8 reasons why it’s not your fault you’re fat

We’ve gone way past the Thermodynamic Equation to explain obesity—calories in, calories out. While losing pounds is still, to a large extent, about good diet and exercise, many individuals find themselves stuck at a higher-than-optimal weight despite earnest efforts.

It’s not entirely a merit system. Subtle factors beyond our immediate control subvert our efforts at weight loss. Here are some of the most important:

1) Genes: There is no single “obesity gene,” nor is heredity destiny. Even those highly predisposed to being overweight can overcome their genetic programming—they just need to work harder than the average person.

As near as we can tell, certain genes increase the risk for insulin resistance; others govern satiety; some make a person more subject to “disinhibition”—a trait that makes you more likely to respond to environmental cues to eat; some lay the foundation for a slowed down metabolic machinery that thwarts fat-burning; others make individuals into fastidious tasters, rendering them more likely to pursue rich foods for gratification and to eschew more nutritious, less calorie-dense fare.

And genes are not even hard-wired. New studies suggest that stress and starvation “turn on” otherwise silent fat genes that can be transmitted to subsequent generations. In this way, as in the ancient Biblical passage, “The Lord . . . visitest the sins of the fathers upon the children unto the third and fourth generation.”

Putting all these genes into a meaningful equation that predicts obesity is a little like designing an algorithm to forecast next year’s weather; it requires immense computing power. And we’re only just now tapping the enormous potential of genetics to predict disease. Gene testing, while promising, is only in its infancy.

To top it off, even the most deterministic genes—like BrCA1 and 2 for breast cancer and ApoE4 for Alzheimer’s—are very amenable to modification via lifestyle. Studies of twins who were separated at birth attest to the primacy of nurture over nature when it comes to health outcomes.

2) Environmental Pollution: A recent headline from Science Daily: “Exposure to air pollution increases risk of obesity.”That’s the take-home message from a study in which Duke University researchers exposed rats to regular air samples imported from Beijing, notorious for its pervasive smog.

After only 19 days, the lungs and livers of pregnant rats exposed to the polluted air were heavier and showed increased tissue inflammation. They were significantly heavier, despite being fed the same diet as control rats breathing normal air. They also had higher cholesterol and worsened insulin resistance—a prelude to diabetes. And their offspring weighed more, too.

The key to this surprising finding is inflammation (see below).

Environmental chemicals can also act as obesogens, because they disrupt endocrine pathways and damage fat-burning mitochondria.

3) Inflammation: Why is inflammation associated with weight gain? It’s actually a

vicious cycle: Inflammation begets weight gain, which in turn prompts more inflammation. It's well-documented that overweight individuals have more joint inflammation, heart and brain disorders, as well as higher C-reactive protein, a marker of inflammatory cytokines. Weight loss via a low-calorie diet has been shown to curb inflammation.

By what mechanism does inflammation promote obesity? Inflammation causes both leptin and insulin resistance which increase appetite and encourage fat storage. Inflammatory cytokines slow you down and interfere with caloric expenditure via exercise.

How to lower inflammation? I've enumerated twelve ways in a recent article, including via an anti-inflammatory diet, the use of fish oil and other nutraceuticals, and by getting adequate sleep.

4) Microbiome: The bugs that inhabit your gut may have a profound impact on whether or not you'll gain or retain weight. Transfer of intestinal bacteria from fat mice transforms thin mice into obese ones. While we haven't yet discovered the "Holy Grail" probiotic that will cause the pounds to melt away, researchers have identified certain candidate microbes.

The answer may lie in diet change. "Pre-biotics," food ingredients that encourage good bacteria to gain the upper hand, may ultimately prove more effective than a "poop pill." A bug called *Akkermansia muciniphila* that is associated with improved metabolic health flourishes with a calorie-restricted FODMAP diet. A new book called the Microbiome Diet explores these possibilities—we interviewed the author in a recent podcast.

Another intriguing prospect, just previewed in the New England Journal of Medicine is that we can rev our gut bacteria into fat-burning mode—by exposure to cold!

5) Allergy: "There's a direct connection between allergy and weight gain," explains Dr. Leo Galland in his soon to be released book "The Allergy Solution." I'm looking forward to interviewing Dr. Galland this April for the *Intelligent Medicine*podcast series.

Increased body fat is known to be associated with such allergic conditions as asthma, allergic rhinitis and eczema. Use of antihistamines has been shown to prompt weight gain.

Food allergens are a prime culprit. Elimination of allergy to wheat and grains may explain why Dr. William Davis' "Wheat Belly Diet" is so successful at facilitating weight loss above and beyond simple caloric restriction. Avoidance of common food allergens may also account for the success of the Paleo Diet in helping adherents lose weight, even while eating plentiful "allowed" foods.

6) Nutritional Deficiency: One of the unanticipated consequences of nutritional deficiencies is weight gain. To name but a few examples, deficiencies of key nutrients like B vitamins and magnesium can cause fatigue which impedes caloric expenditure; a low level of Co Q10 can slow mitochondrial activity; inadequacy of vitamin D is associated with obesity; insulin resistance worsens in the absence of sufficient Omega 3 fatty acids, magnesium, and chromium.

7) Hormones: Hard to detect sub-clinical hypothyroidism is a pervasive cause of weight gain; Polycystic ovarian syndrome (PCOS), common in women, drives fat accumulation; "Low T," decline of testosterone in middle-aged men, is associated with belly fat and loss of muscle mass; Estrogen dominance in pre-menopausal women

promotes fat build-up around hips, thighs, and upper arms; finally, insulin resistance, fueled by excess carbs, is a major stumbling block for dieters.

8) Stress: Our bodies mobilize in the face of external threats via adrenaline (short-term) and cortisol (long-term). Trouble is, when stress is chronic, we are flooded with excess cortisol. Cortisol raises blood sugar, and promotes insulin resistance and fat deposition. The medical use of synthetic designer cortisol—prednisone—is notorious for causing weight gain and diabetes. To a lesser extent, this exemplifies what high cortisol generated by chronic stress does to our bodies.

There are many time-tested ways of reducing stress including meditation, biofeedback, yoga, exercise, and cognitive behavioral therapy. And it’s worth bearing in mind that inadequate sleep —virtually epidemic in America—is a major driver of cortisol over-production.

As you can see, the reasons why stubborn weight sometimes arrives and stays—despite your best efforts—can be varied. If you find that you’ve gained unexplainable weight, or have a hard time shedding weight despite a move toward healthy diet and activity, it may be time to check in with your doctor and see if any of the above factors apply to you.