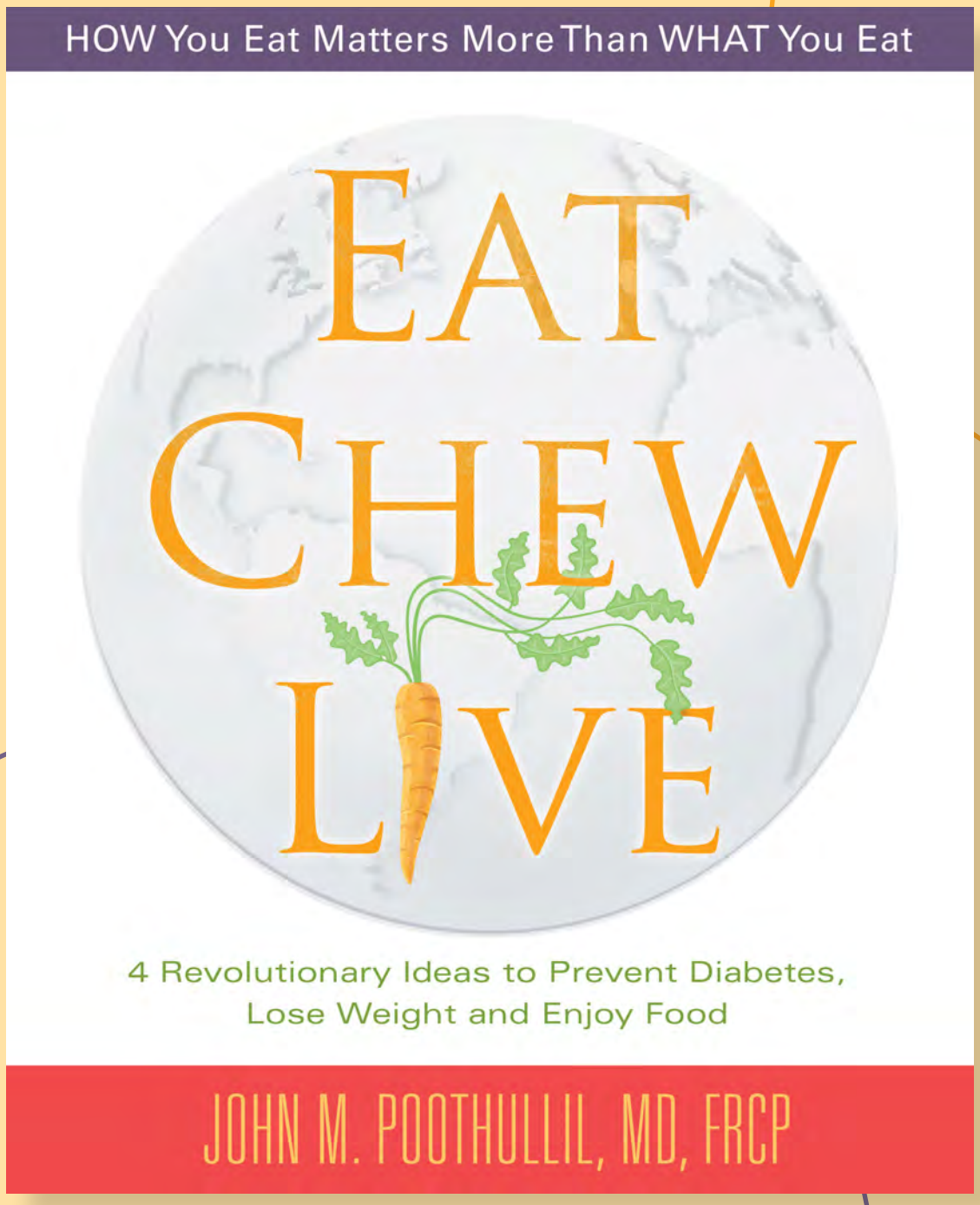
EAT CHEW LIVE

4 Revolutionary Ideas to Prevent Diabetes, Lose Weight and Enjoy Food

by JOHN M. POOTHULLIL, MD, FRCP



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New Book Offers Revolutionary Explanation for Diabetes

Diabetes is at nearly pandemic levels, with 1 in 4 adults over 65 in the US being fully diabetic and 1 in 3 over age 20 being prediabetic. In *Eat, Chew, Live,* Dr. John Poothullil argues that it is time to reevaluate the accepted theory of insulin resistance as the cause of the disease since medical research still has yet to explain how it happens or why. In its place, he has discovered a far more logical scientific explanation for high blood sugar and diabetes.

Dr. Poothullil demonstrates how the real cause turns out to be a very normal metabolism—the occasional burning of fatty acids in muscles rather than glucose. This metabolism begins occurring regularly when people overeat carbohydrates and fill up their fat cells, causing fatty acids to flow freely in the bloodstream and be used as fuel for muscle cells. Called the "fatty acid burn switch," it leaves glucose in the bloodstream, leading to high blood sugar and eventually to the diagnosis of diabetes.

"It is not logical that millions of modern adults and children around the world are suddenly becoming insulin resistant," says Dr. Poothullil. "A more sensible explanation is my theory, that overeating and easy access to high carb diets such as rice, fast foods and prepackaged products made with grain flour creates this metabolic shift in favor of fatty acids as cellular fuel rather than glucose. This is the link between diabetes, weight gain, and obesity."

With clear explanations and dozens of illustrations of the science involved, *Eat, Chew, Live* presents three additional revolutionary ideas that will help millions of people learn to prevent diabetes and even reverse it.

1. The brain ensures our survivability by monitoring our nutrient intake. We can learn to listen better to the brain's signals about hunger and satiation.
2. We each have an "authentic weight" that we intuitively know as healthy for our bodies. Returning to that weight is more difficult as we age because exercise and diet programs seldom work for adults. The key is to reduce consumption.
3. To change our eating habits, we must learn to eat *mindfully*, being more aware of chewing and tasting what we eat so that the brain can register the incoming nutrients.

"*Eat, Chew, Live* is not like other diet or weight loss books. There are no programs to follow, menus to cook, or products to buy," notes Dr. Poothullil. "This book is about respecting how your body works."

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Endorsements from Medical Professionals for *Eat, Chew, Live*

"A fascinating inquisition into the metabolic machinery of the human body with common sense advice on diabetes prevention."

—Sumit Bhagra, MD, FACE, Endocrinologist, Mayo Clinic Health System

"Dr. Poothullil presents a provocative hypothesis that will challenge physicians who care for patients with diabetes to rethink the paradigm of insulin resistance and current modes of treatment for patients with Type 2 diabetes."

—Stephen H. LaFranchi, M.D., Professor, Pediatric Endocrinology,
Oregon Health Sciences University

"As a physician and a pre-diabetic, my fascination with reading this book was personal. Books on diabetic solutions are many, but EAT CHEW LIVE is unique in that it does not prescribe any diets, provide recipes, or sell products. It suggests that the way we eat is the most effective tool to control our diabetes. I tried his suggested methods, including eliminating consumption of complex carbohydrates and taking time to chew. I was able to lose five pounds and lower my fasting blood sugar within a seven-week period. I did not use any anti-diabetic medications during this time.

I fully endorse this book for anyone who cares about his or her health and wants to live a full life. While the politics of pharmaceutical management of diabetes mellitus and the medical establishment may resist these ideas, I foresee a paradigm shift in the understanding of the cause of diabetes and how it can be prevented, reversed, or controlled using Dr. Poothullil's methods. Dr. Poothullil's decades of painstaking research and his revolutionary ideas are worth paying close attention to."

