance of allergens as an option.³⁶¹

A Fatal Recommendation !

In the case of allergies, the reaction and its symptoms are avoided *in people with food allergy* through the absolute elimination of allergens. Yet, this can never work as prevention for ordinary healthy individuals. In an effort to stop the spread of food allergies among children in the United States by the late 90s, the American Academy of Paediatrics recommended a delayed introduction of highly allergenic foods in high-risk infants to prevent the development of allergy as following: Cow's milk

until age 1 year; eggs until age 2 years, peanuts, tree nuts, and fish until age 3 years.³⁶²

Unfortunately—worse to say—miserably, what was intended to be part of a preventive approach against food allergy turned out, however, to be the single mistake that would cause more American children to suffer a tough childhood with the disease throughout the next few years. A study cited by the Centers for Disease Control and Prevention (CDC) showed an 18% increase in food allergies in children between 1997 and 2007, while another one released in 2013 cited a 50% increase as of 2011!³⁶³

During those years of helpless bewilderment in the face of the mounting numbers, very few to no cases of food allergy have been recorded in the middle east, where no recommendation akin to the AAP's was paid heed to. It was as if the families in the middle east were unknowingly providing their children with an auto-protection against food allergy by exposing them to allergens at very early ages. This theory was supported by Dr. Gideon Lack—*Professor of Paediatric Allergy at King's College London*, and his team, whose field investigation concluded that having the body used to these foods at younger ages significantly decreases the risk of peanut allergy, proving the AAP recommendation counterproductive.³⁶⁴

In 2017, and after nearly two decades from the AAP first recommendation, guidelines have been developed to encourage the early introduction of peanut-containing foods into infants' diets at various risk levels for peanut allergy.³⁶⁵ At that time, the AAP had already admitted their mistake through an article published in 2013 titled: "Early introduction of allergenic foods may prevent food allergy in children."³⁶⁶

True Prevention Starts During Breastfeeding

Breastfeeding is much more than a good way for the mother to burn extra calories and lose pregnancy weight. Breast milk provides the necessary protection against different sicknesses as it contains antibodies that help the baby's delicate body fight off viruses, bacteria, and other harm-causing substances.

Babies *who are breastfed exclusively for the first six months without any formula* have fewer ear infections, and they are less likely to experience constipation, diarrhea, and early obesity, given that breast milk is easily digested and supplies all the necessary nutrients in the right proportions. Even some research declares that breastfed babies score higher on IQ tests in association with a higher cognitive level, at least in males.³⁶⁷

Furthermore, breast milk can provide the child with sustainable prevention against food allergies. In that respect, every mother's diet before, during, and after pregnancy must be as varied as possible. It should cover all different types of nutrients, vitamins, and minerals. Even more interestingly, it should include highly allergenic foods (*eggs, milk, wheat, fish, shellfish, peanuts, and tree nuts*) so their components will be introduced to the body of the newborn baby through her breastmilk and will not have a problem dealing with them later.

► Takeaway #29

There are two kinds of patients in the world: a patient who just sits back to be a ‘patient’ and a patient who is proactive.

Proactive patients take their illness seriously and know to put their needs at the top of their priority list.

Proactive patients learn about their medical case and try to talk with people who have suffered from the same disease to seek information even before asking the doctor’s advice.

Proactive patients engross themselves in information about their medical case all the time for the treatment, think twice about the doctor’s diagnosis and suggestions, and take a right to agree or disagree, or even to request a second opinion, which means to follow up the treatment under another doctor’s supervision.

Chapter 05 is a preventive approach in the first place. Side facts and information concerning treatments available for each medical case, types of surgeries, prescribed medications, and their potential side effects were discussed, however, only for the sake of encouraging individual ‘proactivity.’

Catch the midline #2: Between Raising Health Awareness and Stimulating Fear of Ill-Health

A warning label with a list of potential side effects is attached to every pharmaceutical drug for the public to consider, and so should be the case here.

PART II, with its two involving chapters, was nothing short of a highly potent health-promoting prescription in the form of a readable product. At the side-effects level, we have fear of ill-health and its one consequent symptom: illness anxiety disorder, formerly known as “hypochondriasis.”

The seed of fear of illness lives in every human mind. Giving insight into some ugly medical facts and raising caution for potential health threats, even for educational purposes, often stimulates this seed to germinate and grow wild. And if it does, nothing that comes in bottles can affect a cure.