—A. E. Daniel, MD, DPM, MRC Psych, Distinguished Life Fellow of the American Psychiatric Association, Adjunct Professor of Psychiatry, University of Missouri School of Medicine

"This book is very readable. The science is understandable and backed up with analogies, such as how cells use more than one kind of fuel similar to a hybrid car. Dr. Poothullil's presents a provocative, new hypothesis on Type 2 diabetes, and its care and prevention. After reading Chapter 22, "Enemy #1—Our Grain-Based Culture," I believe nobody will be able to look at cereal, rice, and bread again without remembering it all turns into sugar inside the body."

—Janet Meirelles, BSN, RN, Certified Diabetes Educator, author of *Diabetes Is Not a Piece of Cake*

What Real People Say about Their Experience with the Recommendations in *Eat, Chew, Live*

"Since reading EAT CHEW LIVE, I've cut my insulin intake in half. I would normally visit my doctor every three months, and now I only need to see him every six months. I used to check my blood sugar twice a day, and now I only check it once. This book has made me a different person."

—Jeanne, Type 2 Diabetic, Oregon

"After implementing what Dr. Poothullil recommends in this book, I lost several pounds of weight. That was enough for me to stop the medication I was taking to lower my blood sugar. My blood pressure has also reduced to a level where I can start reducing the medication I take to control it."

—Daniel, Type 2 Diabetic, Missouri

"EAT CHEW LIVE was a real eye-opener for me. Its insights on the real causes of Type 2 diabetes are fascinating and challenge conventional thinking. Most importantly, I found it convincing. This made it easier for me to follow Dr. Poothullil's advice. I am enjoying food a lot more, while needing to eat a lot less. I have been successful for three years now in keeping my weight off and maintaining my blood sugar well below the threshold for prediabetes."

—Jacob, Prediabetic, Oregon

"I have been a diabetic for 17 years. After implementing what Dr. Poothullil described in this book, I have lost 33 pounds and reduced my insulin usage to one-fourth of what I was taking before."

—Wayne, Type 2 Diabetic, Oregon

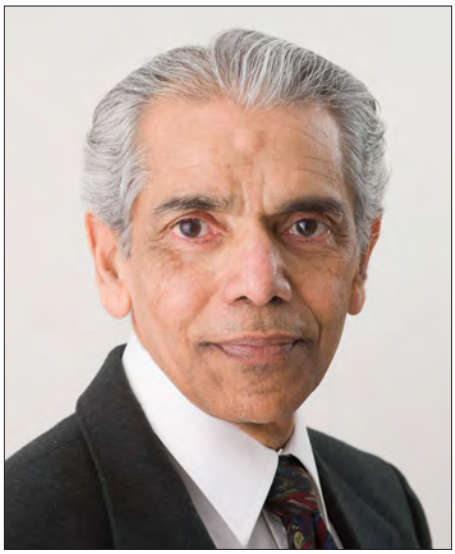
"I've had Type 2 diabetes for 25 years and have been on an insulin regiment for years. I've been doing what EAT CHEW LIVE says for the past month and I've already cut my insulin down to one-third of what I usually take. This book has made a big difference in my life."

—Martha, Type 2 Diabetic, Oregon

"Since implementing the recommendations of EAT CHEW LIVE to eliminate grain-based carbohydrates and eat mindfully, I have lost 14 pounds and my A1C has declined significantly. When I went off my new regime, my weight went up and my A1C climbed back up. I now understand the importance of sticking to the recommendations. I feel so much healthier as I approach my authentic weight."

—Rick, Prediabetic, California

Author Bio



John Poothullill, MD, FRCP practiced medicine as a pediatrician and allergist for more than 30 years, with 27 of those years in the state of Texas. He received his medical degree from the University of Kerala, India in 1968, after which he did two years of medical residency in Washington, DC and Phoenix, AZ and two years of fellowship, one in Milwaukee, Wisconsin and the other in Ontario, Canada. He began his practice in 1974 and retired in 2008. He holds certifications from the American Board of Pediatrics, The American Board of Allergy & Immunology, and the Canadian Board of Pediatrics.

During his medical practice, John became interested in understanding the causes of and interconnections between hunger, satiation, and weight gain. His interest turned into a passion and a multi-decade personal study and research project that led him to read many medical journal articles, medical textbooks, and other scholarly works in biology, biochemistry, physiology, endocrinology, and cellular metabolic functions. This eventually guided Dr. Poothullil to investigate the theory of insulin resistance as it relates to diabetes. Recognizing that this theory was illogical, he spent a few years rethinking the biology behind high blood sugar and finally developed the fatty acid burn switch as the real cause of diabetes.

Dr. Poothullil has written articles on hunger and satiation, weight loss, diabetes, and the senses of taste and smell. His articles have been published in medical journals such as *Physiology and Behavior*, *Neuroscience and Biobehavioral Reviews*, *Journal of Women's Health*, *Journal of Applied Research, Nutrition*, and *Nutritional Neuroscience*. His work has been quoted in *Woman's Day, Fitness, Red Book* and *Woman's World*.

Dr. Poothullil resides in Portland, OR and is available for phone and live interviews.

Author Statement

My journey to write *Eat, Chew, Live* has taken nearly 30 years.

I actually did not begin this project by researching diabetes itself. It started three decades ago when I was in my early 40s and I found myself gaining weight. I began by asking why people get hungry. I read medical books and observed people's eating habits. I recognized that hunger is a signal from the brain based on the *nutritional*, not just energy needs of the body. Likewise, satiation is a message from the brain not just about the fullness of the stomach but that the body has consumed enough nutrients to satisfy its needs. This concept of how the brain monitors our nutritional needs became one of the central revolutionary ideas of *Eat, Chew, Live*.

As I continued studying the metabolic processes involved in eating and digestion, my research led me into exploring how people develop high blood sugar and the concept of insulin resistance. Several elements of the insulin resistance theory made no sense to me, so I began studying other metabolic processes that could explain how glucose ends up in the bloodstream rather than being burned for fuel in cells.

After many years, I recognized the answer. It lay in the fact that our cells can also burn fatty acids rather than glucose. This insight finally led me to my theory on the real cause of diabetes: the overconsumption of complex carbohydrates (such as found in grain products), which leads to the production of fat that fills up our fat cells and causes excess fatty acids to flood the bloodstream and be used for cellular fuel. The "fatty acid burn switch" explains many of the discrepancies of the insulin resistance theory, including:

- Why weight gain can lead to diabetes and why diabetes can disappear in people who lose weight
- Why even thin people with few fat cells can get diabetes and why pregnant women can temporarily develop diabetes
- Why many populations of the world develop diabetes once they have easy access to high carb diets such as rice, fast foods and prepackaged products made with grain flour.

I am fully aware that *Eat, Chew, Live* will be controversial and many will seek to disqualify my theory. But I am hopeful that open minds will recognize the illogic of the insulin resistance theory and will consider my explanation with due seriousness. My goal is to help the growing millions of people who are unaware that they are very likely to develop diabetes, and to change the belief of millions of people who think there is nothing they can do to stop taking medications and reverse an existing case of diabetes. I also want the book to create a new awareness in the entire medical community and begin educating patients that their own nutritional choices and eating habits hold the key to preventing diabetes. Finally, I also hope that this book will influence governments who are subsidizing grain-based agriculture that facilitates food-manufacturing companies to literally create a world of diabetics.

Q & A with the Author

1. What is different or new in your book that others have not already said about diabetes?

Most popular books on diabetes attribute its cause to insulin resistance and medical textbooks also present diabetes as a hormonal disease caused by the occurrence of insulin resistance. I believe that Type 2 diabetes is not a hormonal disease for two reasons. First, the existence of insulin resistance has not been conclusively proven, exemplified by the fact that the diagnosis of this condition is made by a surrogate marker of rising glucose levels rather than by being able to measure any degree of actual insulin resistance in cells. Secondly, all the laboratory findings in diabetes can be better explained by a mechanism of nutrient overload which forces a switch in fuel usage by cells of organs such as muscles from glucose to fatty acids, whether a person is lean, obese or pregnant. This mechanism offers a far more logical explanation of the cause of high blood sugar and clarifies many anomalies about diabetes that the insulin resistance theory cannot explain. My theory can help people with diabetes in their family history and people with prediabetes from believing that they are destined to have diabetes for the rest of their life. It will also show people with diabetes how to reverse the condition and stop taking medications for the rest of their life.

2. Doesn't the entire medical community agree that insulin resistance is the cause of Type 2 diabetes?

Endocrinologists have persuaded other medical practitioners and the public to accept the idea that regardless of age, body-mass index (BMI) or gestational status, patients suddenly develop a resistance to insulin in their liver, fat cells, and muscle cells, which leads to the cells not being able to accept glucose, leaving it in the bloodstream. The acceptance of this theory by the medical community legitimizes the treatment of diabetes to be based on controlling blood sugar using drugs. My greatest fear is that medications often make patients complacent about making the lifestyle changes necessary to keep blood sugar level within normal limits without the use of drugs. Over time, many patients on drug therapies must therefore increase their dosages or even begin injecting insulin, because they are wearing out their pancreas prematurely. Numerous complications can result from the ongoing use of drugs, rather than learning how to eat properly to avoid diabetes.

3. Since medications can reduce blood glucose levels why are you against their use in diabetes?

First of all, medications are started even in a person with prediabetes on the assumption that this can rectify resistance of cells to insulin. However, we can't verify this claim because we do not have a test to measure the reduction in insulin resistance by cells of any organ in the body. Secondly, some medications force the pancreas to increase its insulin production, but this may prematurely wear out this organ and cause the patient to need insulin injections. The use of insulin injections to regulate blood glucose levels creates problems such as unexpected hypoglycemic reactions with potentially severe consequences. Other medications force the kidneys to excrete more urine since this is an effective way to eliminate water-soluble glucose, but this carries serious side effects, such as dehydration. Finally, even patients who diligently keep their blood glucose levels within acceptable limits using medications suffer complications in the same organs as those with uncontrolled blood sugar.

4. Can people lose weight and reverse diabetes by exercising and eating prescribed diets?

It is *possible* to lose weight through exercise and, in the process, reduce blood sugar levels and prevent diabetes or reverse prediabetes. However, I believe that it is *not probable* that exercise helps most adults lose weight, for many reasons. Most people simply do not exercise enough to accomplish the goal of emptying their fat cells. Exercising burns very few calories relative to one's daily intake, especially if you are already overeating. Another problem with exercise is that it does not have the same impact on weight loss as you age. It is very difficult to keep up the level of activity needed to maintain a negative calorie intake when you have aging muscles. The use of specific diets as a preventative treatment for high blood sugar and diabetes fails to acknowledge the research that proves that dieting seldom works to help adults, with or without diabetes, maintain reduced weight over the long-term. *Eat, Chew, Live* provides a new concept to explain the cause of high blood sugar and ideas that can truly motivate adults to change their lifestyle to reverse diabetes or prevent it.

5. What is your theory about the cause of diabetes?

Once you suspect that insulin resistance does not make sense because it is illogical that only three types of cells in the body become resistant to insulin regardless of the duration of the disease, then you are free to think outside the box and challenge assumptions. A few questions, for instance, are: What protects cells in other organs from becoming resistant to insulin? If muscles are not burning glucose because of insulin resistance, how do diabetic patients maintain body heat? Why do we not see progressive loss of muscle strength in adults who are diagnosed with diabetes?

My theory begins with the fact that cells are like a hybrid car; they can burn glucose or fatty acids as a perfectly normal metabolic process. When we exercise hard or fail to eat enough, the body begins breaking down the triglycerides stored in our fat cells and burning the resulting fatty acids in muscle cells.

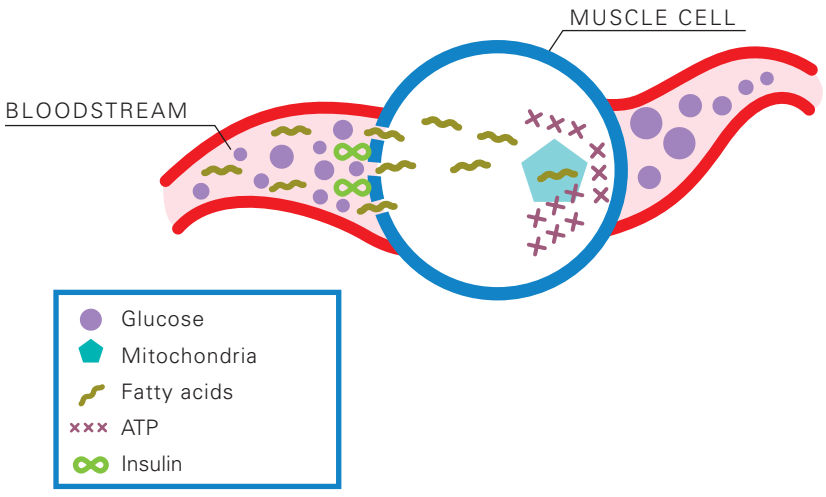


Figure 11. Muscle cells can burn glucose or fatty acids. The abundance of fatty acids in your blood triggers muscle cells to begin burning fatty acids rather than glucose. Once muscle cells have switched to burning fatty acids, even the presence of insulin cannot force glucose into the cells since they simply don't need it. As a result, glucose remains in your bloodstream, causing high blood sugar.

This metabolic process not only helps to maintain body heat and muscle strength but also is a tip-off to the cause of high blood sugar and diabetes. Here's why:

When you eat, food is broken down in the intestines into its many nutrient components, one of which is glucose. Glucose not immediately used for energy in your cells is converted in the liver to triglycerides, which are stored in your fat cells. When you overconsume food over many years, you eventually fill up your fat cells with triglycerides. Every person has a certain allotment of fat cells, whether they are thin or heavy. At some point, you run out of room in fat cells to store triglycerides. Instead, these molecules are broken down outside the fat cells into fatty acids that enter the bloodstream, and as stated above, muscles burn these instead of glucose. This leaves glucose in your bloodstream that your body should have been burning, creating high blood sugar. If you maintain increasingly high blood sugar for a long period of time, you end up with diabetes. This metabolic explanation for diabetes makes far more logical sense than sudden insulin resistance in only three types of body cells.

6. Is stress a factor in triggering diabetes in your theory?

Stress by itself need not lead to diabetes. Otherwise a majority of people would become diabetic since almost everyone experiences stress in one form or another. However, it can contribute to the development of diabetes through several mechanisms. Using food frequently as a stress reliever could lead to weight gain and fullness of fat cells. Second, cortisol, released in response to stress, can promote the exit of fatty acids from fat cells. In addition, growth hormone released during stress can enhance fatty acid burning in cells. In these ways, stress may contribute to the fatty acid burn switch that leaves glucose in the blood. In addition, cortisol stimulates the liver to produce glucose from amino acids that come from the overconsumption of proteins, thus flooding the bloodstream with even more glucose.