The key to catching the midline here is so simple: just NEVER adopt a defensive position, whatever the case is, and no matter how bad the circumstances are. Do not chase success with the fear of failure. Do not just lock yourself within this sanctuary —*that we call a healthy lifestyle*— because you fear the fatal fate outside its outlined borders. Do it, however, so you can rebuild your new self that is strong enough to face threats, and so this reinforced concrete of your body will be soon serving as your

well-sheltered self-sanctuary. Let your body go (and grow) through this process, with all fearlessness and confidence, and soon it will repay you with all satisfaction.

And if one day —far be it— the medical report happens to carry some bad news, it is, then, the time when you have to go on with your life and start doubting everything related to that: doubt the doctor, the machines, the hospital, the results of the medical report; doubt science, doubt medicine. Lose your faith in everything except yourself! Do all you can to take yourself out of the negative atmosphere formed due to the disease into a positive one. Get yourself tied up with different businesses and life activities all day, for that sake. Check out some real 'survival and hope' stories from time to time, and if you happen to feel like quitting, just remember the cases in those stories where the toughest of odds backed by science and medicine were defeated by an ordinary human being just like you!

Be it a prayer to a mighty God, be it a life gift, or—if not—your own determination to live for yourself and your family. There always must be one last option when they say it's over.

PART III

THE SIMPLE SCIENCE OF SUSTAINING HEALTH- PROMOTING CHANGES

With Part One shedding light on the main aspects of healthy eating, and Part Two giving insight into the major body systems—*suggesting all-natural ways to improve the capacity of each and prevent health- and life-threatening diseases*—the preceding six chapters have just laid out a complete guide to ultimate physical health and wellness.

Now, making the best use of this wide array of information to change your lifestyle accordingly is the next challenge. Psychologically speaking, our very nature as human beings tends to resist any change we may intend to impose during our lifetime unless we manage to have the changing process strategically matched to our instinctive nature.

PREREQUISITE #4

The Kaizen Way of Making Long-Lasting Changes Using very small moments to inspire new products and inventions.”³⁶⁸

“Kaizen is an ancient philosophy captured in this powerful statement from the Tao Te Ching: “The journey of a thousand miles begins with a single step.” Though it is rooted in ancient philosophy, it is just as practical and effective when applied to our hectic modern lives.

Kaizen has two definitions:

- Using very small steps to improve a habit, a process, or product.
- The next closing chapter is, therefore, to reveal HOW.

CHAPTER

7

How to Make Lifestyle Changes *That Last*

In one recent study, a number of volunteers have undergone an educational program where they have been taught all the beneficial aspects of eating five fruits and vegetables each day. The evaluation revealed that the program was so effective in emphasizing the importance of having five daily servings of fruits and vegetables for the individual. However, the final results showed that only 11% of these people have successfully managed to meet this simple goal on a daily basis for the time of the study!³⁶⁹

No matter how surprising they might sound, such study results actually do but interpret a classical cognitive issue into an accurate language of data; All for the sake of drawing attention to a major area of investigation that has been neglected in favor of other less or equally important ones. Otherwise, how come we just harness that much time and effort to provide life-changing guidelines that will not eventually find a way into sustainable application!?

Determined to find science-based explanations to tie up this loose end, we had to go over all the available literature concerning the brain functionality and its inescapable effects upon our decision-making process, where different interactions of researchers in several intellectual domains—*including animal learning, cognitive psychology, cognitive neuropsychology, and behavioral neuroscience*—have been checked out for answers. Eventually, the results of all research and analyses have come to conclude that we, as human beings, have far less control over our actions and behaviors than it has ever seemed to be.

All animals were known to be guided by their incommutable instinct. Humankind, however, was believed to be exempt owing to his unique ability of “reasonable thinking.” Still, the array of habits that make up the effective elements of the human instinct would irresistibly handicap any changing process that we may be guided (*by our “reasonable thinking”*) to go through during our lifetime.

Now, many people may be perfectly aware of the cost of living with a particularly bad habit (*e.g., the habit of smoking tobacco*). They may not like their life with it either. Still, that doesn’t help them quit it all the way. That is because the habit is a vast, hugely powerful force that no reason for change can withstand in the long term. Rather than standing against this mighty power that has all the odds overwhelmingly in its own favor, we can make better use of our *reasonable thinking* to enlist this great power of habit in our cause and make the inevitable work for us instead of against us, which we can’t achieve unless we manage to have the changing process *in some ways* matched to the mechanism of our cognitive system.