7. It is believed that diabetes can be controlled, but you suggest that it can be reversed, how?

It is possible to lower blood sugar and reverse diabetes even in people who are already using insulin. By losing sufficient weight through avoidance of the very foods that fill up your fat cells—i.e., *grain-based complex carbohydrates*—you create space for the circulating fatty acids to be stored as fat. Your body will therefore switch back to burning the glucose as its main source of fuel and you can maintain normal blood sugar by continuing to avoid the consumption of grains and grain-based foods on a regular basis. You can verify the reversal of diabetes by doing a glucose tolerance test that is commonly used to diagnose or rule out this condition.

However, it is important to note that if you have diabetes, it may have already caused damage to your nerve tissues, eyes, kidney, or other organs. Reversing your diabetes will not reverse the damage that has already been done, but it can help ensure that no further damage will occur.

8. Your book says, "How you eat is more important than what you eat." What does this mean?

Instead of the traditional classification of foods into groups of protein, carbohydrate, fat, vitamins, minerals, etc., this book is based on becoming more aware of what your body is trying to acquire from eating: nutrients. The human brain evolved to help us survive and one of its critical functions is to monitor our nutrient intake to ensure we have the nutrients we need. The brain is enormously sophisticated and it communicates with every cell in the body. This means that if we pay attention more closely to our brain, we will be able to decipher more clearly its hunger and satiation signals. The brain informs us when we need nutrition and when we have consumed the right nutrients. It especially uses our taste and smell receptors to assess the nutrients in our foods. We must therefore eat "consciously" and "mindfully" – by chewing slowly and fully, letting the taste and smell receptors register the nutrients in the food. The title of my book—*Eat, Chew, Live*—is a strong reminder that learning to eat slowly and savor your food is far better for your health than eating a predetermined type of food or eating until your stomach can hold no more.

9. Does your book recommend a special diet or are you selling any types of foods?

My book does neither of these, as my belief is that everyone has a natural mechanism to acquire nutrients needed in the body on a timely basis. My philosophy is that every individual needs to learn how to listen to his or her body. A recent research report showed that four common brand-name diet plans had little impact on helping people maintain reduced weight over the long-term. The goal of *Eat, Chew, Live* is to teach people why they need to avoid grain-based complex carbohydrates as these are the main cause of high blood sugar. I explain in the book how everyone can learn to listen closely to their brain's natural signals of hunger and satiation and override the bad eating habits they formed over time due to stress, social pressure, and the mass marketing of unhealthy foods.

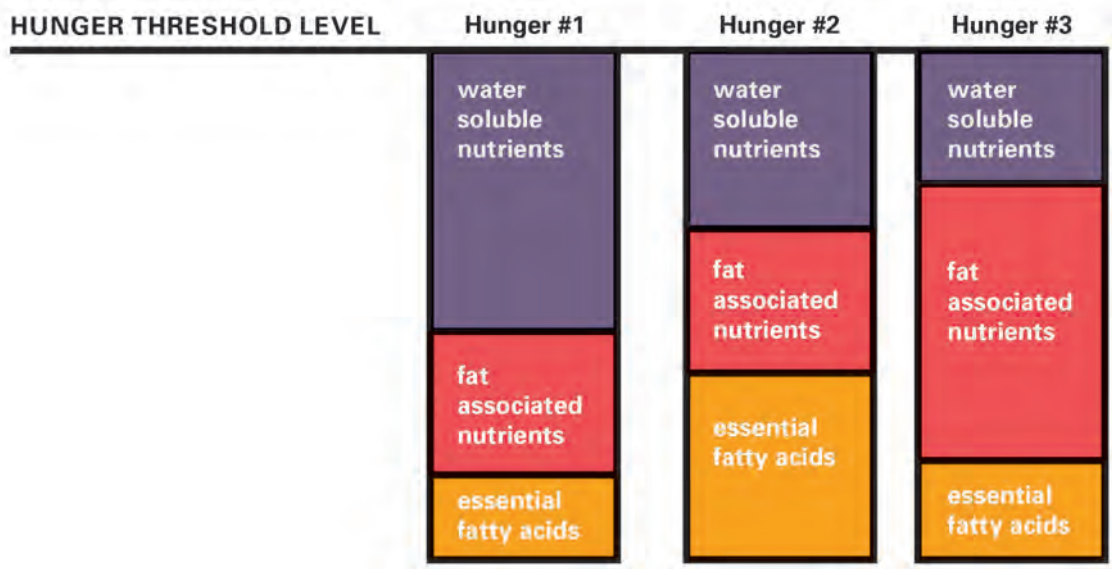


Figure 20. Your brain detects what and when nutrients are lacking. The deficiency of each nutrient is added up to a threshold level. This is why the hunger sensation can be experienced at any time, not just at fixed intervals during the day.

10. Many celebrations and social events involve eating. I feel the urge to eat more because of the setting or occasion.

How many times you eat is not as important as how much you eat. The most important thing is to listen to your body's signals and adjust your food intake based on need. Remember that you have no business eating unless you're hungry. If you're organizing the event, try to have specific meal times rather than having food available all the time. Use a specific area or table to serve the food. Make people have to rise up and walk to get their food rather than bringing food to them at their tables.

11. Experts say that eating whole grain foods is beneficial because they contain vitamins.

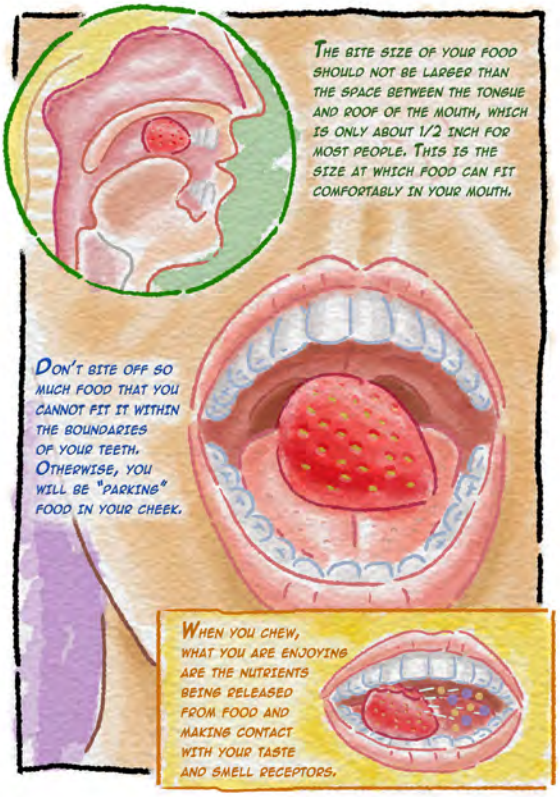
Any product made from grains is still a complex carbohydrate that breaks down into glucose in your intestine. Don't be fooled by advertising claims such as "whole grain," "no cholesterol," "gluten free," "fortified with vitamins and minerals," and "no high-fructose corn syrup" because these claims do not change the basic composition of these products; they are still foods that will elevate blood sugar and lead to diabetes. You can acquire the needed vitamins from vegetables as long as you eat a variety of them.