The Only Change That Proved Sustainable

As much as the countless number of tasks, actions, and reactions *that the brain has to control throughout the hours of the day* might seem so much to handle for a single delicate organ, *which utilizes no more than 20% of the total energy reserve*, we don't feel as we are putting any mental effort when performing our routine tasks. We may not even notice that the brain is involved to any extent when hanging out in town or driving back home from work, no matter how long the process of walking/driving might take. However, performing the same type of activity (walking or driving), for the same or less duration of time, under the same mental and physical conditions; yet, in a new town *where trying to move from and to unfamiliar places* requires a higher level of attention, resulting in a noticeable drop of energy, at both levels, mentally and physically!

If we want to execute some simple neuro-psychological analyses in order to understand and explain this mysterious incident *where the same task calls for different energy requirements in two different places*, the results will plainly show that not all daily tasks and actions are processed in the same region of the brain.³⁷⁰ Instead, as far as we know, the human brain stores some ready-to-use acts into very accessible places as a part of a genius energy-saving strategy. Therefore, from a neuropsychological perspective, we could conclude that the brain classifies any action we intend to perform at any given

moment into one of two different types of actions and manages it accordingly:³⁷¹

1. Goal-Directed Actions. This term refers to the mental and physical activities controlled by the conscious part of the brain. It can be exemplified by an outsider trying to find a particular place in a new (unfamiliar) territory. Such activities are great **energy** consumers and require full attention as well as a certain level of **willpower** (*which is, in that example, generated by the fear of getting lost in a foreign city*).

2. Habitual Actions. Like finding your way into the bathroom on autopilot to brush teeth after finishing a regular meal. Different from the first ones, habitual activities are carried out within another part of the brain (*which, to avoid complex names, we will be referring to simply as the “subactive brain”*).

Clearly, the **habitual** action requires the least amount of energy, with almost no attention required and with no willpower involved at all. It can be performed adequately under an auto-pilot mode.

Now, if we want to evaluate both of the known mental activities in terms of **sustainability** based on all the happenings that were found to take place behind the scenes, the '**habitual action**' will be our indisputable picked –no question about it– simply because this one represents a self-directed action that is deeply rooted in the brain within a regular automated process, which serves as a helpful force that is always active under whatever circumstances. On the other hand, the '**goal-directed task**' is always inseparably related to two external factors: **energy**

and **willpower**. And needless to say, none of these two can maintain steady levels in the process. Energy level (*which depends on the current physical status*) is so likely to be missed at the end of a working day or by the end of a hectic week. At the same time, willpower always requires being motivated and in the best emotional conditions, or you're doomed to laziness and lethargic inactivity as your actions will be lacking the necessary thrust.

Starting a new lifestyle involves embracing new actions and new behaviors. Therefore, the only known way to ensure secured **sustainability** for any new lifestyle is to get to introduce each of its involving actions and behaviors as a firmly rooted HABIT that is carried out by the least energy-consuming part of the brain so it will never relate to any external factor to any extent whatsoever.

Please, don't be deceived by having the initial conditions to your own advantage at the very beginning. No matter how the index of **energy** and **willpower** may appear so promising on day one, the two factors are always likely to collapse at any point in time, leaving the new task at stake, and so the whole changing process.

Now, in accordance with that, if you decide to follow the classical changing process that leans on willpower, it will take you one single moment of fatigue or distress before you give up your new targeted (healthy) behaviors and fall back on your old bad habits once again. In all cases, there is no substitute for cultivating each of your targeted behaviors and actions as a set of deeply-rooted HABITS following the next 3-step changing process. It might take you twice or thrice longer. But the change is 100% guaranteed, and it will last for life.