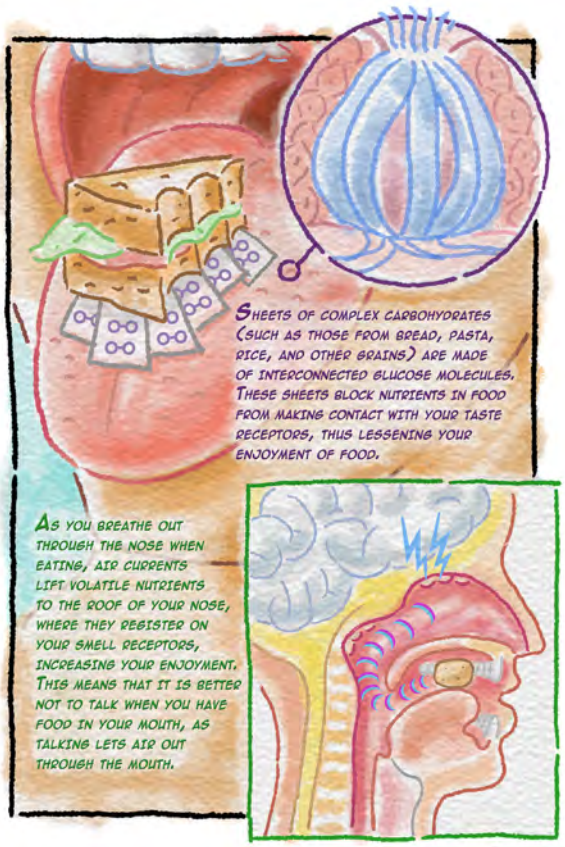
12. Why is diabetes spreading even in developing countries like India and China?

The fact that diabetes is occurring in many countries of the world is actually proof of my theory. If you think about it, it is illogical that millions of people around the globe are suddenly developing insulin resistance, as if it were an infectious disease. It is far more logical to think that something in their diet is creating the conditions for diabetes. And indeed, this is what we see happening. It is not surprising that diabetes is on the rise in countries that are relying increasingly on mass-produced and heavily marketed grains and grain-based breads, sweets, and packaged foods. These are products that often utilize cheaply produced flour, have had sugar added to them, and that contain high amounts of salt, which tends to reinforce feelings of hunger for carbohydrates (a metabolic reaction which is explained in my book).

How You Eat Matters More than What You Eat

Sample of Storyboard Inserts





TALKING POINTS TO ASK DR. POOTHULLIL

- Why do you believe that insulin resistance is not the cause of Type 2 diabetes?
- What do you think causes diabetes?
- Why do you believe grain products like bread, rice, and corn contribute to causing diabetes?
- What are 3 things you feel people should do to avoid getting diabetes?
- Why are you concerned about the rise of diabetes in the world?
- How do you suggest people lose weight?
- What can people do to avoid overeating and gaining weight?
- What do you mean by "mindful eating?"
- Can you elaborate on how your book will help people reverse their existing Type 2 diabetes?
- Have you beta-tested your approach on diabetics and if so, can you share some of their experiences?
- Why are you against medication to control diabetes?
- Have you received any feedback for your book from the medical community?
- Why do you believe that the theory of insulin resistance has gained such widespread acceptance?
- What do you think is the biggest challenge for diabetics who want to adopt the approach described in your book?

CHAPTER 3

Why the Insulin Resistance Theory is Questionable

I have examined the insulin resistance theory in depth for years, and have concluded that it doesn't make biological sense. Proof of this is evident if we examine many related mechanisms of the body that should suffer or be altered if insulin resistance were true. Let's review these anomalies that demonstrate how insulin resistance cannot explain the cause of Type 2 diabetes.

1. No loss of the body's ability to regulate heat

If the millions of cells in the body were resistant to insulin, particularly in our muscle tissue, we would expect the body to have great difficulty regulating its consistent internal temperature, 98.6 degrees Fahrenheit. Let me explain why this would happen.

The body is like a home furnace that burns glucose to produce heat. Under normal conditions, the temperature of the inner core of the human body remains constant within ±1 degree Fahrenheit 24 hours a day. Even when the outside air temperature ranges from a low of 55 degrees Fahrenheit below zero to a high of 130 degrees Fahrenheit, the body still maintains an almost constant internal core body temperature. In contrast to our core temperature, our skin temperature can rise and fall with the temperature of the surroundings.

Where does the body get this internal heat? In babies, specialized fat cells containing "brown fat" generate heat mainly to warm major blood vessels that supply the brain with blood. Cells storing brown fat are different from regular fat cells by virtue of their ability to produce heat instead of ATP molecules in their mitochondria. The survival of rodents during exposure to cold temperature is a testament to the ability of their brown fat cells to keep them warm. Brown fat cells play a much smaller role in warming the human body, especially in adults who have reduced amounts of brown fat.

In adults, we get our heat from the many metabolic activities occurring inside each cell. As you learned, ATP, which is made from glucose molecules, is the ready source of energy in every living cell. Many calories of energy may be contained in each ATP molecule, but only a few are needed for the molecular reactions in the cell. The remainder of the energy created when ATP decomposes is distributed in the body in the form of heat, just as your entire kitchen heats up when you are cooking in the oven.

Even under the best of conditions, only 30 percent of the energy from food is used for metabolic functions of the body. The excess heat from each cell contributes to maintaining your body's core temperature. Highly active organs such as the liver, brain, heart and skeletal muscles produce most of the heat in the body. It's amazing that the core body temperature is kept within a very narrow range with contributions from trillions of tiny furnaces.

Given that about 40 percent of the body is skeletal muscle which consumes 80 to 90 percent of the glucose from your food, it is clear that muscle activity contributes a significant amount of the heat used to maintain the body temperature. But here's exactly the proof that insulin resistance is not a valid theory. If muscle cells supposedly cannot utilize glucose as fuel because of insulin resistance, then maintaining our body temperature would be significantly impaired. However, there is no evidence of impaired body temperature maintenance in individuals with Type 2 diabetes.

One might argue against this proof, claiming that perhaps other parts of the body compensate for impaired glucose-generated heat production in muscle cells. Perhaps other organs begin to function at a higher level to produce enough heat to compensate for the loss of heat from muscles resistant to insulin. But if this were true, we should see evidence of increased activity of the involved organs and systems contributing to the maintenance of body temperature.

But we don't see such evidence. No other body organ has been found to be extra active and no byproduct of activity from other organs has been detected in excess of normal in individuals with Type 2 diabetes. Increased metabolic activity leading to greater heat production in organs other than muscle has not been found.

In short, it does not seem that insulin resistance can explain why our muscles continue to function and even generate the heat our body needs to maintain its constant temperature, nor do we see other organs compensating for a lack of muscle-powered heat. Our muscles continue to derive energy even while glucose is not getting into them. (Keep this point in mind, as it is a key point in my alternative theory. Our muscles are deriving energy from something and don't need the glucose. We'll return to this point shortly.)

2. No loss of muscle strength

If insulin resistance prevented muscles from using glucose, we should see evidence of a weakening of muscle function, just as you would expect an automobile to function poorly if the engine's ability to burn gasoline was impaired.

A muscle consists of fibers that are made of protein filaments. When muscle fibers contract, one type of protein filament pulls itself over another, similar to a person climbing up a dangling rope using both arms. While some "arms" of the protein filament are gripping, others relax. The addition of ATP is essential for the "arms" to relax, so that they have the energy for the next grip. (The most extreme example of what happens when there is no ATP to make muscle fibers relax is "rigor mortis," the state of contracture that occurs after death.)