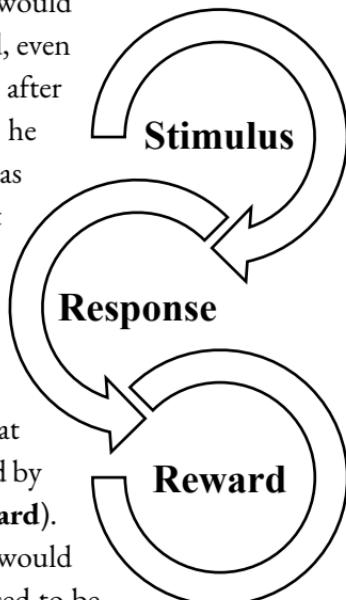
► **Takeaway #30**

*Relying on **willpower**, you could embrace any lifestyle change you believe would make a difference in your overall health, but only can you maintain it in the long run if you manage to establish each of its new involving behaviors as an auto-active **HABIT** that tends to occur smoothly and effortlessly in the given moment with little to no resistance in the process.*

Step 01: Understand the Major Habit-Making Components

Many have tried to give an intelligible understanding of human habits in order to help us gain more control over their impact, or even over their existence as a part of our lifestyle in the first place. But it was not until the beginning of the last century when the investigation process took a sensible course, thanks to Russian physiologist Ivan Pavlov, who explained the habit as “a subordinate **Response** to an existing **Stimulus**.^{”372}

Pavlov made his first observation on his dog; Although dogs naturally produce saliva only as a part of the digestion process, he noticed that his dog would salivate when he saw or smelled food, even before he tasted it. Therefrom, and after further experimental research, he concluded that the habit, in animals as well as in human beings, does not stand alone, but it represents a subordination-based relationship between two different elements: the **Stimulus** and its stimulated **Response**. Later on, it appeared that the **Response** itself must be followed by a completing component (a **Reward**). Because, to put it simply, this dog would have never salivated if he had not used to be rewarded with the taste of that food eventually.



This way, the habit is dynamically broken into its three leading components related together in terms of implication to form what I prefer to call “the habit chain.”

I know “the habit loop” is the term that has been used in referring to the same notion. Well, it still gives the same helpful perspective that we need to control our habits. However, and just, strictly speaking, the relation between the three factors that make up the habit seems to run within an open one-way process rather than to occur within a full closed circle to be called a “loop.” And although the **Reward** plays a major role in keeping the habit alive as it will be further emphasized, it still does not directly impact the **Stimulus** once the action is finished. Therefore, from a logical standpoint, we can't talk of another

implication-based relationship between the **Reward** and **Stimulus** that would start the habit process once again, as the idea of the “habit loop” indicates.

Step 02: Cultivate the New Healthy Habits Accordingly

Habits make up almost half of people's daily activities, meaning that the process of introducing or cultivating a new habit is not new to our system. It is something we always used to undergo within the absolute presence of the given '**S-R-R**' formula.

Take, for instance, the daily habit of brushing teeth after each meal that is **Stimulated** by the bad breath and discomfort in the mouth, and **Rewarded** by a pleasant smell and a sort of satisfaction and relaxation in the mouth consequently. For most of us, it was something that we learned at a very early age as part of self-cleaning education. Up to this day, it is still deeply rooted as an unbreakable habit that we can never miss or forget, even on our most hectic days.

Following precisely the same formula, we can promote any behavioral action to start serving as a well-ingrained HABIT whose process is carried out by the right (least energy-consuming) part of the brain. Doing so is no harder than establishing such a habit chain where the target action falls as a **Response** to a particular **Stimulus** and is followed by a related **Reward**.

Suppose you aim, for example, to build such a powerful habit of daily workout that will be performed effortlessly under any given condition and never be related to any physical or emotional circumstances. In that case, you may start making the connections as follows:

1/ The Stimulus

First, we are required to build a link between the target action and certain special body status to be the triggering signal—something like *the post-meal discomfort in the mouth that would drive you to brush your teeth, or the state of emptiness that would make someone light a cigarette or the state of overexcitement that mostly leads to overdrinking eventually.*

In the beginning, it might take time and patience to connect the **Response** to such an ever-lasting **Stimulus** that is related to a particular body status. Still, you may at first take refuge on an external stimulus that you can create yourself. For instance, it may help to put your clean and ready-to-wear sport suit somewhere you can see when you are back from work by the end of the day, as an effective initial **Stimulus** to start the habit chain, at least, until you have finally secured the 'go and workout' **Response** with a more stable, self-related stimulus: something like *physical soreness or mild mental depression* after a whole day at work; a state of discomfort, which by the time will have no cure but to go and exercise!

2/ The Reward

Although it is as simple as a post-**Response** self-enjoyment, many people mistake the **Reward** as part of the habit chain for the common reward that is given or received in recognition of a certain achievement or a well-done service. We often hear about such recommendations as rewarding oneself each time after exercising with a piece of chocolate or some sort of a tangible reward.

Well, first, if you tried it yourself or if you encountered someone who did, you would know it makes no difference neither in the short- nor in the long-term outcome. Worse still,

such an external dependency will impose additional pressure in the process, for it adds another task to the brain, another requirement to be considered. Each time you feel like exercising, you still need to do the necessary thinking concerning the proper reward alongside, which is entirely the opposite of what the *effortless* and *auto-active* habit is all about.

Instead, the **Reward** here is all about taking full advantage of the body's self-response to the new action. Just sit back and appreciate every ounce of after-activity self-satisfaction: Instead of coming back home in a **hurry** every time after a workout, taking a **quick** shower, put on clothes, and **rush** into your next thing on your daily schedule as if that were your last day on earth, do it, instead, most slowly and smoothly with your conscious brain (almost) fully shut down. Turn it off for a moment and let the system create the necessary connection between the **Response** and its **Reward** while you take pleasure in the sensation of every single drop of hot water washing over your sweaty skin. Then, gently dry yourself and take a couple of minutes to lie down in a quiet place, where you can live that short moment of self-relaxation and self-relief to the fullest. The body system will never forget such rewards, and soon it will urge you to start that process (of working out) again and again until it is eventually built up as a strong and deeply ingrained habit that you can't live without.

► ***Takeaway #31***

Needless to say, we discussed the build-up of the habit of exercising only as a way of illustration. And we picked precisely that example for being an essential part of a healthy lifestyle that many people struggle to

*keep up with on a SUSTAINABLE basis. Other than that, practically every single behavior that would make the necessary difference in overall health can be built as a self-directed habit simply by, **first**, finding (or creating) a fixed **Stimulus** and, **second**, by giving the body a chance to enjoy its **Reward** posterior to the activity.*

Step 03: Give Up the Old Habits Accordingly

Something about the habit works both ways, negatively and positively—it is the fact that it is so damn POWERFUL. Mr. Jim Rohn once said: “Once habits are formed, they act like a giant cable. They act like a nearly unbreakable instinct.”⁸⁷³ Such power of resistance would make it even harder to give up an old habit than to form a new one from scratch. It may require—in this case—another level of patience and persistence in the process. However, the endeavor (and the outcome) will not be so different when getting to approach the habit from the given S-R-R principle.

Instead of the classical dealing with the habit as one whole matter to be destroyed all at once (which is so likely to fail), think of it as a three-components chain strapped on a sequent basis, where eliminating or applying certain changes upon ***one single component*** would automatically bring the entire chain to collapse, and so the whole habit wears off consequently.

On that basis, and considering the **Stimulus** is the strongest piece in the chain (*for it mostly represents a regular physical or emotional status, or a social situation that is hard to avoid*), more wisely, you will want to operate on the **Response** or the **Reward** to achieve your chain-braking goal.

1st Option: Operating on the Reward

The Middle East records one of the highest rates of breastfeeding, where babies get used to their mothers' breast milk

from day one and carry on with it for the next 6 to 22 months. By the weaning time, the baby becomes so addicted to his mother's breast, making it so challenging to get the baby to wean off it, even in the presence of more satisfying alternatives. Still, it has gotten my attention how some Middle Eastern families manage the situation wisely and smoothly.

Whenever the baby cries for her breast, the mother uses a henna-like substance around her nipple so its bitter taste and the stinking smell would disgust the baby every time he approaches to suckle. The baby might try again for a second and a third attempt, but with the same disgusting **Reward**, the baby would eventually submit to the ugly truth. It is just a matter of time before he forgets about his first source of life forever.

This way, and without having any idea about the theoretical dimension of their effective strategy, these families have given us a great example of how to 'operate on the **Reward**' when trying to break an old habit. In all cases, we can always do the same to manipulate the brain by applying such repellent changes upon the **Reward** and hope for precisely the same results.

I have myself experienced the effects of a disgusting **Reward** in my life, exactly upon my own food preferences. While most of the world is addicted to the creamy and crumbly taste of cakes, it is now the last thing that would get my mouth filled with saliva, just because I happened to try one cake or two in the past that was somehow too buttery that it made me feel nauseous and want to vomit in the place. Even though I am fully aware (*with my 'reasonable thinking'*) that this was an exceptionally bad one, and that was not what cakes usually taste like, up to this day, I can't seem to put up with it. My brain had

already made the connection between that food and its bitter **Reward** a long time ago.