This suggests that if the main source of ATP is glucose metabolism, the absence of glucose due to insulin resistance should prevent muscle fibers from relaxing. However, diabetes does not prevent people from running, jumping, lifting heavy boxes, dancing, skiing, or walking. Type 2 diabetics are often aging seniors who are losing muscle mass, but not at rates faster than the general population of seniors. There is no evidence of progressive weakening of muscle power or deterioration of muscle function in individuals with decades long Type 2 diabetes, even if they required increasing doses of medications including insulin to regulate their blood sugar levels. In short, it seems unlikely that insulin resistance prevents muscles from obtaining energy, even if it is not facilitating the entry of glucose.

3. No loss of triglyceride production in the liver

Some medical scientists have suggested that the liver is the first organ to show resistance to insulin. Given that insulin normally *restricts* glucose production in the liver, a person with Type 2 diabetes with insulin resistance

should produce lots of glucose in the liver (since the insulin is not working to restrict it). The scientific evidence to support this claim is the fact that, in people with Type 2 diabetes who are fasting—and thus not consuming carbohydrates—we do see a rise of blood glucose proportionate to glucose production in the liver.

But let me counter this argument. When more carbohydrates are consumed than can be used for immediate energy, insulin normally promotes the conversion of excess glucose into fatty acids in the liver. These fatty acids are subsequently converted to triglycerides and transported in the blood to fat cells for storage. If the liver becomes resistant to insulin, however, triglyceride formation in the liver should be correspondingly reduced. Yet the level of circulating triglycerides is higher than normal when a Type 2 diabetic person exhibits an elevated glucose level in the blood. How does it happen that insulin resistance causes both high glucose production AND high triglyceride production, two mutually exclusive processes?

It could be argued that the finding of increased glucose production and high triglyceride formation in the liver at the same time occurs because *only part of the liver* is resistant to the action of insulin. But there are no observations to explain why different parts of the liver would react differently to the presence of insulin. There are also no observations explaining how this is sustained throughout the life of this condition in someone with Type 2 diabetes.

4. No finding of any agents that block insulin

With many diseases, an agent such as an antibody is sometimes found to block the utilization of molecules in cells. Given this pattern in the body, insulin resistance might be considered the result of such an agent blocking the attachment of insulin to its receptor on the cell surface. Yet no one has discovered or demonstrated an agent that blocks the binding of insulin with the insulin receptor on cells at the time Type 2 diabetes is diagnosed.

5. No proof that changes in cells cause a failure to recognize the presence of insulin

Some might suggest that resistance to insulin could occur because the cells that should respond to the presence of insulin outside them do not do so. Or, perhaps some event has occurred in the cell to negate its response to insulin, such as a change in the manufacture and movement of modules needed to transport glucose inside the cell.

However, here again there is no evidence of fluctuations in the number of insulin receptors or a lower level of function in the insulin-resistant organs corresponding to the fluctuating levels of insulin.

6. No other cells of the body appear to develop insulin resistance

Under the same principle of elevations of insulin and glucose levels in the blood, it can be argued that every organ in the body of a Type 2 diabetic should exhibit insulin resistance. But they don't. One might claim that every cell, as an independent living unit, has to have a mechanism to restrict the entry of nutrients it does not need. Without such a safeguard, the cells of insulin-sensitive organs would have to mobilize glucose transport modules that allow for the entry of glucose until glucose and insulin levels are normalized in the blood, regardless of their glucose usage or the glucose storage capabilities inside them. But this also does not happen.

In short, no one has proposed a theory that explains how cells other than those of skeletal muscle, the liver and fat tissue avoid the fate of becoming resistant to the action of insulin.

The Only Logical Conclusion: Insulin Resistance is Incorrect

All the above arguments point to gaping holes in the theory of insulin resistance as the cause of Type 2 diabetes. To date, there is absolutely no proof that insulin resistance accurately explains why the body's cells do not intake glucose the way they normally do. In addition to the six anomalies I raised above, many other questions need to be answered before insulin resistance can be accepted as the causative mechanism of Type 2 diabetes, including:

- Why would the body suddenly develop resistance to the action of one of its own hormones?
- Why do sensitive cells only target insulin as the hormone they are resistant to when there are other hormones they could also be resistant to?
- Is the biology behind such a development the same in all individuals who become diabetic, whether they are obese, thin, young or pregnant?

Furthermore, we have no information on whether the cause of resistance and the mechanism by which it occurs are the same in all affected cells—skeletal muscle, the liver and fat cells. In the absence of an obvious biological mechanism to explain how resistance occurs, it is scientifically unsound to claim that these three types of cells are the only organs in Type 2 diabetes afflicted with insulin resistance.

KEY POINTS

- The insulin theory of diabetes actually proposes two concepts: 1) that the pancreas stops producing enough insulin and eventually becomes worn out trying to produce more, and 2) certain cells of the body—the liver, muscle cells, and fat cells—become resistant to the presence of insulin.
- The first concept could be plausible, but why don't other organs of the body wear out? And why doesn't insufficient production happen to all or most people?
- The second concept might make sense, also, but there is no proof for how insulin resistance occurs or why it happens in just three body tissues. There is also no explanation for why the liver produces both high amounts of glucose and high amounts of triglycerides, two mutually exclusive processes.

CHAPTER 28

Three Reasons People Overeat

You probably love food. It's hard to resist a good meal. But until you began reading this book, you may not have thought much about food as a collection of molecules containing the nutrients your cells need to function. You of course know that food provides your body with energy and vitamins and minerals, but what has been missing in your understanding is the impact of what you eat at the micro-level, where food breaks down into single molecules of energy nutrients and essential nutrients. You probably also never thought about your brain as a regulatory system that actually monitors and tracks your nutrient intake—using your taste sensors, smell receptors, the sensations in your mouth, the hormones in your stomach and intestines, and the levels of glucose and nutrients in your blood as it flows through the brain.

If these sophisticated mechanisms have developed in humans, why do we overeat? Why doesn't the brain help us completely regulate our sensations of hunger and satisfaction such that we never gain weight, never consume too much food that floods our bloodstream with glucose, and never develop high blood sugar and diabetes?

I suggest there are three reasons why people override their brain's regulatory system and overeat:

1. Dopamine based: eating for the pure enjoyment of eating even when not hungry.
2. Fullness based: eating only when hungry, but continuing until feeling full.
3. Stress induced: eating to relieve stress and anxiety.

People who tend to overeat often do so for two or three of these reasons rather than just one. The commonality between these is that they all demonstrate that when we overeat, we override the brain's hunger and satisfaction signals.

Let's examine these three reasons to better understand them. In the next chapter, we will discuss how to overcome them.

Dopamine based: Eating for Enjoyment without Being Hungry

The factors that fuel the desire to eat when you are not hungry are likely complex. As an infant, toddler, and very young child, you probably did not overeat when you were not hungry. Most very young children tend to be completely in touch with their hunger and satisfaction signals. They only eat when hunger drives them to do so and then only as much as they can handle.

I suggest that non-hunger eating begins more or less as a temporary and occasional accident, done without recognizing its long-range significance. In most people, it occurs as incidental to other events or situations, such as a family picnic or holiday dinner, a chance meeting with a friend, or an unplanned spur-of-the-moment meal with someone. It is not a deliberate act of eating, but a random occurrence.

However, the more these eating events occur in one's early life, the more repetition reinforces the brain to make connections between eating and enjoyment. Whether you are hungry or not, if food is available and

appealing, you learn to feel it is okay to eat it. You may sense that it's not appropriate to be eating when you are not hungry, and even those who cared for you during your childhood might have told you not to do it. But little by little, you begin to rationalize that since food serves a good purpose, eating just a little bit without being hungry can't be that bad. The enjoyment of discovering new foods and the pleasure of eating them eventually overcomes your natural inclination to wait for the sensation of hunger.

Over the years, your mind develops ways to rationalize and minimize the unwanted consequences of this eating behavior. You may start to gain weight, but tell yourself, "It's just a few extra pounds and I can take it off easily." You may know that you are eating too much, but dismiss it by thinking, "I can stop doing this any time I want, but for now, I'm enjoying this food." This pattern of eating may even be strengthened by those around you who are doing it, too.

A repetitive act is reinforced when it is accompanied by strong feelings. In this case, it is the pleasure associated with food. You begin to establish a behavior of eating when stimulated by the sight, smell, or even just the thought of food rather than by your body's hunger signals, just because you like the feeling of enjoyment. The connection between food and enjoyment is stored in your memory and expresses itself without any conscious or deliberate effort. Smelling food cooking, walking into a colorful supermarket, passing by a restaurant—all these trigger in you a pleasurable feeling caused by the release of *dopamine*, a neurohormone, that prompts you to want food. You look forward to enjoying a variety of good quality, tasty foods.

Once you reach this stage, however, you may easily fall prey to craving foods that combine sugars, salts, and fats of different properties in optimum ratios to create items that intensify the feeling of pleasure you seek.

Once this rationale is established, even your awareness or the presence of adverse long-term consequences such as weight gain, high blood sugar, high blood cholesterol, or high blood pressure may not be sufficient deterrents to modify your response to food. This is because the brain has difficulty connecting behavior with long-term consequences. If the ill effects do not immediately follow the causal action, it is easy to rationalize a behavior. Your subconscious mind can't make value judgments, deciding whether what you're doing is good or bad. It simply remembers and accepts what you have been doing and facilitates the execution of the established behavior. The behavior continues, even when the consequences are damaging.

This pattern of behavior is not unlike other behaviors you might cultivate for pleasure, such as gambling, work, sex, or even accumulating wealth. Once you begin the activity, it becomes difficult to stop repeating it over and over.

Fullness based: Eating Only When You Are Hungry . . . but Overeating

If you are good at waiting for your hunger signals and not eating prematurely when your body needs nutrition, what would cause you to be unaware of the signals of satisfaction your body generates for you? There are likely several possible explanations for this behavior.

The first might be that you overeat in the sense that you simply consume too much of the wrong food. Your diet may emphasize grain-based carbohydrate, natural sugars, salt, and fat that provide your body with an excess of nutrients it cannot immediately use. While you may believe you are eating appropriate portions, the fact that your choice of foods is skewed means you are filling your body with glucose, fatty acids, and salt. The more you eat these foods, the harder it becomes to maintain your authentic weight and to prevent the onset of high blood sugar and possibly diabetes.

This type of overeating can also begin unconsciously. While hunger triggers the conscious decision to initiate eating, your subconscious mind is not controlled by rational thought and is easily swayed to follow eating patterns you established long ago. For example, if as a child or teen you repeatedly consumed fruit juice or soda in response to thirst, the subconscious mind can interpret the thirst sensation as a need for soda and not water. (Are you one of those people who drink soda all day long?) If you routinely had eggs and bacon for breakfast when you grew up, the brain could create a craving for these in the morning even though the body does not need nutrients from these items. In effect, you may be hungry when you eat, but you consume too much of the wrong nutrients out of habit.

The second reason you may overeat is similar to that of a person who enjoys food and has built up a behavior based around the pleasure of eating. You may wait for the hunger signal, but once it starts, your enjoyment takes over and you cannot stop yourself. However, instead of variety or quality, the quantity of food becomes the pleasure-generating factor for you. You have long stopped paying attention to the feeling of satisfaction during a meal. You wait for the stomach to stretch almost to the point of discomfort to stop eating.

Your uncontrolled enjoyment may also have started accidentally by overeating at family events, parties, business outings, and trips to new places where abundant (and sometimes free) foods are found. Repeated overeating at such events reinforces the feelings of pleasure you derive from getting full, and they become ingrained in your unconscious mind. The absence of immediate negative consequences following an excessive intake of food can lead to a behavior pattern in which you rationalize overeating with excuses such as, "I was really hungry" or "I just wanted to taste that new dish," or "I skipped lunch so it's okay if I eat a lot at this party." You might also be influenced to consume a lot of food by external factors such as dining with friends who overeat, going to an expensive restaurant where you want to partake of the luxury and get your money's worth, and many other situations.

Stress induced: Overeating in Response to Stress

Stress is any stimulus that alters the meaning or intensity of your feelings, actions, or communications. Signals that you interpret as harmful to your safety, security, or health are the ones that cause a stress response. The stimuli that cause stress are essentially the same for most people—perceived threats, illness, injury, or inconveniences. The intensity and duration of the stimuli needed to elicit the stress response varies for each person. One individual may be able to handle many difficult life events that another person would find highly stressful. It seems true that one's conditioning and training to cope with stress starting in early childhood and continuing to adulthood determines your sensitivity to stressful stimuli.

In general, people experience stress as two powerful feelings: fear or hurt. Fear can be imagined or real and based on known or unforeseen factors. Fear, by definition, is more emotional than rational. During the fear response, neurons located in the primitive core part of the brain are activated before the stimulus can be analyzed on the intellectual level to determine if it is real and deserves a thoughtful reaction. Fear rather forces you to determine what to do based on an incomplete analysis of partial information. Hurt can be physical or emotional. It can be based on a current event or a past experience.

The time of onset, degree, and duration of the stress response vary with each individual, based on hormones released in the body during the stress response. For instance, let's look at anger, a feeling of displeasure aroused by a real or imagined stress. If your body releases adrenaline at the slightest provocation, you're a person who

will get angry quickly and easily. If the amount of adrenaline released is large or if your sensitivity to it is high, the intensity of your anger will also be high. If you remain in the stressful environment or dwell on the stress in your mind, your body can continue releasing the hormone for a long period, setting the stage for prolonged anger. If you routinely expect a person or event to create displeasure for you, it may cause you to be angry each time you encounter that person or event.

How and why does stress cause people to overeat? The two are actually quite connected. As you recall from earlier discussion, adrenaline is released in the body in between meals to facilitate use of fatty acids as fuel. If you become stressed when you're hungry, or vice versa, more adrenaline is released. One of the reasons eating helps you feel better is because food in your digestive system helps slow the release of adrenaline. The experience of feeling calmer and more relaxed after eating sets up a behavior pattern that promotes eating when you feel stressed.

A second reason people eat when feeling stressed is that the body's stress response causes you to seek out some action to mitigate the stressor. You feel you have to do something to relieve the stress. For many people, the action of preparing and eating helps them stop thinking about the stressor or believe that they are managing it. Through the repetition of this behavior, eating often becomes an automatic process for stressed-out people to meet the challenges of their lives.

The irony about stress is that some people enjoy creating a sense of stress out of ordinary life events because they become habituated to the adrenaline in their body. They heighten events through thoughts that make them feel internally stressed, out of which they believe they become more energetic. In their mind, stress sharpens their focus and helps them perform at a higher level. They actually feel lethargic without some stress in their life. Some utilize stress in a creative way to accomplish their artistic objectives. Others may invent a stressful situation just to experience a thrill. For example, those who drive at high speeds or ride roller coasters do so for the pleasure they get from putting themselves in stressful situations.