Surprisingly enough, some suggest such a link of connection can even be established in the brain by merely changing the way you think about that Reward. Psychotherapists, like Dr. Mike Dow, claim that they can help people kick some of their bad habits by tapping into their subconscious to create an unpleasant **Reward**. In one TV show, Dr. Mike Dow said he had managed to help a sugar-addicted woman get rid of her addiction using a technique that relates eating sugar to a nauseous feeling. He said the first time she ate sugar after that, she actually vomited!

It all goes down to this: The brain has the ability to remember what the **Reward** tastes like. You only have to make good use of this fact in order to shake the three connected pieces in the chain of any bad habit that you want to give up.

2nd Option: Operating on the Response

It takes but a single one of the three habit-making components (*the Stimulus, the Response, or the Reward*) to wear off for the whole habit chain to collapse all the way. You may center your strategy around the eradication of any of those components and expect the same outcome. If you asked for my personal opinion, I would go with the first option (*Work on the Reward*) to secure a long-term victory, for it is as simple and effortless to proceed as effective at the outcome level. Still, people go with different preferences. And some did find their way out of their bad habits through 'Operating on the **Response**' and have come up with some creative strategies in that quest.

Harvard Health Publishing, *the consumer health education division of Harvard Medical School*, shared some of their readers' stories about how they quit smoking. Among them was a story shared by a gentleman under the username Joan B. John, who had successfully managed to quit smoking in 1968 and never smoked a cigarette ever since, following a particular creative 'operating-on-the-**Response**'-based strategy. Here is the method explained in Joan's own words:

« I gave up smoking in 1968 after years of smoking two packs a day. I have never smoked since. The unique aspect of the method I used was that I could smoke as much as I wanted to, provided I followed simple rules. Here's how it worked:

List the following hours on an index card:

AM:1 2 3 4 5 6 7 8 9 10 11 12

PM:1 2 3 4 5 6 7 8 9 10 11 12

Day 1: Cross out all the hours you're usually asleep. These are the hours each day that you will not be permitted to smoke (this made me feel really good because it was effortless). You may smoke as much as you like during any hour not crossed out.

Day 2: Select one hour that you will not smoke. Cross it out (choose an hour where you usually do not smoke very much). Remember, you may smoke as much as you like during any hour not crossed out.

Day 3 and beyond (about 3 weeks): Repeat Day 2 until all hours are crossed out. »³⁷⁴

Joan continued: « I followed these instructions until there were three hours left where I could smoke. By then I was so disgusted anticipating the remaining hours where I would chain smoke almost two cigarettes at a time that I gave it up altogether.

»

Another example of a successful 'operating on the **Response**'-based strategy was a part of an average lady's quitting story. The latter, who shared her effective method under the username Susan B, wrote:

« When I finally quit on March 1, 1994, I had smoked for 40 years. It was extremely difficult, and I haven't even had a drag on a cigarette since that time for fear that I would start again! I used two techniques: 1) regularly reducing the amount that I smoked by 50%; 2) establishing and gradually increasing No Smoking times & places. I also had to quit drinking coffee for a while.

When I began, I had "cut back" to a pack a day. After 3 weeks, I reduced that to 1/2 a pack. I had a special box in which I put the day's allowance of cigarettes. After 3 weeks on 1/2 pack, I cut down to 5 cigarettes a day; in 3 more weeks I got down to 2 cigarettes a day.

My "No-Smoking Zones" began with no smoking while on the phone, no smoking while in the car, then no smoking in the bathroom, then no smoking in the bedroom, etc. When I was down to 2 cigarettes a day, I realized that I spent a lot of time just deciding when to smoke those two--what an addiction! At that point, I stopped entirely, and got rid of all the cigarettes in the house. After about a month, I felt OK.

The advantages for me from the way I was finally successful in quitting were that I had very few headaches, stomach aches, and not too much nervousness. I also had only a moderate weight gain. And, I was able to quit! »³⁷⁴

How clever!

It's always good to see such individuals trying to be artistically creative when dealing with what threatens their precious health. And so, by sharing their successful ideas, they

enlighten the path to those struggling with the same problem and inspire them to follow suit with the hope of achieving the same results.

In this case, Joan and Susan, whose stories I shared, did precisely the same by sharing with the world how they have managed to defeat a deeply rooted habit and make an ever-lasting change with no extraordinary resources. Only sticking patiently to their '**operating-on-the-Response**'-based strategy, which, again, they didn't know would match a scientific theory, nor did they think they would be a part of it themselves.

► **Takeaway #32**

*Breaking an old habit is no different process than building a new one, for the two processes stand on the same **S-R-R**-based principle:*

*The habit is a three-component chain. Easier than trying to break it all at once, you could only tear out one of its constituent components (**Stimulus, Response, or Reward**), and it will bring the whole chain to collapse eventually.*

The Stimulus can sometimes be a time, place, event, certain emotional status, or a group of people that you can't just get rid of all the way. More wisely, focus your efforts on breaking one of the two other less-resistant components to achieve the targeted outcome.

Only “Kaizen” to Supervise the Changing Process

Not only did those latter real stories represent some noteworthy illustrations of a successful change, but despite some variation in the details, their followed strategies were “pure kaizen”! They circumnavigated fear of change and managed to unleash creativity by taking very small steps towards their most significant achievement, which is what the old change-making philosophy, known as “Kaizen,” is all about.

Creativity is a key element to change. Fear and creativity make very bad fellows; where one exists, the other flees. “All changes,” as described by Dr. Robert Maurer –*author of the ‘The Kaizen Method’ and ‘The Spirit of Kaizen,’* – “even positive ones, are scary. Attempts to reach goals through radical or revolutionary means often fail because they heighten fear. But the small steps of kaizen disarm the brain’s fear response, stimulating rational thought and creative play.”³⁷⁵

For a time, we have been convinced that the size of the step determines the size of the result and that only big steps can lead to big achievements. Thereupon, rather than attempting to reach the target destination by taking little and doable yet persistent and constant progress towards the right direction, many have lost a fortune of time and effort trying to make it there in one giant leap of magic, which shall never happen.

The other devastating idea we have been bought into is this, which necessitates a special big occasion to embark on a new

lifestyle. People often wait for special moments like someone's wedding party, July the 4th, Ramadan for Muslims, or the most common, New Year's Eve. Kaizen, however, does not see any difference between simple (small) and big moments to spark big changes, except that the long waiting for the big moment to come is so likely to kill the initial strong desire for change and give rise to fear eventually. Not so few are the cases where people struggle and often fail even to make a start because instead of jumping in to initiate the changing process any (small) moment from then, they keep waiting for that big one to come until they are forever hopelessly doomed to fear and procrastination.

Kaizen *_as a way, culture, or a philosophy_* has long been the core of principles in many success stories. Concluding his experience as one of the most successful coaches in the history of basketball, John Wooden said: *"When you improve a little each day, eventually big things occur. When you improve conditioning a little each day, eventually you have a big improvement in conditioning. Not tomorrow, not the next day, but eventually a big gain is made. Don't look for the big, quick improvement. Seek the small improvement one day at a time. That's the only way it happens. And when it happens, it lasts."*³⁷⁶

All Kaizen asks is that you take small steps toward any life-changing success. But pay attention that the other side of the coin reads: Kaizen also asks to watch out for small steps that would take you back towards a potential failure. These small steps to the back are usually the offspring of certain minor annoyances, which are so tiny that one may not even be able to identify during the changing process unless with a careful evaluation of the progress made so far. But locating these small problems to be solved on time would save you some distressing remedies later.

One major thing to evaluate is the satisfaction you're getting from making this progress and to what level you're enjoying this new, carefully applied change. *"If you ever feel yourself dreading the activity or making excuses for not performing it, it's time to cut back on the size of the step."* thinks Dr. Maurer. *"People who are most successful at improving their health habits,"* for Dr. Maurer, *"are those who can transform exercise or eating well into a source of excitement and pride."*³⁷⁷

As for your own contentment, be reassured that this little progress that seems embarrassingly slow in the short term brings with it just about the equivalent level of satisfaction. But if you feel like your burning desire for making a quick change is triggering some sort of dissatisfaction, remember this little law well-put forth by America's Foremost Business Philosopher, Sir Jim Rhon: *"Everything has its price. Everything affects everything else. Every small discipline affects the rest of the disciplines."*³⁷⁸

If we are to see this observation in light of the kaizen philosophy, we may conclude that every step has its price. Every single step in the changing process affects the others. It sometimes takes but a tiny little step to effect a whole dramatic improvement. Make this little one today and keep persistently at it, then sit back to watch the magic of the tiny revolutionizing your invaluable health forever!

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