Some "adrenaline junkies" use food or drink to counteract or complement their love of stress. They may drink coffee, soda, and sweetened beverages frequently during the day. In their jobs, they may drive themselves to keep working right through lunch time, scarfing down snacks and carbohydrate-rich foods and guzzling soda to hold them over until dinner time. In the evening, with their body depleted of energy, their brain is hungering for good nutrition so they finally eat a full meal. However, their lack of balance and control during the day often drives them to overeat as this becomes the only opportunity they have to enjoy their food— and so they overindulge in the pleasure of eating. This again becomes a common behavior pattern for stress junkies.

How Your Brain Reinforces the Pleasure of Eating

We need to recognize that the apparent innocuous "over-enjoyment" of food is a common theme among all three types who overeat. In all cases, we saw how random and accidental instances of overeating might initiate a seemingly innocent habit that you are initially able to find excuses for. But with increasing repetition, the rationale you give yourself for overeating becomes embedded in your subconscious mind. Little by little, overeating is transformed into a consistent behavior pattern of adulthood. It doesn't matter whether you overeat when you are hungry, not hungry, or under stress. Overeating becomes part of your conscious behavior. You believe you can consume as much as you want, even in the presence of side effects that you dismiss.

When the instinct to eat is repeatedly supplemented by a habitual inclination to overeat and eventually replaced by it, your brain has activated the area that generates a desire to eat while suppressing other areas

that usually warn you about the dangers of overeating. You have replaced your instinctive pattern of eating for nutrition because you now have a different priority—*deriving pleasure from eating.*

At the core of this behavior is the "pleasure mechanism" in the brain that controls the nutritional regulatory system. This mechanism utilizes two complementary sets of neurohormones. The first set that the brain releases to create satisfying feelings are *endorphins*, which are morphine-like neuropeptides released in the brain. These are the brain's natural painkillers that produce a sense of well-being and calm. This neurohormone may have originated as a reward when the body met basic necessities such as nutrients.

As mentioned above, the second neurohormone is *dopamine*, which produces the feeling of pleasure when you imagine a good meal. The dopamine system may have evolved as a way to feel rewarded by meeting the body's need at times of extreme deprivation of water, salt, glucose, and other nutrients. This feeling can be more intense than endorphin-based satisfaction because the situation was dire. For example, when feeling extremely thirsty, drinking a glass of water can be one of the most pleasurable feelings you have.

From a biological standpoint, the human body was not constructed to overeat on a consistent basis and gain excess weight to the point of causing high blood sugar and diabetes. As stated before, the body doesn't need to store more than a small amount of fat. The purpose of our digestive system and fat cells are to capture nutrients we might need on an immediate "just-in-time" basis. Similarly, the brain's neurohormone system of endorphins and dopamine was designed to produce feelings of satisfaction and pleasure when we consumed food that supplied our body with the nutrients it needed. The neurohormone system complemented our hunger and satisfaction signals.

What is happening to humans in much of the world is exposure to an endless variety of foods that activate our excitement and pleasure. It is biologically natural to feel a desire to eat these foods. But as we begin eating too much of the wrong foods that are mass produced in our industrial food complex—grain-based carbohydrates, natural sugars, fats, and salt—we reinforce behaviors that repeatedly trigger the pleasure system of the brain. We thus begin overeating regularly because it induces these pleasurable feelings and we are no longer content to feel the enjoyment that comes with eating enough to feel just satisfied.

Evidence of this abounds in Western societies where high blood sugar and diabetes are rapidly increasing. Restaurants continue to serve extremely large portions compared to the amount of food a normal human actually needs for nutrition in a single meal. Some restaurants even make an entire business out of offering people expansive 'all you can eat' specials, as if to challenge them to overeat until they are bloated and sick. Sugared drinks and food products packed with carbohydrates and salt are packaged and marketed in ways to make us associate them with happiness, sexuality, success, and good times. Even when people cook at home, they have trained themselves through habit to serve large portions and eat everything on their plate regardless of the signals they may receive from their mouth.

The occasional and random overeating that might have happened when we are young becomes a routine and acceptable lifestyle for most adults, driving an inevitable pandemic of high blood sugar and diabetes. I am not denying that food is enjoyable and creates pleasurable feelings in the brain. However, whether you overeat when you are hungry, not hungry, or stressed out, you lose control of your brain's two natural systems—the nutritional regulatory system and the pleasure system. This is unfortunate, because heeding these systems could prevent you from falling ill and possibly dying early.

People in Western societies are losing control of the natural human mechanisms to eat healthy and enjoy their food to powerful external forces that are motivated by profit—the food industry and marketers of food

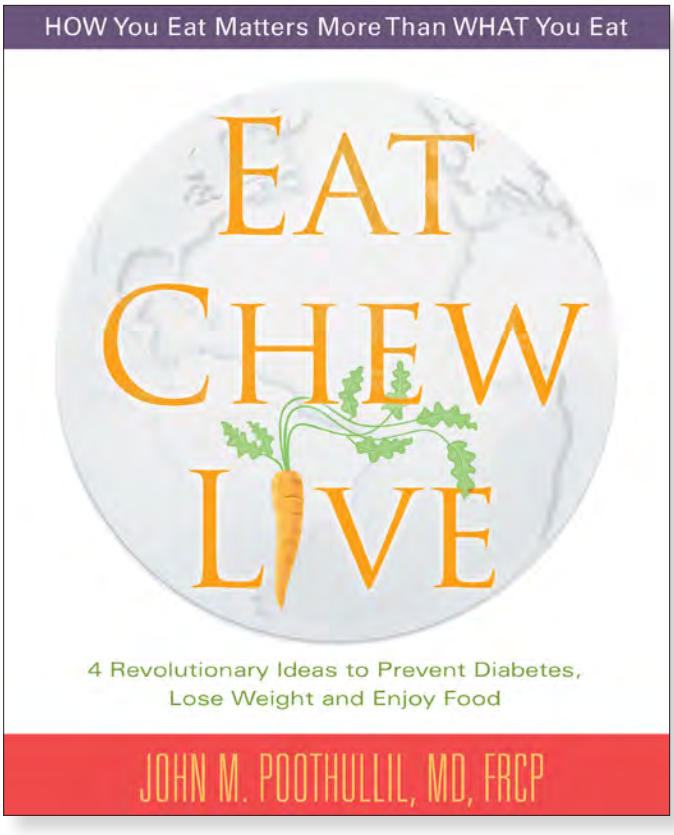
products. Diabetes has existed as a rare human condition for thousands of years, a biological phenomenon based on bodily chemistry. However, with obesity in some countries now reaching 30 to 35 percent of the entire population and being seen in children as young as ten years old, and diabetes affecting an estimated one-third of the entire global population, it is clear that factors outside of normal human biological phenomena are driving epidemic levels of this disease. Nothing short of a revolutionary approach can reverse this epidemic.

KEY POINTS

- The three reasons why people override their brain's regulatory system and overeat include eating for pure enjoyment even when not hungry; eating only when hungry but overeating, and eating to relieve stress and anxiety.
- Non-hunger eating often begins as a temporary and occasional accident, but through repetition, the brain connects overeating and enjoyment.
- The "over-enjoyment" of food may seem innocuous at first, but through repetition, it becomes a habit and you replace your instinctive need to eat with *deriving pleasure from eating,* despite negative consequences for your body.

EAT CHEW LIVE

4 Revolutionary Ideas to Prevent Diabetes, Lose Weight and Enjoy Food



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